City Council Agenda

Thursday, April 10, 2025
6:00 PM
City Hall

Cell phones are to be turned off or placed on vibrate during the meeting. Please exit the Council Chambers before using your cell phone.

The agenda is prepared and distributed on Friday preceding the meeting to Council and news media. A work session is then held on the Tuesday preceding the regular meeting at 4:00 pm.

I. Call to Order
II. Pledge of Allegiance and Moment of Silent Prayer
III. Approval of Minutes
February 25, March 8, March 11, and March 14, 2025.

IV. Presentations

1. Presentation of a retirement plaque honoring Jackie Rushing for 43 years of dedicated service with the City of Concord.

Jackie Rushing has served for over 43 years in the City of Concord Electric Systems. He started in 1981 with Concord Light and Water on the tree crew and spent 28 years in the field as a lineman before moving into a management position as Electric Systems Coordinator II. Throughout his service with the City, he showed tremendous generosity and care for others, he was always quick to respond to calls for help, and he never hesitated to share his knowledge and expertise. Jackie deployed to at least 15 different communities across multiple states to help restore power following major storms and hurricanes. He also taught multiple ElectriCities basic and intermediate climbing schools and routinely led safety meetings and annual skills testing for coworkers. He was also actively involved with the North Carolina Association of Municipal Electric Systems and the Fallen Lineman Foundation. It is rare to meet someone who has dedicated their life not just to a single mission but to one company. His leadership, dedication, and teamwork will be greatly missed.

2. Presentation of a Proclamation recognizing April 18, 2025 as National Lineworker Appreciation Day in the City of Concord.

3. Recognition of the Electric Systems Department for receiving the RP3 award.

V. Unfinished Business
VI. New Business

A. Informational Items

1. Presentation from Miss Cabarrus County 2025, Jaime Logan.

B. Departmental Reports

1. Speed Limit Study Presentation

Periodically staff conducts speed limit studies in the City to assess whether or not speeding is actually occurring in particular areas. In this presentation, staff will explain the methodology that is used to gather information, how the data is interpreted, enforcement, and how we communicate any changes to the speed limit to the public.

2. Parks and Recreation Bonds update.

C. Recognition of Persons Requesting to be Heard

D. Public Hearings

1. Conduct a public hearing and consider approval of the Agency Annual Plan, which includes updates to the Policies governing the Public Housing Program.

The Housing Department staff is required to submit the Agency Annual Plan to the United States Department of Housing and Urban Development (HUD) annually, seventy-five (75) days before the start of the fiscal year. The plan must be available for public review for forty-five (45) days prior to adoption to allow for public comments on the proposed changes.

The plan has been ready for review since February 8, 2025. A public hearing must be held before adoption to gather public input on the proposed changes. Updated policies in this year's plan include: 1) conversion of Public Housing to Project-Based Rental Assistance or Project-Based Vouchers under RAD; and 2) continued collaboration with Planning and Neighborhood Development and WeBuild Concord to increase affordable market-rate rentals.

Additionally, the most recent revision of the 5-year plan, approved by HUD on August 28, 2024, continues to focus on infrastructure improvements, including HVAC and appliance upgrades, tree removal for hazard mitigation, unit abatement/turnarounds, and other unit enhancements.

Recommendation: Motion to accept the Agency Annual Plan, including the updated policies governing the Public Housing Program.

E. Presentations of Petitions and Requests

1. Consider renaming Fawn Circle SW (a private street) to Vic St. Pierre Pl SW. The street is located on the property of St. James the Greater Catholic Church and intersects with Manor Ave SW.

Mr. Mike Ford, a parishioner of St. James the Greater Catholic Church, along with other parishioners are requesting that Fawn Circle SW be renamed in honor of Victor Joseph St. Pierre, a longtime parishioner of the church. Mr. St. Pierre is a World War II veteran who has made a lasting impact in the community through years of selfless service. Now at 99 years of age, Mr. St. Pierre has embodied the values of faith, duty, and commitment by enriching the lives of many who have come to know him.

Recommendation: Motion to adopt an ordinance to rename Fawn Circle SW to Vic St. Pierre Pl SW.

2. Consider adopting a resolution of intent to schedule a public hearing on the matter of closing the right-of-way of an unopened +/- 30-foot-wide alley connecting Union St. S to Sunset Dr. SE and running parallel to Louise Dr. SE.

The proposal includes the abandonment of the right-of-way for a +/- 312-foot-long portion of alley that runs behind 4 Louise Dr. SE. The alley was never opened and is unimproved.

Stephen Bradley & Karen Bradley, owners of 4 Louise Dr. SE, filed the application. The other adjoining property owners are Renda & Albert Powell and Seth and Bethany Jean Micarelli. Each property owner will receive a portion of the alley being abandoned.

The General Statures require that the City post signs in two (2) places along the right-of-way, send copies of the approved resolution of intent to all neighboring owners after adoption, and advertise in the newspaper once a week for four (4) consecutive weeks. The notice requirement would allow the hearing to be conducted at the May 8, 2025 meeting.

Recommendation: Consider making a motion to adopt a resolution of intent to set a public hearing for May 8, 2025.

3. Consider approving an owner-occupied reconstruction of 133 Cypress Street for Ms. Elma Henderson and Ms. Joyce Redfern through a partnership with Habitat for Humanity Cabarrus in the amount of $192,295.

The City of Concord's mission within the HOME program is to aid low and moderate-income residents who need major housing rehabilitation. One avenue that staff uses to assist homeowners when repairs are so extensive and cost prohibitive is to demolish the existing home and construct a new home of roughly the same square footage. HUD will allow size changes to the new home if the existing home is determined to be inadequate per the local building code.

Ms. Henderson and Ms. Redfern's home is currently 1,260 square feet with significant foundation issues and major flooring issues due to water leaking from various plumbing and water supply lines, roof damage from leaking, grossly inadequate electrical system, inadequate bath facilities, and lack of safe heating. The size of the new house will only increase by 11 square feet to 1271 square feet to meet code requirements.

Staff will partner with Habitat for Humanity Cabarrus to reconstruct the home as their use of volunteers will reduce the cost. The household income is under 44% of area median income. At this level, they would repay 50% of the project cost resulting in a monthly payment of $277.48 with 0% interest for 30 years. A deed restriction will be placed on the property for the same 30 years. If approved, HOME funds would be used to complete with the cost related to relocation for the owners being included within the project costs. Staff will work with the residents to finalize all details related to their relocation needs. The reconstruction cost of $192,295 is estimated by Habitat based on current projects and includes estimated cost of demolition of the existing home.

Recommendation: Motion to award an owner-occupied reconstruction of 133 Cypress Street for Ms. Elma Henderson and Ms. Joyce Redfern through a partnership with Habitat for Humanity Cabarrus in the amount of $192,295.

4. Consider adopting a Resolution Giving Preliminary Approval to Issuance of Multifamily Housing Revenue Bonds for Norcutt Mill.

Norcutt Mill 2025, LLC, a Kentucky limited liability company, or another affiliated or related entity of Aventurine One, LLC (the "Company"), intends to provide affordable housing in the City. They have requested that the City assist it in financing the acquisition of the historic Norcutt Mill and the constructing, renovating, and equipping therein of a qualified residential rental project to be known as Norcutt Mill, consisting of 128 units and located at 31 White Street NW in the City (the "Development").

The housing bonds, when and if issued by the City, will be issued pursuant to Article 1 of Chapter 157 and Section 160D-1311(b) of the General Statutes of North Carolina and shall not be a debt of the State of North Carolina (the "State"), the City or any political subdivision thereof and none of the State, the City, or any political subdivision thereof shall be liable thereon, nor in any event shall such bonds be payable out of any funds or properties other than those of the City derived solely from payments made by the Borrower. The amount needing to be financed is estimated not to exceed $27,000,000 to provide all or part of the cost of the development.

Recommendation: Motion to adopt a Resolution Giving Preliminary Approval to Issuance of Multifamily Housing Revenue Bonds for Norcutt Mill.

5. Consider adopting a resolution authorizing an eminent domain action for a parcel located at located on the northeast quadrant of the intersection of George Lyles and Weddington Road.

This property is currently owned by Jolene P. Coble (50% Undivided Interest), Scott R. Needham (25% Undivided Interest), and Mark L. Needham (25% Undivided Interest). Acquisition of this property is

necessary for the construction of a gravity wastewater main as part of the project to eliminate the Laurel Park Pump Station. The permanent utility easement of 12,383 square feet or 0.284 acres is estimated to have a value of $42,643, and an appraisal has been ordered.

Recommendation: Consider making a motion to adopt a resolution authorizing an eminent domain action for a permanent utility easement for a gravity wastewater main located on the northeast quadrant of the intersection of George Lyles and Weddington Road.

6. Consider approving language to amend the deed restrictions for up to 6 units of the WeBuild project on Lincoln Street.

When the City transferred the Lincoln Street property to WeBuild, certain restrictions were placed on the property via deed restriction. One of the restrictions requires that at least 75% of the units sold or leased qualify as affordable housing but allows WeBuild to sell or lease up to 25% of the units at work force or market rate prices. The project consists of a total of 26 units and 6 of those are eligible for work force or market rate sale or lease. Any units chosen for work force or market rate lease of sale are at the sole discretion of WeBuild.

The proposed amendment to the deed restrictions will allow WeBuild to identify the specific unit chosen for work force or market rate lease or sale and memorialize that on the public record at the register of deeds. No amendment will be executed or filed until the specific unit is identified, and the amendment will be recorded at the time of or shortly prior to the closing of the chosen unit.

Recommendation: Motion to approve language to amend the deed restrictions for up to 6 units of the WeBuild project on Lincoln Street and authorized the City Attorney to have the amendment executed and given to the closing attorney at or shortly prior to the closing of the lease or sale of the unit.

7. Consider authorizing the City Manager to negotiate and execute a contract with CITI Inc. in the amount of $687,845 for water SCADA Integration and approve the attached budget amendment.

For the past 12 months, Water Resources has been working towards a SCADA (System Controls and Data Acquisition) system upgrade. The SCADA system is used to operate and interact with water plant and field components such as pumps, tanks, chemical feeds, etc. This system also handles alerting and the logging of historical data for later use. The current system is no longer upgradable and needs many changes to continue to meet our increasing data demands.

In February, an RFQ was released to identify potential vendors. CITI was selected based on their submittal and overall project plan. We vetted their other regional customers and received very positive feedback. An additional meeting was held with CITI and IT staff to make sure overall City IT requirements could be met. The project is expected to take 12-18 months to complete.

Recommendation: Motion to authorize the City Manager to negotiate and execute a contract with CITI Inc. for water SCADA Integration in the amount of $687,845 and approve the attached budget amendment.

8. Consider awarding a bid to Carolina Siteworks, Inc. for the sitework and grading at 1050 Vinehaven Dr. for construction of Substation N.

Site work and grading is necessary for the planned construction of Substation N. Sub N will be a 100kV delivery and 13kV distribution substation serving the northeastern part of Concord.

Civil engineering was completed and formal bids were received on March 18, 2025 with four respondents submitting proposals. All bids were evaluated for compliance with the specifications and for relevant project experience. The lowest bid was Carolina Siteworks, Inc. in the amount of $184,644. They have recently completed our Delivery 4/Sub Q and Sub V projects. Upon completion of a contract, the work is expected to take 90 days.

Recommendation: Motion to award a bid to Carolina Siteworks, Inc. for the sitework and grading at 1050 Vinehaven Dr. for construction of Substation N in the amount of $184,644.

9. Consider authorizing the City Manager to negotiate and execute a contract with J.D. Goodrum Company, Inc., for the construction of the J.E. "Jim" Ramseur Park, a part of the Group 1 bond projects.

The 28.6-acre park property sits along Cox Mill Road immediately north of Cox Mill Elementary School. The Plan features six pickleball courts and shelter, a splash pad, a large open lawn space and amphitheater, multiple playgrounds, small and large dog park areas, basketball courts, restrooms, pavilions and shelters, an outdoor environmental education area, greenway trail and significant walking trail and sidewalks, 272 vehicle parking spaces (10 accessible spaces), a maintenance building, and vehicular connections to both Cox Mill Road and the entrance driveway with Cox Mill Elementary School.

The project was bid under the formal bidding process, and four (4) bids were received and publicly read aloud on March 20, 2025. The lowest responsible bid was J.D. Goodrum Company, Inc., in the amount of $17,975,041.95. This amount is $2 million under the estimated budgeted amount.

Recommendation: Motion to authorize the City Manager to negotiate and execute a contract with J.D. Goodrum Company, Inc., in the amount of $17,975,041.95 for the construction of the Ramseur Park on Cox Mill Road.

10. Consider authorizing the City Manager to negotiate and execute a contract with Carolina Siteworks, Inc. for the construction of the Logan Recreation Center Parking Lot Expansion.

The project involves adding 18 new parking spaces to the existing parking lot at the Logan Recreation Center constructing a segmental retaining wall, implementing stormwater control measures (SCM), asphalt paving, and installing a new access from Lincoln Street.

The project was bid under the formal bidding process, and five (5) bids were received and publicly read aloud on March 27, 2025. The lowest responsible bid was Carolina Site Siteworks, Inc. in the amount of $346,358.65. This amount is $160,000 under the estimated budgeted amount.

Recommendation: Motion Authorizing the City Manager to negotiate and execute a contract with Carolina Siteworks, Inc. in the amount of $346,358.65 for the construction of the Logan Recreation Center Parking Lot Expansion.

11. Consider accepting a preliminary application from Ray D. Barnes & Amy B. Barnes.

In accordance with City Code Chapter 62, Ray D. Barnes & Amy B. Barnes have submitted a preliminary application to receive water service outside the City limits. The property is located at 5451 Flowes Store Rd., Concord NC. This .44 acre parcel is zoned county LDR and is located within Area B. The owners wish to build one new home and demolish the existing home. Sewer is not available to the parcel.

Recommendation: Motion to accept the preliminary application and have the owner proceed to the final application phase excluding annexation.

12. Consider accepting a preliminary application from Flowes Store LLC, Paul Goforth.

In accordance with City Code Chapter 62, Flowes Store LLC, Paul Goforth has submitted a preliminary application to receive water service outside the City limits. The property is located at 6300 and 6272 Flowes Store Rd., Concord NC. This 3.88 acre parcel is zoned county LDR and is located within Area B. The owners wish to build two new homes and are requesting 2 water services. Sewer is not available to the parcel.

Recommendation: Motion to accept the preliminary application and have the owner proceed to the final application phase excluding annexation.

13. Consider making appointments/reappointments to the Concord United Committee.

A list of those that are eligible for reappointment is attached. Rev. Bertram Hinton, Jr. and LaMarie Austin-Stripling do not wish to be reappointed; therefore, leaving two Co-chair positions vacant.

Recommendation: Motion to make appointments/reappointments to the Concord United Committee.

VII. Consent Agenda

A. Consider approving a License to Attach Banners to City of Concord Property to Conder Flag Company for the placement of temporary race banners on Bruton Smith Blvd. and Hwy 29.

Conder Flag Company has requested to place banners on City light poles on Bruton Smith Blvd. between I-85 and Hwy. 29 (Exit 49 area between Mecklenburg County and the Rocky River) to promote the Coca-Cola 600 race. The City will receive $15 for each attachment. As required, the North Carolina Department of Transportation has reviewed and approved the banner design. The applicant may install the banners no earlier than May 9, 2025 and must remove the banners no later than May 30, 2025.

Recommendation: Motion to approve a License to Attach Banners to City of Concord Property to Conder Flag Company for the placement of temporary race banners on Bruton Smith Blvd. and Hwy. 29.

B. Consider authorizing Concord-Padgett Regional Airport to apply for the FY24 Federal Aviation Administration Airport Improvement Program (AIP) Grant.

The Federal Aviation Administration-Airport Improvement Program provides aid to airport authorities for the purpose of planning, acquiring, constructing, or improving municipal, county and other publicly owned or controlled airport facilities. FY24 FAA AIP has allocated $1,715,932 in grant funds to be utilized for the North General Aviation A1 Taxilane Rehabilitation Project.

Recommendation: Motion to authorize Concord-Padgett Regional Airport to apply for the FY24 Federal Aviation Administration Airport Improvement Program (AIP) Grant.

C. Consider authorizing Concord-Padgett Regional Airport to apply for the Bipartisan Infrastructure Legislation Program (BIL) Grant Funding Year Two of Five.

Concord-Padgett Regional Airport is a recipient of a five-year BIL grant; and as in the 2024 fiscal year, the agency has again designated the City of Concord as a sub-recipient for current FY25 funding to be utilized for the Master Plan Update.

Recommendation: Motion to authorize Concord-Padgett Regional Airport to apply for the Bipartisan Infrastructure Legislation Program (BIL) Grant for FY25, Year Two of Five.

D. Consider accepting a communication board that will be donated for Dorton Park from the Channing's Joy Foundation.

The Channing's Joy Foundation was founded in 2022 by Channing's Mother Lauren. The foundation is dedicated to promoting inclusion and providing more resources to autistic families. The communication board is designed to support children who are non-speaking or have speech difficulties, offering them a vital tool to express themselves and engage with others in public places.

Recommendation: Motion to accept a donation that will consist of a communication board to be installed at Dorton Park.

E. Consider adopting an ordinance to temporarily close Cabarrus Ave. (SR 1002) for downtown events in 2025.

The City of Concord is sponsoring several events in downtown Concord such as the Art Walks on Union, Streetscape Grand Opening Block Party, Candy Crawl, Tree Lighting Ceremony, and the Concord Christmas Parade. To protect the safety of pedestrians during these events, staff are requesting to temporarily close Cabarrus Ave. (SR 1002).

Recommendation: Consider adopting an ordinance to temporarily close Cabarrus Ave. (SR 1002) for several downtown events in 2025.

F. Consider adopting the 2025 Regional Hazard Mitigation Plan.

Every 5 years, the Cabarrus-Stanly-Union Regional Hazard Mitigation Plan is updated by each County and participating municipalities.

In order to ensure critical funding and other hazard mitigation efforts remain available in the future, each county and municipality within the region are requested to adopt the plan by resolution.

Recommendation: Motion to adopt the 2025 update of the Cabarrus-Stanly-Union Regional Hazard Mitigation Plan.

G. Consider accepting an Offer of Dedication of utility easements and public rights-of-ways in various subdivisions.

In accordance with CDO Article 5, the following final plat and easements are now ready for approval: Subdivision Plat for 832 and 836 Kathryn Drive. Various utility easements and public rights-of-ways are offered by the owners.

Recommendation: Motion to accept the offer of dedication on the following plat and easements: Subdivision Plat for 832 and 836 Kathryn Drive.

H. Consider Accepting an Offer of Dedication of an access easement and approval of the maintenance agreement from Cabarrus County.

In accordance with the CDO Article 4, the following access easements and maintenance agreements are now ready for approval: SCM Maintenance & Access Easement to serve R. Brown McAllister Elementary School located at 505 Sunnyside Drive SE., Concord, NC 28025, Cabarrus County Property Identification Number (PIN): 5603-33-6923. The owners are offering access easements and SCM maintenance agreements.

Recommendation: Motion to approve the maintenance agreements and accept the offers of dedication to the following properties: Brown McAllister Elementary School located at 505 Sunnyside Drive SE., Concord, NC 28025, Cabarrus County Property Identification Number (PIN): 5603-33-6923.

I. Consider accepting an offer of infrastructure at The Mills at Rocky River Townhomes (Lots: 1-95), Smith Industrial Subdivision, Chick-Fil-A- Concord PKWY, Axial Bonds Farm Tract 1 and Tract 2, Christenbury Village Phase 4 (Bldg. 5 Lot 3), Lincoln Street Townhomes.

In accordance with CDO Article 5, improvements have been constructed in accordance with the City's regulations and specifications. The following are being offered for acceptance: Water Infrastructure - 23.00 LF of 12-inch WL, 1 12-inch Valves, 2344.00 LF of 8-inch WL, 4 8-inch Valves, 285.00 LF of 6-inch in LF WL, 2 6-inch Valves, 26.00 LF of 4-inch WL, 596.00 LF of 2-inch WL, 2 2-inch Valves, and 6 hydrants; Sanitary Sewer Infrastructure - 3159.00 LF of 8-inch SL, 20.00 LF of 6-inch, and 21 Manholes.

Recommendation: Motion to accept the offer of infrastructure acceptance in the following subdivisions and sites: The Mills at Rocky River Townhomes (Lots: 1-95), Smith Industrial Subdivision, Chick-Fil-A Concord PKWY, Axial Bonds Farm Tract 1 and Tract 2, Christenbury Village Phase 4 (Bldg. 5 Lot 3), Lincoln Street Townhomes.

J. Consider amending the Rates and Charges Schedule for the Aviation Department to add the penalties for airlines as approved in the Gate Management Program Policy and Procedures.

This addition to the Rates and Charges Schedule will be to add the penalties outlined in the Gate Management Program Policy and Procedures approved by City Council. The penalties relate to compliance with the policy and are enforceable on commercial flight activity utilizing the commercial service terminal that was not previously approved through the gate management program. The first financial penalty of $2,000 per unapproved arrival or departure is for a second offense. The second financial penalty of $3,500 per unapproved flight is for a third offense.

These penalties will go into effect immediately.

Recommendation: Motion to adopt the Rates and Charges Schedule update with the added penalties outlined in the Gate Management Program Policy and Procedures for the Aviation Department.

K. Consider approving a $2,500 donation from the Mayor's Golf Tournament Fund to the Pearls of Purpose Foundation and adopt a budget ordinance appropriating the donation.

If approved, the funds will be used to assist with scholarship grants for qualified Cabarrus County high school students.

Recommendation: Motion to approve a $2,500 donation from the Mayor's Golf Tournament Fund to the Pearls of Purpose Foundation and to adopt a budget ordinance appropriating the donation.

L. Consider approving a $2,500 donation from the Mayor's Golf Tournament Fund to Zion Hill AME Zion Church and to adopt a budget amendment appropriating the donation.

Zion Hill AME Zion Church requests $2,500 to assist with costs for Enlighten Summer Camp.

Recommendation: Motion to approve a $2,500 donation from the Mayor's Golf Tournament Fund to Zion Hill AME Zion Church and to adopt a budget amendment appropriating the donation.

M. Consider adopting an Aviation Capital Project Ordinance Airport Projects.

Aviation and Finance Staff have reviewed current projects and the allocation of funding among those projects. The attached amendment allocates the funding for those projects noted in the amendment.

Recommendation: Motion to adopt an Aviation Capital Project amendment.

N. Consider approving an update to Article 8.13 Computer Network, Email, and Internet Access Policy of the City's *Personnel Policies and Procedures.*

As technology continues to evolve, so do the risks and responsibilities associated with managing the City's computer network, email, and internet access. To ensure the security, efficiency, and integrity of our digital infrastructure, we are recommending an update to Article 8.13 Computer Network, Email, and Internet Access Policy to allow the creation of a City Manager Policy, City of Concord Acceptable Use & Technology Access, which will address the following key considerations:

- **Flexibility & Security:** A standalone policy allows for timely updates to address evolving cybersecurity threats and technology advancements.
- **Operational Efficiency:** Streamlines updates without requiring formal Council approval.
- **Clarity & Best Practices:** A standalone policy provides clear guidelines for employees and aligns with industry standards for IT governance.

This policy update is critical to protecting the City's digital assets, ensuring seamless operations, and reinforcing our commitment to responsible and secure technology use. Employees will receive training on

key policy changes, and IT staff will continue to provide resources and support to ensure successful implementation.

Recommendation: Motion to approve an update to Article 8.13 Computer Network, Email, and Internet Access Policy of the City's *Personnel Policies and Procedures.*

O. Consider acceptance of the Tax Office reports for the month of February 2025.

The Tax Collector is responsible for periodic reporting of revenue collections for the Tax Collection Office.

Recommendation: Motion to accept the Tax Office collection reports for the month of February 2025.

P. Consider Approval of Tax Releases/Refunds from the Tax Collection Office for the month of February 2025.

G.S. 105-381 allows for the refund and/or release of tax liability due to various reasons by the governing body. A listing of various refund/release requests is presented for your approval, primarily due to over-payments, situs errors and/or valuation changes.

Recommendation: Motion to approve the Tax releases/refunds for the month of February 2025.

Q. Receive monthly report on status of investments as of February 28, 2025.

A resolution adopted by the governing body on 12/9/1991 directs the Finance Director to report on the status of investments each month.

Recommendation: Motion to accept the monthly report on investments.

VIII. Matters not on the Agenda

Transportation Advisory Committee (TAC)
Metropolitan Transit Committee (MTC)
Concord/Kannapolis Transit Commission
Centralina Regional Council
Water Sewer Authority of Cabarrus County (WSACC)
WeBuild Concord
Public Art Commission
Concord United Committee

X. General Comments by Council of Non-Business Nature

XI. Closed Session (If Needed)

XII. Adjournment

*IN ACCORDANCE WITH ADA REGULATIONS, PLEASE NOTE THAT ANYONE WHO NEEDS AN ACCOMMODATION TO PARTICIPATE IN THE MEETING SHOULD NOTIFY THE CITY CLERK AT (704) 920-5205 AT LEAST FORTY-EIGHT HOURS PRIOR TO THE MEETING.

+Annual PHA Plan *(Standard PHAs and Troubled PHAs)*	**U.S. Department of Housing and Urban Development** **Office of Public and Indian Housing**	**OMB No. 2577-0226** **Expires: 03/31/2024**

Purpose. The 5-Year and Annual PHA Plans provide a ready source for interested parties to locate basic PHA policies, rules, and requirements concerning the PHA's operations, programs, and services, including changes to these policies, and informs HUD, families served by the PHA, and members of the public of the PHA's mission, goals and objectives for serving the needs of low- income, very low- income, and extremely low- income families.

Applicability. The Form HUD-50075-ST is to be completed annually by **STANDARD PHAs or TROUBLED PHAs**. PHAs that meet the definition of a High Performer PHA, Small PHA, HCV-Only PHA or Qualified PHA do not need to submit this form.

Definitions.

(1) ***High-Performer PHA*** – A PHA that owns or manages more than 550 combined public housing units and housing choice vouchers, and was designated as a high performer on both the most recent Public Housing Assessment System (PHAS) and Section Eight Management Assessment Program (SEMAP) assessments if administering both programs, or PHAS if only administering public housing.

(2) ***Small PHA*** - A PHA that is not designated as PHAS or SEMAP troubled, that owns or manages less than 250 public housing units and any number of vouchers where the total combined units exceed 550.

(3) ***Housing Choice Voucher (HCV) Only PHA*** - A PHA that administers more than 550 HCVs, was not designated as troubled in its most recent SEMAP assessment and does not own or manage public housing.

(4) ***Standard PHA*** - A PHA that owns or manages 250 or more public housing units and any number of vouchers where the total combined units exceed 550, and that was designated as a standard performer in the most recent PHAS or SEMAP assessments.

(5) ***Troubled PHA*** - A PHA that achieves an overall PHAS or SEMAP score of less than 60 percent.

(6) ***Qualified PHA*** - A PHA with 550 or fewer public housing dwelling units and/or housing choice vouchers combined and is not PHAS or SEMAP troubled.

A. PHA Information.

A.1

PHA Name: _City of Concord Housing Dept_____ **PHA Code**: _____
PHA Type: ☒ Standard PHA ☐ Troubled PHA
PHA Plan for Fiscal Year Beginning: (MM/YYYY): _____
PHA Inventory (Based on Annual Contributions Contract (ACC) units at time of FY beginning, above)
Number of Public Housing (PH) Units _174_____ Number of Housing Choice Vouchers (HCVs) _569____
Total Combined Units/Vouchers __743_____
PHA Plan Submission Type: ☒ Annual Submission ☐ Revised Annual Submission

Availability of Information. PHAs must have the elements listed below readily available to the public. A PHA must identify the specific location(s) where the proposed PHA Plan, PHA Plan Elements, and all information relevant to the public hearing and proposed PHA Plan are available for inspection by the public. At a minimum, PHAs must post PHA Plans, including updates, at each Asset Management Project (AMP) and main office or central office of the PHA. PHAs are strongly encouraged to post complete PHA Plans on their official website. PHAs are also encouraged to provide each resident council a copy of their PHA Plans.

The Public Hearing for the proposed plan will be held on April 10, 2025. The approved plan will be available at the Administrative Office

☐ **PHA Consortia**: (Check box if submitting a Joint PHA Plan and complete table below)

Participating PHAs	PHA Code	Program(s) in the Consortia	Program(s) not in the Consortia	No. of Units in Each Program	
				PH	HCV
Lead PHA:					

B. Plan Elements

B.1 **Revision of Existing PHA Plan Elements.**

(a) Have the following PHA Plan elements been revised by the PHA?

Y N
- ☐ ☒ Statement of Housing Needs and Strategy for Addressing Housing Needs
- ☐ ☒ Deconcentration and Other Policies that Govern Eligibility, Selection, and Admissions.
- ☐ ☒ Financial Resources.
- ☐ ☒ Rent Determination.
- ☐ ☒ Operation and Management.
- ☐ ☒ Grievance Procedures.
- ☐ ☒ Homeownership Programs.
- ☐ ☒ Community Service and Self-Sufficiency Programs.
- ☐ ☒ Safety and Crime Prevention.
- ☐ ☒ Pet Policy.
- ☐ ☒ Asset Management.
- ☐ ☒ Substantial Deviation.
- ☐ ☒ Significant Amendment/Modification

(b) If the PHA answered yes for any element, describe the revisions for each revised element(s):

(c) The PHA must submit its Deconcentration Policy for Field Office review.

B.2 **New Activities.**

(a) Does the PHA intend to undertake any new activities related to the following in the PHA's current Fiscal Year?

Y N
- ☐ ☒ Hope VI or Choice Neighborhoods.
- ☐ ☒ Mixed Finance Modernization or Development.
- ☒ ☐ Demolition and/or Disposition.
- ☐ ☒ Designated Housing for Elderly and/or Disabled Families.
- ☐ ☒ Conversion of Public Housing to Tenant-Based Assistance.
- ☒ ☐ Conversion of Public Housing to Project-Based Rental Assistance or Project-Based Vouchers under RAD.
- ☐ ☒ Occupancy by Over-Income Families.
- ☐ ☒ Occupancy by Police Officers.
- ☐ ☒ Non-Smoking Policies.
- ☒ ☐ Project-Based Vouchers.
- ☒ ☐ Units with Approved Vacancies for Modernization.
- ☒ ☐ Other Capital Grant Programs (i.e., Capital Fund Community Facilities Grants or Emergency Safety and Security Grants).

(b) If any of these activities are planned for the current Fiscal Year, describe the activities. For new demolition activities, describe any public housing development or portion thereof, owned by the PHA for which the PHA has applied or will apply for demolition and/or disposition approval under section 18 of the 1937 Act under the separate demolition/disposition approval process. If using Project-Based Vouchers (PBVs), provide the projected number of project-based units and general locations, and describe how project basing would be consistent with the PHA Plan.

B.3 **Progress Report.**

Provide a description of the PHA's progress in meeting its Mission and Goals described in the PHA 5-Year and Annual Plan.

B.4	**Capital Improvements.** Include a reference here to the most recent HUD-approved 5-Year Action Plan in EPIC and the date that it was approved. **The most recent revision to the 5-year plan was approved by HUD on 08/29/2024. We continue to focus on infrastructure improvements, HVAC and appliance replacements, tree removal for hazard mitigation, vacancy turnaround and modernization.**
B.5	**Most Recent Fiscal Year Audit**. (a) Were there any findings in the most recent FY Audit? Y N ☒ ☐ (b) If yes, please describe:
C.	**Other Document and/or Certification Requirements.**
C.1	**Resident Advisory Board (RAB) Comments.** (a) Did the RAB(s) have comments to the PHA Plan? Y N ☐ ☐ (b) If yes, comments must be submitted by the PHA as an attachment to the PHA Plan. PHAs must also include a narrative describing their analysis of the RAB recommendations and the decisions made on these recommendations.
C.2	**Certification by State or Local Officials.** Form HUD 50077-SL, *Certification by State or Local Officials of PHA Plans Consistency with the Consolidated Plan*, must be submitted by the PHA as an electronic attachment to the PHA Plan.
C.3	**Civil Rights Certification/ Certification Listing Policies and Programs that the PHA has Revised since Submission of its Last Annual Plan.** Form HUD-50077-ST-HCV-HP, *PHA Certifications of Compliance with PHA Plan, Civil Rights, and Related Laws and Regulations Including PHA Plan Elements that Have Changed*, must be submitted by the PHA as an electronic attachment to the PHA Plan.
C.4	**Challenged Elements.** If any element of the PHA Plan is challenged, a PHA must include such information as an attachment with a description of any challenges to Plan elements, the source of the challenge, and the PHA's response to the public. (a) Did the public challenge any elements of the Plan? Y N ☐ ☒ If yes, include Challenged Elements.
C.5	**Troubled PHA.** (a) Does the PHA have any current Memorandum of Agreement, Performance Improvement Plan, or Recovery Plan in place? Y N N/A ☐ ☒ ☐ (b) If yes, please describe:

D.	Affirmatively Furthering Fair Housing (AFFH).

D.1 **Affirmatively Furthering Fair Housing (AFFH).**

Provide a statement of the PHA's strategies and actions to achieve fair housing goals outlined in an accepted Assessment of Fair Housing (AFH) consistent with 24 CFR § 5.154(d)(5). Use the chart provided below. (PHAs should add as many goals as necessary to overcome fair housing issues and contributing factors.) Until such time as the PHA is required to submit an AFH, the PHA is not obligated to complete this chart. The PHA will fulfill, nevertheless, the requirements at 24 CFR § 903.7(o) enacted prior to August 17, 2015. See Instructions for further detail on completing this item.

Fair Housing Goal:

Describe fair housing strategies and actions to achieve the goal

We will host workshops on Fair Housing in partnership with the City of Concord's Planning and Neighborhood Development Department. Participants will include landlords and property managers with speakers from the North Carolina Fair Housing Investigations Department and the Office of Administrative Hearings.

Fair Housing Goal:

Describe fair housing strategies and actions to achieve the goal

We will work with community partners to ensure that our programs are marketed to include populations that are facing homelessness. The Housing Department meets with Cabarrus County Housing Collaborative which focuses on expanding housing access in our county.

Fair Housing Goal:

Describe fair housing strategies and actions to achieve the goal

We will work ensure that services provided by the City of Concord Housing Department allow communication with individuals regardless of their ability to speak English by following the City of Concord's Language Access Plan.

B.2 (b)

HOUSING AUTHORITY OF THE CITY OF CONCORD

RAD CONVERSION FOR ANNUAL PLAN

The following information is to meet requirements of the RAD-Specific portion of the PHA Plan:

The Housing Authority of the City of Concord will convert a total of 46 units housed in a family development known as Wilkinson Homes, included in AMP NC008000001 from public housing to project-based vouchers using the Rental Assistance Demonstration (RAD) program.

The current unit mix is as follows:

Bedrooms	No. Of Units
1	13
2	21
3	10
4	2

No de minimis unit reductions, unit reductions that are exempt from the de minimis cap, or changes in the bedroom distribution of units will be proposed as part of the conversion.

The Housing Authority of the City of Concord will convert to project-based vouchers (PBV) in the RAD program with its already adopted set of policies in the Section 8 Administrative Plan to govern eligibility, admission, selection, and occupancy of units at Wilkinson Homes after it has been converted. The conversion will include any waiting list preferences that will be adopted for the Covered Project as well as the Resident Rights and Participation, Tenant Protections for residents stated in Section 1.6, Attachment 1B of this Notice and the RAD Fair Housing, Civil Rights, and Relocation Notice - Notice H 2016-17, PIH 2016-17 (HA). (**See Table 1 below** for more specific guidance).

No transfer of assistance will be used for the conversion and all RAD project-based vouchers will be held at the current property.

The Housing Authority of the City of Concord is not currently under any voluntary compliance agreement, consent order or consent decree or final judicial ruling or administrative ruling or decision. The PHA has assurance that the conversion activities will not have a negative impact on the compliance with the guidelines.

The Housing Authority of the City of Concord will make significant changes to the building

structures and will be relocating current residents within Wilkinson Homes. The Wilkinson Homes property, along with all activities related to the RAD conversion will comply with Section 5.2 of the RAD Fair Housing, Civil Rights, and Relocation Notice (Notice H 2016-17/PIH 2016-17 (HA)) and all applicable site selection and neighborhood reviews.

The Housing Authority of the City of Concord will comply to any additional required information and certifications necessary to submit a the PHA Plan, including Resident Advisory Board comments and responses, challenged elements, and all required certifications.

The Housing Authority of the City of Concord is not a Moving to Work agency.

Additionally, in accordance with 24 CFR Part 903, during the PHA Plan submission the housing authority shall notify the public that the current and future Capital Fund Program Grants Budgets will be reduced as a result of any projects converting to RAD.

The public review of the documents in the plan as well as the advertised public hearing will allow the public to hear that the current and future capital funds will be used for the purposes of improving the property and paying for the RAD conversion.

All allocated capital funds will be used to fund an appropriate replacement reserve and/ or operating reserve in the RAD conversion.

The PHA does not have CFFP or EPC debt.

The PHA intends to convert all of the remaining units in the AMP to project based vouchers using a public housing repositioning option of Section 18 or Section 22 or RAD.

Table 1: List of RAD Program Elements Affecting Resident Rights and Participation, Waiting List and Grievance Procedures for PBV and PBRA

Below, please find a table listing out each of the provisions affecting residents' rights and participation, waiting list and grievance procedures that must be included in a PHA's Significant Amendment. The table lists out the provisions applicable to the type of conversion (PBV or PBRA) that the PHA is proposing. This list is not a substitute for providing a copy of the relevant tenant protections listed below. PHAs should either provide reference to these tenant protections or place the tenant protections cited in this table directly into their Plan submission.

Project Based Voucher Requirements	Project Based Rental Assistance Requirements (Section 1.7 of Notice H 2019- xx, PIH 2019-xx; and Notice H 2016-17, PIH 2016-17)
Tenant Protections Under Notice H 2016-17; PIH 2016-17	
1. Right to Return and Relocation Assistance	1. Right to return and Relocation Assistance
Tenant Protections Under Section 1.6.C (PBV) or Section 1.7.B (PBRA)	
1. No rescreening of tenants upon conversion	1. No rescreening of tenants upon conversion
2. Under-Occupied Unit	2. Under-Occupied Unit
3. Phase-in of tenant rent increase	3. Phase-in of tenant rent increase
4. FSS and ROSS-SC programs	4. FSS and ROSS-SC programs
5. Resident Participation and Funding	5. Resident Participation and Funding
6. Termination notification	6. Termination notification
7. Grievance process	7. Grievance process
8. Earned Income Disregard.	8. Earned Income Disregard
9. Jobs Plus	9. Jobs Plus

10. When Total Tenant Payment Exceeds Gross Rent.	10. When Total Tenant Payment Exceeds Gross Rent.
Tenant Protections Under Section 1.6.D (PBV) or Section 1.7.C (PBRA)	
1. Establishment of Waiting List	1. Establishment of Waiting List
2. Choice-Mobility	2. Choice-Mobility

By way of summary and not as a modification of the program requirements set forth in the Notice provisions referenced, please note that the foregoing tenant protections for RAD PBV residents apply to non-RAD PBV residents of the same Covered Project with the exception of Choice Mobility. Standard PBV Choice Mobility requirements apply to non-RAD PBV residents.

B.2 (b)

Demolition and/or Disposition: The City of Concord Housing Department's City Council (Board) voted and agreed on April 14, 2022 to proceed the process of exploring the repositioning of all public housing communities. Concord has a total of 174 public housing units across four (4) communities: Wilkinson Homes (46 units), Mary Chapman Homes (60 units), Logan Homes (46 units) and Larkhaven (22 units). Inventory consists of thirty-three (33) one-bedroom units, sixty-two (62) two-bedroom units, sixty-nine (69) three-bedroom units, and ten (10) four-bedroom units. The majority of these units over 50 years old and are need of significant upgrades/repairs despite staff's best maintenance efforts.
On 08/01/2022, the City of Concord solicited requests for qualifications (RFQ #2545) for an asset repositioning consultant. The scope of work included the following:

The firm selected to provide the consulting services described in this RFQ shall be qualified to provide expert advice to CHD on the following:

Perform a repositioning feasibility analysis of the Asset Management Project (AMP) to determine if any or all of the properties are candidates for conversion under repositioning. The analysis will compare multiple financing structures to convert the properties under repositioning and include a recommendation of the optimal financing structure for each property or property grouping. The assessment should be completed in the following order:

The units are divided over four communities: Wilkinson Homes, Mary Chapman Homes, Logan Homes and Larkhaven. Inventory consists of 33 one-bedroom units, 62 two-bedroom units, 69 three-bedroom units and 10 four-bedroom units. There are no five-bedroom options for larger families. Work will begin at the Wilkinson Homes community, move to the Logan Homes and Mary Chapman communities and lastly addressing the Larkhaven community.

For the public housing portfolio, the Concord Housing Department is requesting the following information:

a. Estimate the long-term financial impact of the repositioning conversion on CHD.

b. Recommend other sources of financing (Low Income Housing Tax Credit, bonds, loans, Energy grants, Federal Home Loan Bank, HUD insured loans or tax-exempt bonds, conventional loans, state housing development funds, Community Development Block Grant, New Markets Tax Credits, HUD Special Applications Center Demolition/Disposition, FHA financing, etc.) to perform rehabilitation activities of the property and capitalize reserves.

c. Make recommendations as to the structuring of the project as well as the ownership structure to maximize CHD's ownership and control.

d. Prepare a detailed analysis on the impact a full or partial repositioning conversion will have on all Housing Department staffing, as needed. Analysis

shall include workforce needs under a conversion, and the impact conversion will have on all departments. Assist in identifying training and capacity development needs.

e. Identify roles, responsibilities, and contractual arrangements of development and REPOSITIONING conversion partners. Identify any additional development team roles and suggest strategy for procurement of other team roles.

f. Deliver to CHD an assessment/feasibility study of all units.

On December 22, 2022 the City of Concord selected Selenium Consulting Partners to serve as the asset repositioning consultant for the City on this project. Their work has not yet begun, so a detailed analysis regarding demolition and/or disposition plans as well as repositioning structure (Section 18, Section 21, RAD) cannot be provided at this time. Our plans, pending consultant review, do include the potential demolition of Wilkinson Homes, and constructing new units on site with increased density to further meet the housing needs of our community. Plans for the remaining public housing communities may very well include demolition or rehabilitation – again, pending consultant review and recommendation. This process will require resident feedback and other elements in accordance with HUD regulations.

Funding Source: The full array of potential funding sources are unknown at this time, pending consultant review. Some funding sources we are targeting include City affordable housing funds, ARPA, CDBG, tax credits, state and federal grants/funds, legislative appropriations, private partners, and loans.

Project Based Vouchers: The Housing Dept will explore project-basing a portion of its tenant-based vouchers at newly constructed LITC properties in Cabarrus County to increase the supply of affordable housing.

Conversion of Public Housing to Project-Based Rental Assistance or Project-Based Vouchers under RAD: See above

Units with Approved Vacancies for Modernization

The City of Concord Housing Department will request approval from HUD for units that need to be modernized during unit turnaround. Most of this modernization will address plumbing issues, updating kitchen cabinetry and countertops and new appliances.

B.3

Progress Report

Public Housing Goals:

1. Revitalization of the Wilkinson Community to expand affordable housing.

   The City of Concord commissioned an affordable housing study in 2019 that identified a need for 3,000 new affordable housing units over the next 10-15 years. That study led to the City creating a non-profit, WeBuild Concord, to partner with the City to enhance and expand our affordable housing efforts. The Wilkinson community presents a wonderful opportunity to revitalize existing housing stock while doubling site density, potentially creating a true transitional community with a variety of housing types. The City has hired Selenium Consulting Partners to assist us with an evaluation of this community to determine if repositioning is appropriate and if so, what structure is best. Resident feedback and engagement will be a critical component of this evaluation.

   The Housing Department continues to work with Selenium Consulting Partners on the repositioning of Wilkinson Homes. We applied for and received a Commitment to Enter into a Housing Assistance Payment (CHAP) on January 23, 2024. We have held several resident meetings to provide updates on the progress of the project. Residents continue to be engaged with questions and comments. We will begin working with DELCK Consulting on the relocation process. DELCK completed their relocation assessment of families in the Wilkinson Homes development

   In the upcoming year, we plan to issue an RFQ for Architectural and Engineering Services to assist in the development of a Master Plan for the site. The consultant will also finalize and submit financing plans.

Section 8 Goals:

1. Continue to work with Planning and Neighborhood Development and WeBuild Concord on building more affordable market rate rentals.

   The Executive Director of the Housing Department continues to serve on the board of directors for WeBuild Concord in an effort to enhance collaboration efforts between the City and the non-profit. WeBuild recently completed a 26-unit townhome community adjacent to our property. Sin of those units are eligible for workforce housing. They have set aside one of the rental units for participation in our HCV program. The Planning and Neighborhood Development Department and the Housing Department also continue to collaborate on opportunities. These efforts will continue in the coming year.

2. Solicit new landlords through educational workshops on how to become a Section 8 Landlord

   The City continues to host landlord and property manager workshops at least twice per year.

3. Increasing Utilization
   The City of Concord has established a utilization plan for regularly scheduled applicant eligibility update meetings and voucher issuance briefings. We have updated our Payment Standards based on recent market data for rentals in Cabarrus County to increase voucher holder opportunity to be successful in leasing.

B.5 Most Recent Financial Audit

See attached Schedule of Findings and Questioned Costs for the year ended June 30, 2024

See attached Corrective Action Plan that has been submitted to and approved by auditor.

CITY OF CONCORD, NORTH CAROLINA

SCHEDULE OF FINDINGS AND QUESTIONED COSTS
FOR THE YEAR ENDED JUNE 30, 2024

3. Federal Award Findings and Questioned Costs (continued)

Finding: 2024-002

U.S. Department of Housing & Urban Development
Program Name: Housing Voucher Cluster
AL Number: 14.871

Material Non-Compliance
Material Weakness, Special Tests and Provisions

Criteria: In accordance with 24 CFR sections 982.158(d) and 982.404, units under housing assistance payment (HAP) contract that fail to meet Housing Quality Standards (HQS), the Public Housing Authority (PHA) must require the owner to correct any life threatening HQS deficiencies within 24 hours after the inspections and all other HQS deficiencies within 30 calendar days or within a specified PHA-approved extension. If the owner does not correct the cited HQS deficiencies within the specified correction period, the PHA must stop HAPs beginning no later than the first of the month following the specified correction period or must terminate the HAP contract.

Condition: The City did not follow procedures to ensure that the HQS were corrected or subsequent procedures to stop HAP were not enforced.

Context: Of the 130 failed inspections during the current year, we examined 26 and determined that 22 (85% valued at $110,332) failed inspections were not corrected or the HAP were not stopped timely.

Effect: Owner could receive benefits for which they are not eligible.

Cause: Lack of proper internal control over HQS enforcement.

Questioned Cost: In accordance with 2 CFR 200, auditors are required to report known questioned costs when likely questioned costs are greater than $25,000. The sample results identified $110,332 in known questioned costs.

Recommendation: Management should implement controls to ensure that HQS enforcement procedures are followed timely.

Views of Responsible Officials and Planned Corrective Actions: The City agrees with this finding. Please refer to the Corrective Action Plan section of this report.

CITY OF CONCORD, NORTH CAROLINA

SCHEDULE OF FINDINGS AND QUESTIONED COSTS
FOR THE YEAR ENDED JUNE 30, 2024

3. **Federal Award Findings and Questioned Costs (continued)**

Finding: 2024-003

U.S. Department of Housing & Urban Development
Program Name: Public Housing Operating Fund
AL Number: 14.850

Material Weakness, Eligibility

Criteria: In accordance with 2 CFR 200, management should have an adequate system of internal control procedures in place to ensure that applicants have all required documentation in their file. In accordance with 24 CFR Part 5 Subpart F, the City must maintain documentation to support tenant eligibility.

Condition: The City did not follow procedures to ensure the proper eligibility determination were made and documented.

Context: Of the 180 applicants during the current year valued at $495,432, we examined 36 (valued at $99,685) and determined that 2 (6%) applicants did not have properly calculated resources. Upon further review and recalculation, the two applicants were deemed eligible.

Effect: Participants could receive benefits for which they are not eligible.

Cause: Weakness in implementation of controls over eligibility procedures.

Questioned Cost: None. This finding represents an internal control issue; therefore, questioned costs are not applicable.

Recommendation: Tenant files should be reviewed to verify that calculations are accurate, and all required documentation has been obtained before approving benefits.

Views of Responsible Officials and Planned Corrective Actions: The City agrees with this finding. Please refer to the Corrective Action Plan section of this report.

CITY OF CONCORD, NORTH CAROLINA

SCHEDULE OF FINDINGS AND QUESTIONED COSTS
FOR THE YEAR ENDED JUNE 30, 2024

3. **Federal Award Findings and Questioned Costs (continued)**

Finding: 2024-004

U.S. Department of Housing & Urban Development
Program Name: Public Housing Operating Fund
AL Number: 14.850

Non-Material Non-Compliance
Significant Deficiency, Special Tests and Provisions

Criteria: In accordance with 24 CFR 964.150, when tenant participation funds are provided to a Public Housing Authority (PHA), the PHA must provide those funds to duly elected resident councils. Funding provided by a PHA to a duly elected resident council may be made only under a written agreement between the PHA and the resident council that includes a resident council budget. The agreement must require the local resident councils to account to the PHA for the use of the funds and permit the PHA to inspect and audit the resident council's financial records related to the agreement.

Condition: The City did not follow procedures to ensure compliance of tenant participation fund requirements.

Context: The tenant participation fund agreement was not current and expired in 2018. We sampled 7 expenditure and supporting documentation reported to the PHA to determine if resident council expenditure is consistent with the resident council budget. We noted that 4 (58%) expenditures had proper supporting documentations but were not listed in the resident council budget.

Effect: Expenditure made that are not consistent with the resident council budget.

Cause: Lack of proper internal control over tenant participation funds.

Questioned Cost: In accordance with 2 CFR 200, auditors are required to report known questioned costs when likely questioned costs are greater than $25,000. Likely questioned costs do not exceed $25,000.

Recommendation: Management should obtain a current agreement and implement controls to ensure that tenant participation funds are in place and properly accounted for.

Views of Responsible Officials and Planned Corrective Actions: The City agrees with this finding. Please refer to the Corrective Action Plan section of this report.

3. Federal Award Findings and Questioned Costs

Finding: 2024-02

Name of Contact Person: Della Robinson, Housing Director

Corrective Action: Management has created a new Inspection Coordinator position that is responsible for the HCV inspection process. This position will report monthly on the status of scheduled inspections. The Housing Manager will be responsible to ensure that HAP payments are abated for units that do not meet inspection requirements.

Proposed Completion Date: November 5, 2024

Finding: 2024-003

Name of Contact Person: Della Robinson, Housing Director

Corrective Action: The Housing Manager will complete quality control file reviews from a random sampling of applicant files to ensure that they contain all required documentation for eligibility determination. An external agency will be hired to conduct a complete a full file audit of active files.

Proposed Completion Date: June 30, 2025

Finding: 2024-004

Name of Contact Person: Della Robinson, Housing Director

Corrective Action: An agreement will be revised and updated in accordance with regulations. A budget will be adopted by the duly elected resident council for the use of the resident participation funds.

Proposed Completion Date: November 14, 2024

Capital Fund 5 Year Plan

Years 2025-2029

Prepared:

Activity	2025	2026	2027	2028	2029	5YP Total	Prev. Cap Funds for Project	Total Project
General Operations -Operations	89,513.00	148,513.00	297,358.00	108,868.00	96,368.00	740,620.00	67,022.18	807,642.18
Loan Payment (Maint. Bldg-Operations						-	450,592.62	450,592.62
Tree Trimming/Removal	15,000.00	15,000.00	5,000.00	15,000.00	20,000.00	70,000.00	30,900.00	100,900.00
Appliances	30,000.00	35,000.00	35,000.00	35,000.00	35,000.00	170,000.00	81,568.88	251,568.88
Lark Ct. Kitchen/Bathroom Renovation	57,000.00	57,000.00				114,000.00		114,000.00
Water Plumbing Project	28,855.00	26,355.00				55,210.00	102,850.36	158,060.36
Plumbing (Drainline updgrades)	20,000.00	20,000.00	17,500.00	17,500.00	20,000.00	95,000.00		95,000.00
HVAC Replacement	71,500.00	55,000.00	40,000.00	44,000.00	35,000.00	245,500.00	167,569.62	413,069.62
HVAC Preventative Maintenance	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	75,000.00		75,000.00
Unit Turnaround/Abatement	50,000.00	50,000.00	50,000.00	55,000.00	65,000.00	270,000.00	363,380.76	633,380.76
Foundation Repairs						-	75,712.53	75,712.53
Larkhaven Playground Replacement	45,000.00					45,000.00		45,000.00
Roof Repairs	15,000.00	15,000.00	15,000.00	15,000.00	30,000.00	90,000.00	15,800.00	105,800.00
Larkhaven Exterior Upgrades (replace columns, gutter repairs, paint front doors)	38,000.00	38,000.00				76,000.00	44,700.00	120,700.00
Maintenance Bldg-Shelving-				11,000.00		11,000.00	8,500.00	19,500.00
Kitchen Cabinet Replacement				20,000.00	20,000.00	20,000.00		20,000.00
Site Improvements- Landscaping				15,000.00	15,000.00	15,000.00		15,000.00
Development- RAD				100,000.00	100,000.00	100,000.00		100,000.00
Insulation				25,000.00	25,000.00	25,000.00		25,000.00
Technologie improvements (Upgrade Tablets for HAB, HAB Software Update, Conf/Training room tech updates)-Operations	6,500.00	6,500.00	6,500.00	5,000.00	5,000.00	29,500.00		29,500.00
Admin Office-Repairs/Upgrades -Operations	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	50,000.00	2,754.00	52,754.00
Total per Grant	491,368.00	491,368.00	491,358.00	491,368.00	491,368.00	2,296,830.00	1,411,350.95	3,708,180.95
Operations Total	106,013.00	165,013.00	313,858.00	123,868.00	111,368.00	820,120.00	520,368.80	1,340,488.80

Meeting Date
April 10, 2025

Street Renaming Staff Report

According to the Code of Ordinances, the City Council assigns official street names to public and private streets.

Mr. Mike Ford, a parishioner of St James The Greater Catholic Church, along with other parishioners, are requesting that Fawn Cir SW be renamed in honor of Victor Joseph St Pierre, a longtime parishioner of the church. Mr. St Pierre is a World War II veteran who has made a lasting impact in the community through years of selfless service. Now at 99 years of age, Mr. St Pierre has embodied the values of faith, duty, and commitment by enriching the lives of many who have come to know him.

The petition for renaming the street was signed by Bishop Michael T. Martin of the Diocese of Charlotte.

City staff in the Planning & Neighborhood Development Department have reviewed this request and do not see any 911 or emergency response problems that would occur because of the renaming. The proposed street type of Circle (Cir) would need to be changed to Place (Pl) since the Technical Standards Manual indicates that Place would apply to dead-end streets that run in a north-south direction.

There are two buildings accessed by the private street – Our Lady of Guadalupe Hall (addressed off Manor Ave SW) and Gill Hall (addressed off Fawn Cir SW). The primary church building at St James The Greater Catholic Church is accessed by a private drive which connects to Manor Ave SW, and therefore, would not be related to this street name change. The church owns all the property that is served by the private street, and only one address would be affected by this street name change (Gill Hall, which is owned and operated by the church).

Concord
NORTH CAROLINA
High Performance Living

Request for Naming or Renaming a City Street

Date 2-21-25

Applicant Name: St James Catholic Church
Company (if applicable): _____
Address: 980 Fawn Circle
_____
City: Concord State NC Zip Code 28025
Phone Number: 704-720-0600
E-Mail Address: MariaA@saintjamescatholic.org

For subdivisions and other plats

Check One: Final Plat ____ Preliminary Plat _____
Name of Plat: _____
Phase: _____
Requested Street Names (You may also attach a separate sheet containing names):

_____ _____
_____
_____
_____
_____

For a public or private street

Check one: Public street ____ Private street X
Check one: Naming (street does not currently have a name) ____ Renaming X
Existing name: Fawn Circle SW
Requested name: Vic St Pierre Cir SW
Reason for request:
The proposed street renaming honors Vic St Pierre, a longtime parishioner and dedicated veteran who has made a lasting impact in our community. Through years of selfless service, Vic embodied the values of faith, duty and commitment, enriching the lives of those around them.

NOTE: Petition for renaming of City-maintained streets requires a minimum of 80% of the property owners that front or take access from the subject street, sign the petition. Petitions with less than 80% signatures will not be accepted.

Planning & Neighborhood Development
35 Cabarrus Ave W • P. O. Box 308 • Concord, NC 28025
Phone (704) 920-5146 • Fax (704) 920-6962 • www.concordnc.gov

Concord
NORTH CAROLINA
High Performance Living

Request for Naming or Renaming a City Street

Property Owner(s) (Printed Name): Martin Michael T - Bishop Roman Catholic Diocese
Affected Property Address or PIN: 880 Fawn Circle SW PIN 55393893260000
Property Owner(s) Signatures: [signature]

Property Owner(s) (Printed Name): _____
Affected Property Address or PIN: _____
Property Owner(s) Signatures: _____

Property Owner(s) (Printed Name): _____
Affected Property Address or PIN: _____
Property Owner(s) Signatures: _____

Property Owner(s) (Printed Name): _____
Affected Property Address or PIN: _____
Property Owner(s) Signatures: _____

Property Owner(s) (Printed Name): _____
Affected Property Address or PIN: _____
Property Owner(s) Signatures: _____

Property Owner(s) (Printed Name): _____
Affected Property Address or PIN: _____
Property Owner(s) Signatures: _____

Property Owner(s) (Printed Name): _____
Affected Property Address or PIN: _____
Property Owner(s) Signatures: _____

Print this page as many times as needed to accommodate all necessary signatures. Properties with multiple owners require that each party sign the petition. (Example: 123 City Street, owned by John Smith and wife Jane Smith)

Planning & Neighborhood Development
35 Cabarrus Ave W • P. O. Box 308 • Concord, NC 28025
Phone (704) 920-5146 • Fax (704) 920-6962 • www.concordnc.gov

CN-GIS-2025-0001

Petition for Closure of Right-of- Way

(Type or print in black ink)

Applicant: Stephen L. Bradley & wife, Karen R. Bradley Date: February 5, 2025

Applicant's address: 4 Louise Drive SE, Concord, North Carolina 28025

Applicant's telephone: Home: 704-363-3392 Work: 704-363-3392

Location of right-of-way proposed for closure (name, paved, unpaved, etc.):

150 yards south of intersection of Louise Dr., SE/Union St., S, there is an unopened parcel (Canal Street) running N/NE from Union St., S. over to Sunset Drive SE. The area in question is approximately .22 acres of land.

List all adjoining property owners, other than applicant (use additional page, if necessary):

Name: Renda B Powell & husband, Albert W. Powell
Address: 239 Union Street S.
Concord, North Carolina 28025

Name:
Address:

Name: Seth Micarelli & wife, Bethany Jean Micarelli
Address: 270 Sunset Drive SE
Concord, North Carolina 28025

Name:
Address:

Reason for Petition for Closure of Right-of-Way: The ally in question is unused based on the current topography and does not provide any access for utilities, access to adjacent properties, or transition down to Sunset Dr. SE. All three property owners adjacent to the ally have agreed to this petition and will divide the parcel equally between all parties. The closure will not negatively impact public access or essential services and will allow adequate maintenance of this area.

Signature(s) of applicant(s): Stephen L Bradley Date: 3/5/2025

Karen R Bradley Date: 3/5/2025

Date:

Date:

Required Attachments/Submittals:

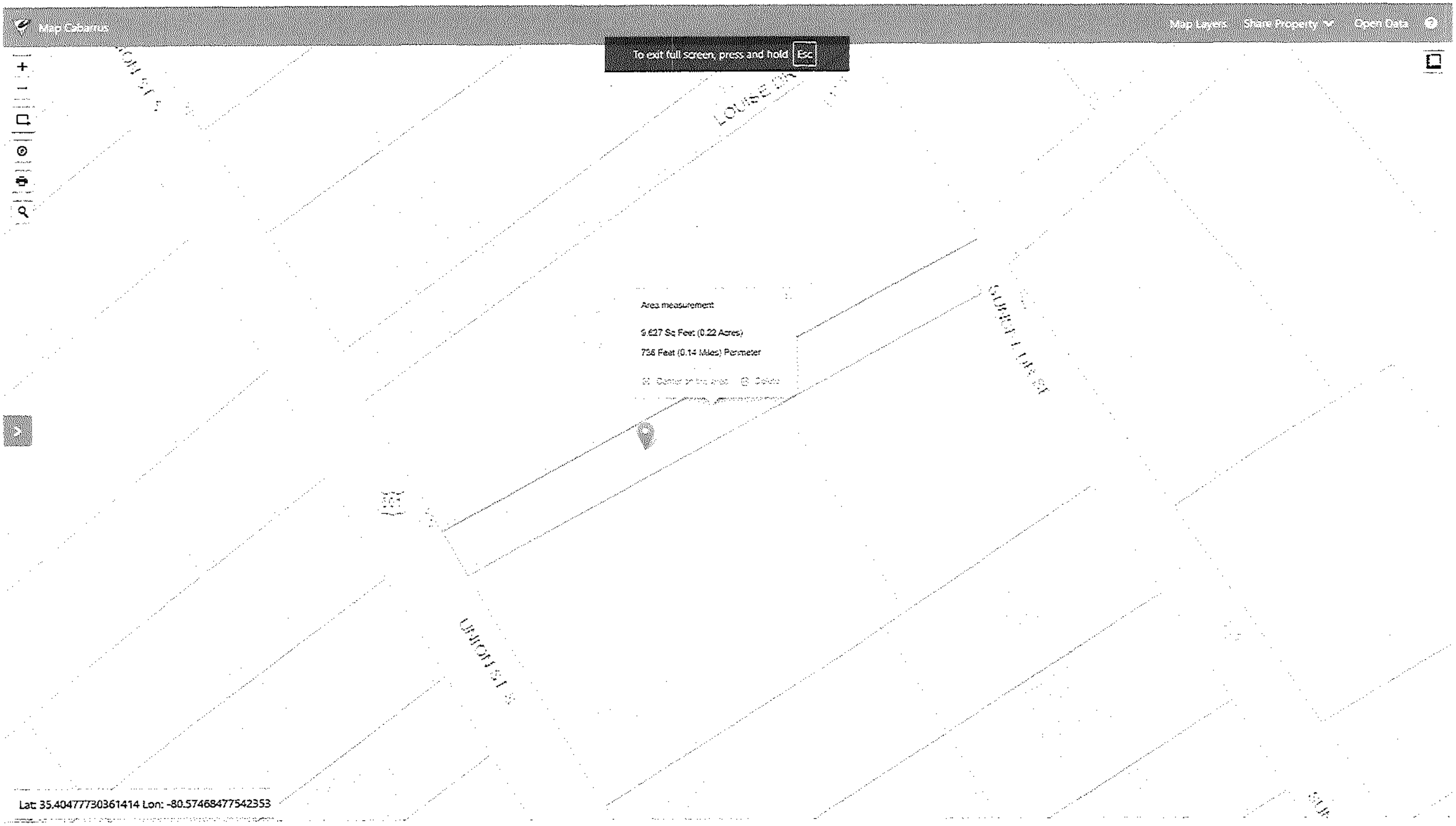
1. Legal petition (boundary description)
2. Tax map with subject right-of-way delineated
3. Filing fee (*check payable to City of Concord*) – see the Official Fee Schedule for the applicable fee.
4. Cabarrus County Land Records print-out of names and addresses of all immediately adjacent

Please submit this application to the Planning & Neighborhood Development Department

Staff Use Only:

Fee: _____ Received by: _____ Date: _____

Planning & Neighborhood Development
35 Cabarrus Avenue W • P. O. Box 308 • Concord, NC 28025
Phone (704) 920-5152 • Fax (704) 920-6962 • www.concordnc.gov



1
A-1

PROPOSED ALLY (CANAL ST) CLOSURE PETITION-GIS IMAGERY

Scale: NTS

KANNAPOLIS Construction

REVISIONS

Address: VARIES

Project: SOUTH UNION (CANAL ST)ALLY CLOSURE

FEB 11 2025

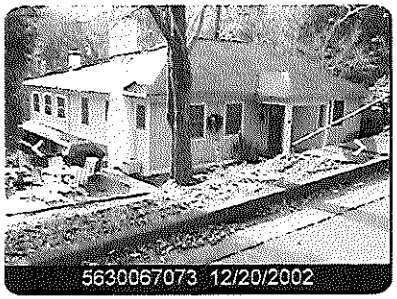
A-1

Property Details

To exit full screen, press and hold Esc

Quicklinks: Deed | Appraisal Card | Map Data error | Basic Search | Tax Bill Information

Property Photo (Click on image to enlarge)



Parcel Information

PIN: 56300670730000
Old PIN: N/A
Parent Real ID: N/A
Real ID: 123365 0131 100000
Fire District ID: City
City: Concord

Plat Book: 0000
Plat Page: 0000
Combined With? N/A
Retire Card? N/A
Lot Size/Acreage: 1.0000
Address: 4 LOUISE DR SE CONCORD NC 28025

Property Description: S/S LOUISE DRIVE S E
Tax Payer: BRADLEY STEPHEN L, BRADLEY KAREN R W/F
Comments: N/A

Annotation Information
No annotation information

Current Owners
BRADLEY STEPHEN L, BRADLEY KAREN R W/F

Site Addresses
4 LOUISE DR

Property History

View Plat	Plat Book	Plat Page	PIN	Old PIN	Parent Real ID	City	Fire District	Description	Size/Acreage	Date
N/A	00000	00000	56300670730000		N/A	Concord	City	S/S LOUISE DRIVE S E	1.0000 LT	07/08/2021
N/A			56300670730000		N/A	Concord	City	S/S LOUISE DRIVE S E	1.0000 LT	10/31/2007
N/A			56300670730000		N/A	Concord		S/S LOUISE DRIVE S E	1.0000 LT	

Historical Owners Card

View Deed	Type	Owner	%	Stamps	Date	Deed Book	Deed Page	Comments	Current Owner	Additional Deeds
147560197		BRADLEY KAREN R WF	0	252.00	08/24/1995	1476	0137		Yes	No
147560197		BRADLEY STEPHEN L	0	252.00	08/24/1995	1476	0137		Yes	No

1
A-1

BRADLEY STEPHEN L, BRADLEY KAREN R WF
4 LOUISE DR SE CONCORD NC 28025-56300670730000

Scale: NTS

REVISIONS

FEB 11 2025

KANNAPOLIS Construction

Address: VARIES

Project: SOUTH UNION (CANAL ST)ALLY CLOSURE

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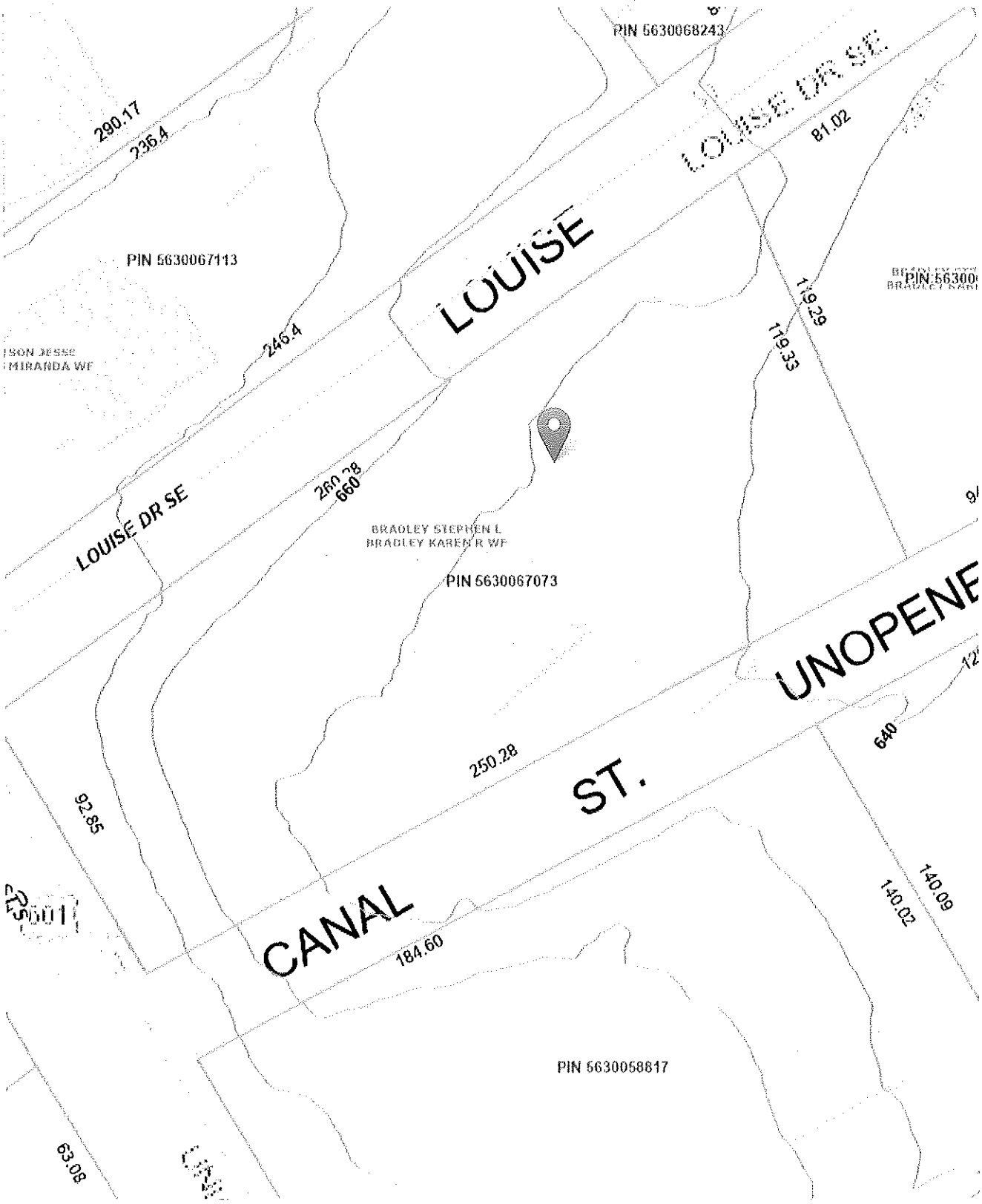
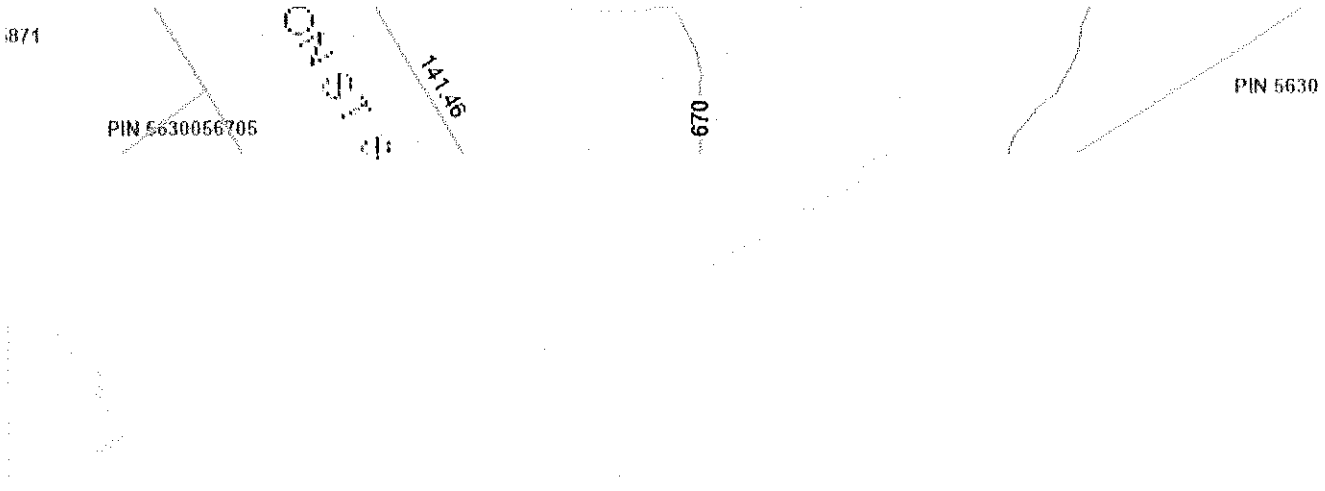

PIN 5630068243
LOUISE DR SE
81.02
290.17
236.4
PIN 5630067113
LOUISE
246.4
119.29
119.33
LOUISE DR SE
260.28
660
BRADLEY STEPHEN L
BRADLEY KAREN R WF
PIN 5630067073
UNOPENE
640
250.28
ST.
92.85
CANAL
184.60
140.09
140.02
PIN 5630068817
63.08



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Physical Address:	4 LOUISE DR SE CONCORD NC 28025	PIN14:	56300670730000
Account Name 1:	BRADLEY STEPHEN L	Account Name 2:	BRADLEY KAREN R WF
Mailing Address:	4 LOUISE DR SE	Mailing City:	CONCORD
Mailing State:	NC	Mailing Zip Code:	28025
Property Real ID:	12-035 -0161.10	Plat Book:	00000
Plat Page:	00000	Land Units:	1
Units Type:	LT	Land Value:	LT
Building Value:	296820	OBXF Value:	undefined
Assessed Value:	435920	Market Value:	435920
Sale Year:	1995	Sale Month:	8
Sale Price:	126000	Deed Book:	1476
Deed Page:	0137	Fire District:	
Zoning:	RV	Elementary School:	R. Brown McAllister ES
Middle School:	Concord MS	High School:	Concord HS
Precinct Name:	undefined	Legal Description:	undefined
Floodway:	No	100 Yr Flood:	No
500 Yr Flood:	No	Watershed	undefined
FIRM Panel Number	undefined		

Property Details

To exit full screen, press and hold Esc

QuickLinks: Deed | Appraisal Card | Map Oaberrus | Book Search | Tax Bill Information

Property Photo (Click on image to enlarge)

Parcel Information

Pin: 56300691100000
Old Pin: N/A
Parent Real ID: N/A
Real ID: 12085 0161 000000
Fire District ID: City
City: Concord

Plat Book: UNAVAILABLE
Plat Page: UNAVAILABLE
Combined With? N/A
Retire Card? N/A
Lot Size/Acreage: 0.2500
Address: LOUISE DR SE NC

Property Description: S/S LOUISE DRIVE S E
Tax Payer: BRADLEY STEPHEN L BRADLEY KAREN R WF
Comments: N/A

Annexation Information
No annexation information

Current Owners
BRADLEY STEPHEN L BRADLEY KAREN R WF

Site Addresses
LOUISE DR

Property History

View Plat	Plat Book	Plat Page	Pin	Old Pin	Parent Real ID	City	Fire Department	Description	Size/Acreage	Date
N/A			56300691100000		N/A	Concord	City	S/S LOUISE DRIVE S E	0.2500 AC	11/05/2007
N/A			56300691100000		N/A	Concord		S/S LOUISE DRIVE S E	0.2500 AC	02/16/2005

Historical Owners Card

View Deed	Type	Owner	%	Stamps	Date	Deed Book	Deed Page	Comments	Current Owner	Additional Deeds
56240349	Transfer	BRADLEY KAREN R WF	0	20.00	10/27/2004	5624	0349		Yes	No
56240349	Transfer	BRADLEY STEPHEN L	0	20.00	10/27/2004	5624	0349		Yes	No

1
A-1

BRADLEY STEPHEN L, BRADLEY KAREN R WF
LOUISE DR SE NC-56300691100000

Scale: NTS

REVISIONS

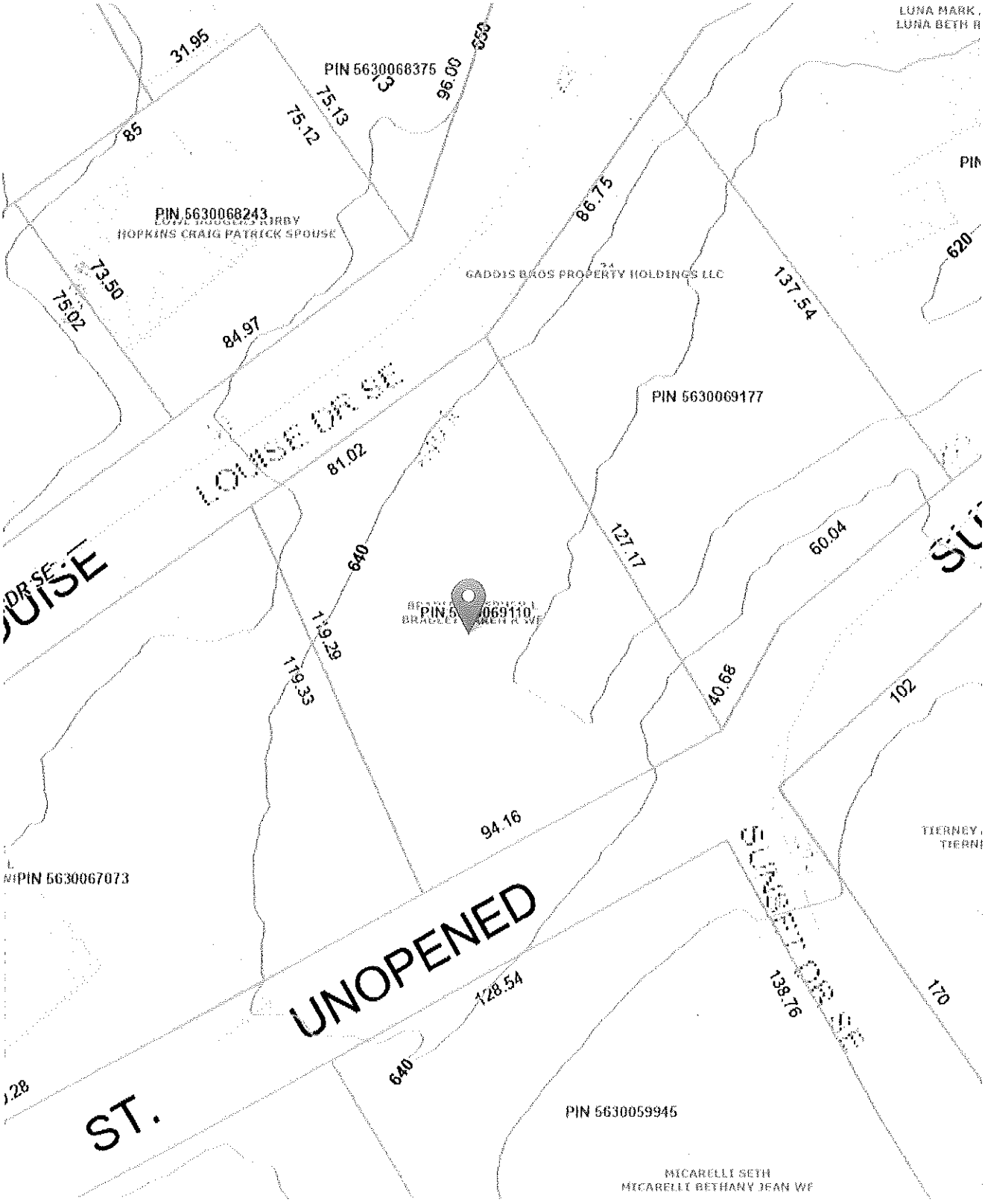
FEB 11 2025

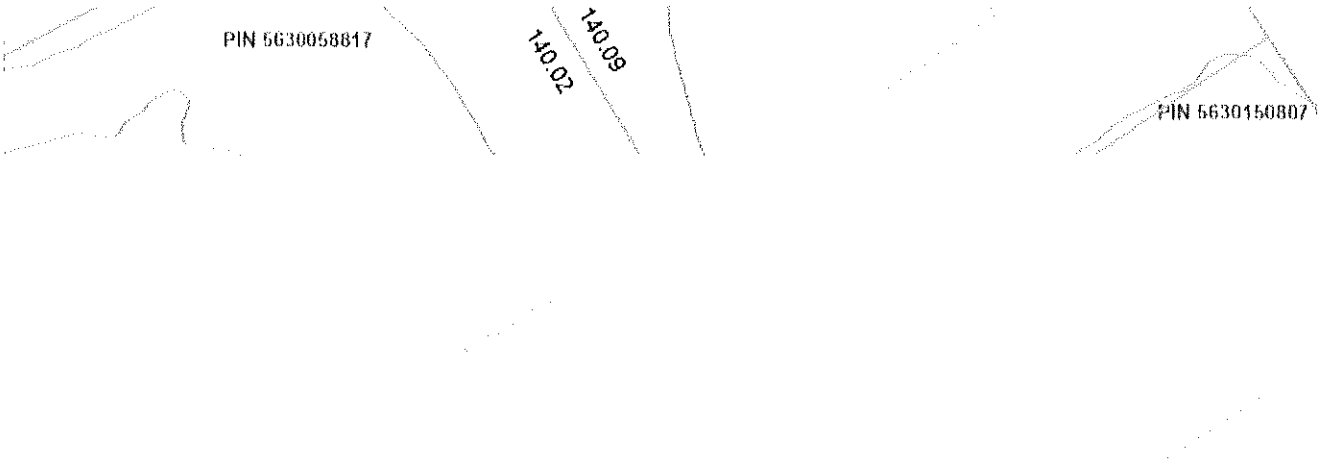
KANNAPOLIS
Construction

Address: VARIES

Project: SOUTH UNION (CANAL ST)ALLY CLOSURE

A-1


PIN 5630068375
PIN 5630068243
HOPKINS CRAIG PATRICK SPOUSE
GADDIS BROS PROPERTY HOLDINGS LLC
PIN 5630069177
PIN 5630069110
PIN 5630067073
PIN 5630059945
MICARELLI SETH
MICARELLI BETHANY JEAN WF
UNOPENED
ST.
31.95
75.13
75.12
96.00
86.75
73.50
75.02
84.97
81.02
137.54
127.17
60.04
119.29
119.33
40.68
102
94.16
128.54
138.76
170
640
620



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Physical Address:		PIN14:	56300691100000
Account Name 1:	BRADLEY STEPHEN L	Account Name 2:	BRADLEY KAREN R WF
Mailing Address:	4 LOUISE DR SE	Mailing City:	CONCORD
Mailing State:	NC	Mailing Zip Code:	28025
Property Real ID:	12-035 -0161.00	Plat Book:	
Plat Page:		Land Units:	0.25
Units Type:	AC	Land Value:	AC
Building Value:	0	OBXF Value:	undefined
Assessed Value:	24900	Market Value:	24900
Sale Year:	2004	Sale Month:	10
Sale Price:	10000	Deed Book:	5624
Deed Page:	0349	Fire District:	
Zoning:	RM-2	Elementary School:	R. Brown McAllister ES
Middle School:	Concord MS	High School:	Concord HS
Precinct Name:	undefined	Legal Description:	undefined
Floodway:	No	100 Yr Flood:	No
500 Yr Flood:	No	Watershed	undefined
FIRM Panel Number	undefined		

Property Details

Quicklinks: Deed | Appraisal Card | Map Cabarrus | Beds Search | Tax Bill Information

Property Photo (Click on image to enlarge)

Parcel Information

Pin: 5630058817000000
Old Pin: N/A
Parent Real ID: N/A
Real ID: 12035 01 69.000000
Fire District ID: City
City: Concord

Plat Book: 0000
Plat Page: 0000
Combined With: N/A
Returned? N/A
Lot Size/Acreage: 1.0000
Address: 239 UNION ST S CONCORD NC 28025

Property Description: E/S UNION ST S
Tax Payers: POWELL RENDA B &, POWELL ALBERT W /HUSB
Comments: N/A

Annexation Information
No annexation information

Current Owners
POWELL RENDA B &, POWELL ALBERT W /HUSB

Site Addresses
239 UNION ST

Property History

View Plat	Plat Book	Plat Page	Pin	Old Pin	Parent Real ID	City	Fire Department	Description	Size/Acreage	Date
N/A	00000	00000	56300588170000		N/A	Concord	City	E/S UNION ST S	1.0000 LT	03/03/2021
N/A			56300588170000		N/A	Concord	City	E/S UNION ST S	1.0000 LT	10/31/2007
N/A			56300588170000		N/A	Concord		E/S UNION ST S	1.0000 LT	10/06/2000

Historical Owners Card

View Deed	Type	Owner	%	Stamps	Date	Deed Book	Deed Page	Comments	Current Owner	Additional Deeds
4771 0239	Transfer	POWELL ALBERT W /HUSB	0.000	0.00	08/15/2003	4771	0239		Yes	No
4771 0239	Transfer	POWELL RENDA B &	0.000	0.00	08/15/2003	4771	0239		Yes	No

1
A-1

POWELL RENDA B &, POWELL ALBERT W /HUSB
239 UNION ST S, CONCORD, NC 28025

Scale: NTS

KANNAPOLIS Construction

REVISIONS

Address: VARIES

Project: SOUTH UNION (CANAL ST)ALLY CLOSURE

FEB 11 2025

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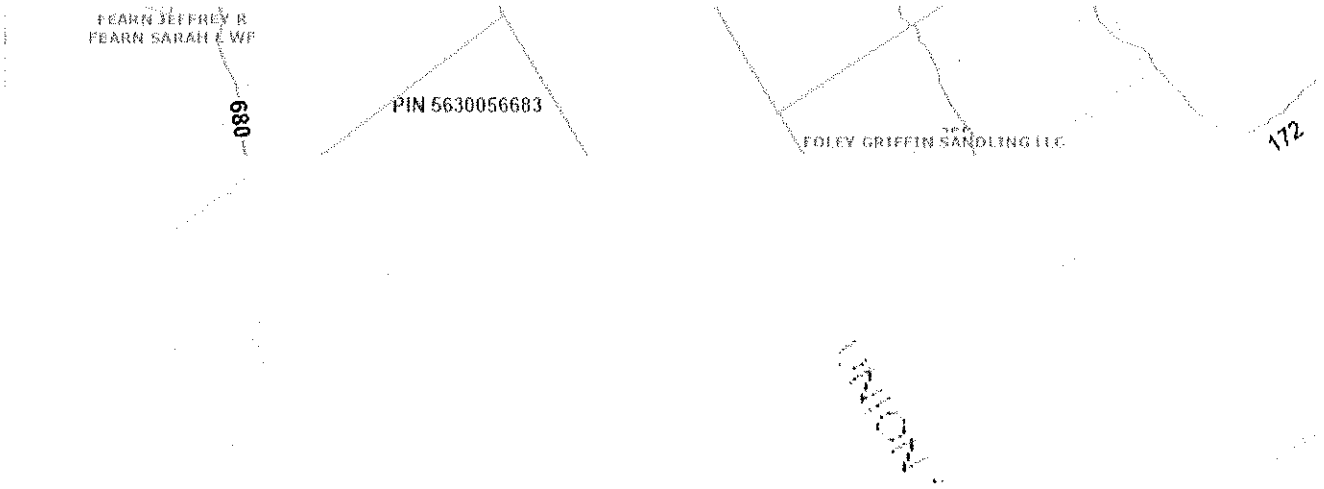
BRADLEY STEPHEN L
BRADLEY KAREN R WF
PIN 5630067073
PIN 5630069
UISE DR SE
260.28
660
UNOPENE
128.
640
250.28
ST.
CANAL
184.60
92.85
140.09
140.02
PIN 5630058817
UNION ST S
63.08
141.46
670
52
POWELL RENDA B &
POWELL ALBERT W HUSB
186.69
183.27
PIN 5630058779
ECK JASON
K JAMIE WF
80.54
186.39
CROSSLIN BUILDERS LLC
70.26
PIN 563
PIN 563005
680



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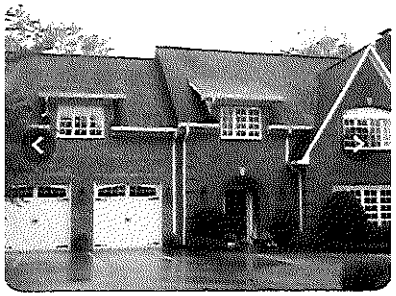
Physical Address:	239 UNION ST S CONCORD NC 28025	PIN14:	56300588170000
Account Name 1:	POWELL RENDA B &	Account Name 2:	POWELL ALBERT W /HUSB
Mailing Address:	239 UNION STREET S	Mailing City:	CONCORD
Mailing State:	NC	Mailing Zip Code:	28025
Property Real ID:	12-035 -0159.00	Plat Book:	00000
Plat Page:	00000	Land Units:	1
Units Type:	LT	Land Value:	LT
Building Value:	322100	OBXF Value:	undefined
Assessed Value:	478630	Market Value:	478630
Sale Year:	2003	Sale Month:	8
Sale Price:	0	Deed Book:	4771
Deed Page:	0239	Fire District:	
Zoning:	RV	Elementary School:	R. Brown McAllister ES
Middle School:	Concord MS	High School:	Concord HS
Precinct Name:	undefined	Legal Description:	undefined
Floodway:	No	100 Yr Flood:	No
500 Yr Flood:	No	Watershed	undefined
FIRM Panel Number	undefined		

Property Details

Quicklinks: Deed | Appraisal Card | Map Cabarrus | Basic Search | Tax Bill Information

Property Photo (Click on image to enlarge)



Parcel Information

Pin: 56300599450000
Old Pin: N/A
Parent Real ID: N/A
Real ID: 12065 0145.000000
Fire District ID: City
City: Concord

Plat Book: 0000
Plat Page: 0000
Combined With? N/A
Retire Card? N/A
Lot Size/Acreage: 0.4200
Address: 270 SUNSET DR SE CONCORD NC 28025

Property Description: WEST SIDE SUNSET DR
Tax Payers: MICARELLI SETH, MICARELLI BETHANY JEAN WF
Comments: N/A

Annexation Information
No annexation information

Current Owners
MICARELLI SETH, MICARELLI BETHANY JEAN WF

Site Addresses
270 SUNSET DR

Property History

View Plat	Plat Book	Plat Page	Pin	Old Pin	Parent Real ID	City	Fire Department	Description	Size/Acreage	Date
N/A	00000	00000	56300599450000		N/A	Concord	City	WEST SIDE SUNSET DR	0.4200 AC	06/04/2021
N/A			56300599450000		N/A	Concord	City	WEST SIDE SUNSET DR	0.4200 AC	11/06/2017
N/A			56300599450000		N/A	Concord	City	W/S SUNSET DRIVE S E	0.4200 AC	01/14/2009
N/A			56300599450000		N/A	Concord		W/S SUNSET DRIVE S E	0.4200 AC	02/25/2003
N/A			56300599450000		N/A	Concord		W/S SUNSET DRIVE S E	0.4100 AC	

Historical Owners Data

View Deed	Type	Owner	%	Changes	Date	Deed Book	Deed Page	Comments	Current Owner	Additional Pins

1
A-1

MICARELLI SETH, MICARELLI BETHANY JEAN WF
270 SUNSET DR SE CONCORD NC 28025

Scale: NTS

KANNAPOLIS Construction

REVISIONS

Address: VARIES

Project: SOUTH UNION (CANAL STALLY CLOSURE

FEB 11 2025

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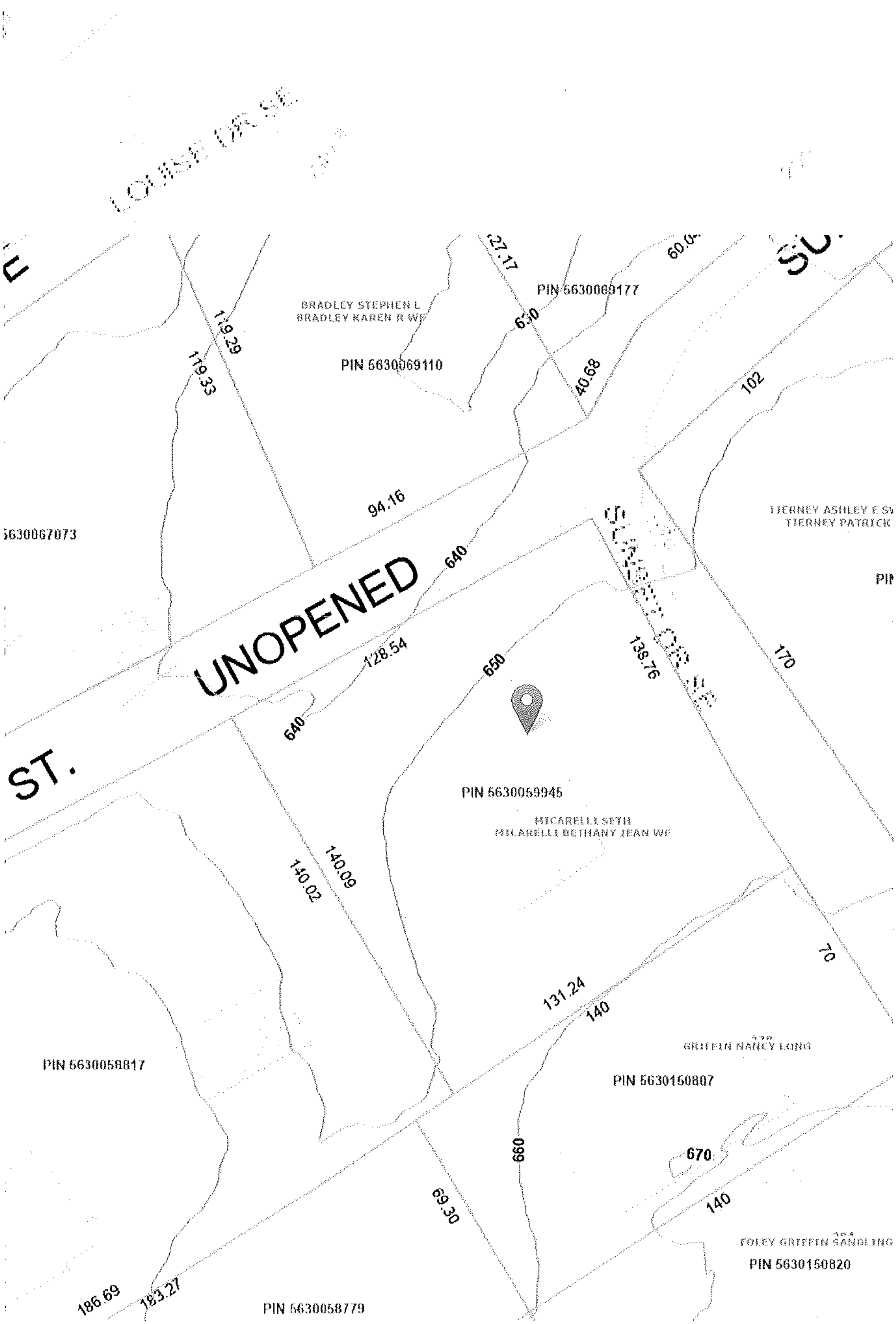
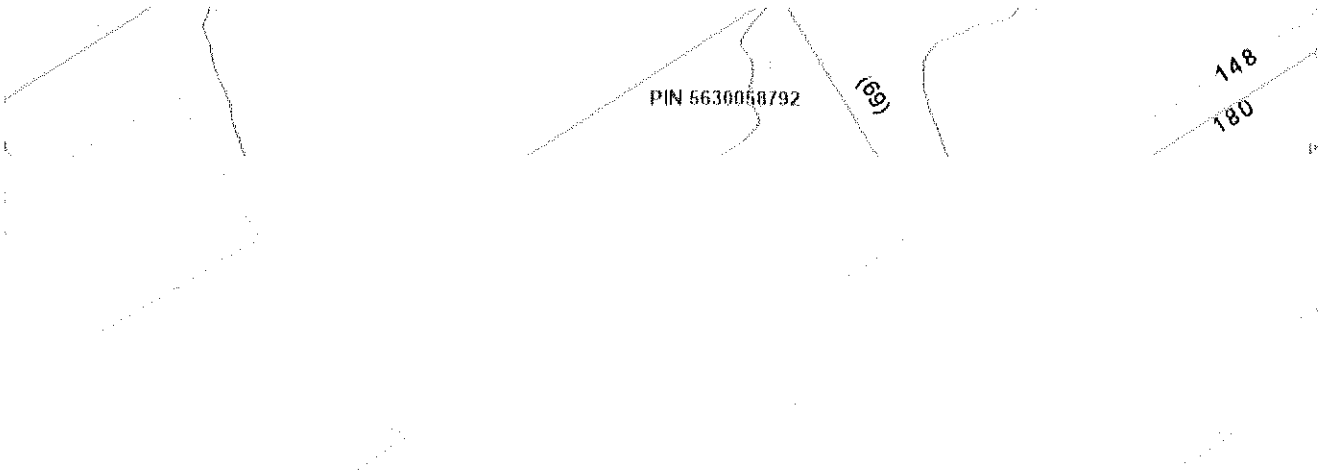

LOUISE DR SE
BRADLEY STEPHEN L
BRADLEY KAREN R WF
PIN 5630069110
PIN 5630069177
119.29
119.33
630
40.68
102
94.16
640
UNOPENED
ST.
128.54
650
640
138.76
170
TIERNEY PATRICK
PIN 5630059945
MICARELLI SETH
MICARELLI BETHANY JEAN WF
140.09
140.02
70
131.24
140
GRIFFIN NANCY LONG
PIN 5630150807
PIN 5630058817
660
670
140
69.30
PIN 5630150820
186.69
183.27
PIN 5630058779



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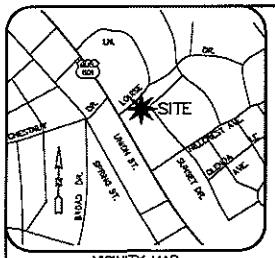
Physical Address:	270 SUNSET DR SE CONCORD NC 28025	PIN14:	56300599450000
Account Name 1:	MICARELLI SETH	Account Name 2:	MICARELLI BETHANY JEAN WF
Mailing Address:	270 SUNSET DR SE	Mailing City:	CONCORD
Mailing State:	NC	Mailing Zip Code:	28025
Property Real ID:	12-035 -0145.00	Plat Book:	00000
Plat Page:	00000	Land Units:	0.42
Units Type:	AC	Land Value:	AC
Building Value:	458220	OBXF Value:	undefined
Assessed Value:	557580	Market Value:	557580
Sale Year:	2022	Sale Month:	1
Sale Price:	530000	Deed Book:	15811
Deed Page:	0084	Fire District:	
Zoning:	RM-2	Elementary School:	R. Brown McAllister ES
Middle School:	Concord MS	High School:	Concord HS
Precinct Name:	undefined	Legal Description:	undefined
Floodway:	No	100 Yr Flood:	No
500 Yr Flood:	No	Watershed	undefined
FIRM Panel Number	undefined		



VICINITY MAP
NOT TO SCALE

CERTIFICATE OF OWNERSHIP AND OFFER OF DEDICATION. I HEREBY CERTIFY THAT I AM OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF THE CITY OF CONCORD, AND THAT I HEREBY SUBMIT THIS PLAN OF SUBDIVISION WITH MY FREE CONSENT, ESTABLISH MINIMUM BUILDING SETBACK LINES, AND DEDICATE TO PUBLIC USE ALL AREAS SHOWN ON THIS PLAT AS STREETS, SIDEWALKS, GREENWAYS, RIGHTS OF WAY, EASEMENTS, AND/OR OPEN SPACE AND/OR PARKS, EXCEPT ANY OF THOSE USES SPECIFICALLY INDICATED AS PRIVATE, AND I FURTHER DEDICATE ALL SANITARY SEWER, STORMWATER DRAINAGE, AND WATER LINES THAT ARE LOCATED IN ANY PUBLIC UTILITY EASEMENT OR RIGHT OF WAY AND CERTIFY THAT I WILL MAINTAIN ALL SUCH AREAS UNTIL ACCEPTED BY THE CITY OF CONCORD, AND FURTHER THAT I HEREBY GUARANTEE THAT I WILL CORRECT DEFECTS OR FAILURE OF IMPROVEMENTS IN SUCH AREAS FOR A PERIOD OF ONE YEAR COMMENCING AFTER FINAL ACCEPTANCE OF REQUIRED IMPROVEMENTS. ANY STREETS INDICATED AS PRIVATE SHALL BE OPEN TO PUBLIC USE, BUT SHALL BE PRIVATELY MAINTAINED. SAID DEDICATION SHALL BE IRREVOCABLE. PROVIDED DEDICATIONS OF EASEMENTS FOR STORM DRAINAGE, WHETHER INDICATED AS PRIVATE OR PUBLIC, ARE NOT MADE TO THE CITY OF CONCORD BUT ARE IRREVOCABLY MADE TO THE SUBSEQUENT OWNERS OF ANY AND ALL PROPERTIES SHOWN HEREON FOR THEIR USE AND BENEFIT UNLESS SPECIFICALLY DESIGNATED A DRAINAGE EASEMENT TO THE CITY OF CONCORD.

BY: _____ OWNER _____ DATE

BY: _____ OWNER _____ DATE

BY: _____ OWNER _____ DATE

BY: _____ OWNER _____ DATE

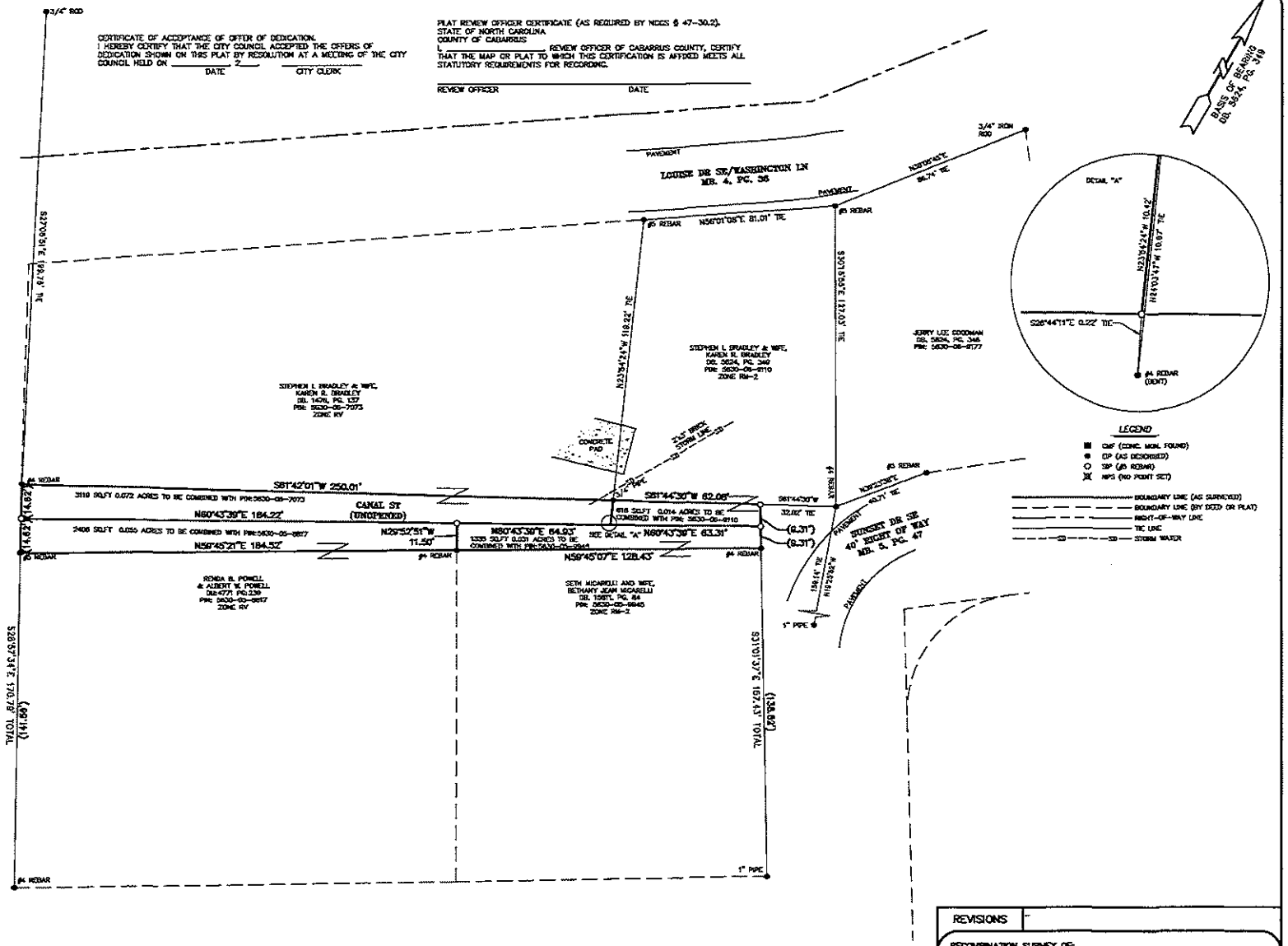
BY: _____ OWNER _____ DATE

BY: _____ OWNER _____ DATE

CERTIFICATE OF ACCEPTANCE OF OFFER OF DEDICATION.
I HEREBY CERTIFY THAT THE CITY COUNCIL ACCEPTED THE OFFERS OF DEDICATION SHOWN ON THIS PLAT BY RESOLUTION AT A MEETING OF THE CITY COUNCIL HELD ON _____ DATE _____ CITY CLERK

PLAT REVIEW OFFICER CERTIFICATE (AS REQUIRED BY NCGS § 47-30.2).
STATE OF NORTH CAROLINA
COUNTY OF CABARRUS
I, _____, REVIEW OFFICER OF CABARRUS COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

REVIEW OFFICER _____ DATE



I, DAVID L. HAYWOOD JR., CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED RECORDED IN DEEDS AS SHOWN HEREON); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN DEEDS AS SHOWN; THAT THE RATIO OF PRECISION AS CALCULATED IS 1:40,727; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED; AND THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION.

WITNESS MY ORIGINAL SIGNATURE AND SEAL THIS THE 3RD DAY OF MARCH, 2025

PRELIMINARY PLAT
NOT FOR RECORDATION,
CONVEYANCES OR SALES.

DAVID L. HAYWOOD, JR. PLS L-4622

NOTES:
1. TRAVERSE ADJUSTED BY THE LEAST SQUARES ADJUSTMENT METHOD. RAW CLOSURE IS 1:40,727.
2. AREAS DETERMINED BY COORDINATE COMPUTATIONS.
3. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES UNLESS OTHERWISE NOTED.
4. NO UNDERGROUND UTILITIES WERE LOCATED WITH THIS SURVEY. BEFORE DOING ANY DIGGING, CALL NC 811-CALL (1-800-632-4949).
5. SURVEYED AREA IS LOCATED IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS SCALED FROM F.I.R.M. MAP NUMBER 3710563000K; EFFECTIVE DATE NOVEMBER 16, 2018.
6. THIS SURVEY WAS DONE WITHOUT THE BENEFIT OF A TITLE REPORT; ADDITIONAL EASEMENTS AND RIGHT OF WAYS OF RECORD NOT SHOWN HEREON MAY EXIST.
7. THIS MAP MEETS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (21 NCAC 56.1600).

REFERENCES:
1. ALL DEEDS AND MAPS ARE SHOWN HEREON.
2. CABARRUS COUNTY GIS TAX MAP AND REGISTER OF DEEDS.
3. HTTPS://PRS.NC.GOV/
4. RECORDED MAP TITLED "SUBDIVISION PLAN OF HILLCREST"; DATED SEPTEMBER 1932; SURVEYED BY REECE IRA LONG; MB:4 PG:36.
5. RECORDED MAP TITLED "SUBDIVISION PLAN OF HILLCREST"; DATED DECEMBER 31, 1937; SURVEYED BY REECE IRA LONG; MB:5 PG:47

REVISIONS

RECOMBINATION SURVEY OF:

CANAL ST.

NO. 12 TOWNSHIP, CITY OF CONCORD, CABARRUS CO., NORTH CAROLINA

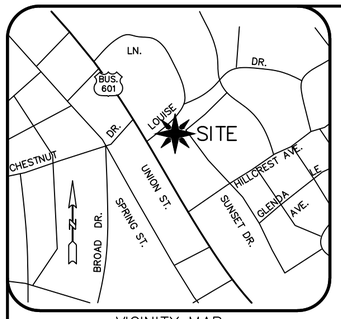
FOR CLIENT:
STEPHEN L. BRADLEY
4 LOUISE DR SE
CONCORD, NC 28025

DATE: 03/03/2025
REVISED:
SCALE: 1" = 30'
JOB NO.: 240613.000

COMPUTED BY: MTM
DRAWN BY: MTM
CHECKED BY: DLH

SCALE IN FEET
0 30 60 90

CESI
CIVIL - GEOTECHNICAL - SURVEYING
N.C. FIRM LICENSE NO. C-0263
45 SPRING STREET SW
CONCORD, NC 28025
CONCORD (704) 786-5464
FAX (704) 786-7454
ACAD FILE: ...DWG



VICINITY MAP
NOT TO SCALE

CERTIFICATE OF OWNERSHIP AND OFFER OF DEDICATION. I HEREBY CERTIFY THAT I AM OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON, WHICH IS LOCATED IN THE SUBDIVISION JURISDICTION OF THE CITY OF CONCORD, AND THAT I HEREBY SUBMIT THIS PLAN OF SUBDIVISION WITH MY FREE CONSENT, ESTABLISH MINIMUM BUILDING SETBACK LINES, AND DEDICATE TO PUBLIC USE ALL AREAS SHOWN ON THIS PLAT AS STREETS, SIDEWALKS, GREENWAYS, RIGHTS OF WAY, EASEMENTS, AND/OR OPEN SPACE AND/OR PARKS, EXCEPT ANY OF THOSE USES SPECIFICALLY INDICATED AS PRIVATE, AND I FURTHER DEDICATE ALL SANITARY SEWER, STORMWATER DRAINAGE AND WATER LINES THAT ARE LOCATED IN ANY PUBLIC UTILITY EASEMENT OR RIGHT OF WAY AND CERTIFY THAT I WILL MAINTAIN ALL SUCH AREAS UNTIL ACCEPTED BY THE CITY OF CONCORD, AND FURTHER THAT I HEREBY GUARANTEE THAT I WILL CORRECT DEFECTS OR FAILURE OF IMPROVEMENTS IN SUCH AREAS FOR A PERIOD OF ONE YEAR COMMENCING AFTER FINAL ACCEPTANCE OF REQUIRED IMPROVEMENTS. ANY STREETS INDICATED AS PRIVATE SHALL BE OPEN TO PUBLIC USE, BUT SHALL BE PRIVATELY MAINTAINED. SAID DEDICATION SHALL BE IRREVOCABLE PROVIDED DEDICATIONS OF EASEMENTS FOR STORM DRAINAGE, WHETHER INDICATED AS PRIVATE OR PUBLIC, ARE NOT MADE TO THE CITY OF CONCORD BUT ARE IRREVOCABLY MADE TO THE SUBSEQUENT OWNERS OF ANY AND ALL PROPERTIES SHOWN HEREON FOR THEIR USE AND BENEFIT UNLESS SPECIFICALLY DESIGNATED A DRAINAGE EASEMENT TO THE CITY OF CONCORD.

BY: _____
OWNER DATE

BY: _____
OWNER DATE

BY: _____
OWNER DATE

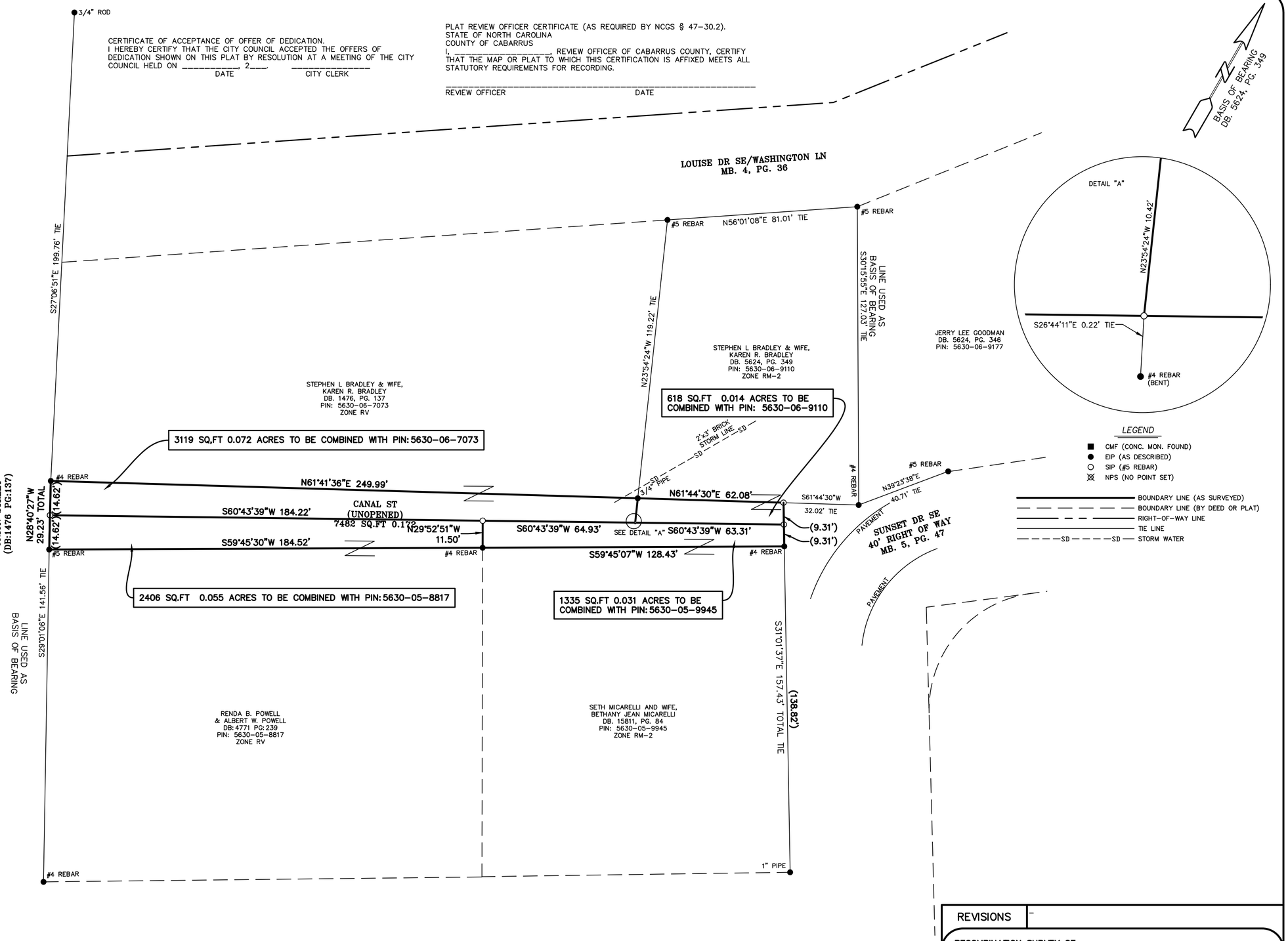
BY: _____
OWNER DATE

BY: _____
OWNER DATE

CERTIFICATE OF ACCEPTANCE OF OFFER OF DEDICATION.
I HEREBY CERTIFY THAT THE CITY COUNCIL ACCEPTED THE OFFERS OF DEDICATION SHOWN ON THIS PLAT BY RESOLUTION AT A MEETING OF THE CITY COUNCIL HELD ON _____, 2___.
DATE CITY CLERK

PLAT REVIEW OFFICER CERTIFICATE (AS REQUIRED BY NCGS § 47-30.2).
STATE OF NORTH CAROLINA
COUNTY OF CABARRUS
I, _____, REVIEW OFFICER OF CABARRUS COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING.

_____
REVIEW OFFICER DATE



LEGEND
- ■ CMF (CONC. MON. FOUND)
- ● EIP (AS DESCRIBED)
- ○ SIP (#5 REBAR)
- ⊗ NPS (NO POINT SET)
- BOUNDARY LINE (AS SURVEYED)
- BOUNDARY LINE (BY DEED OR PLAT)
- RIGHT-OF-WAY LINE
- TIE LINE
- SD SD STORM WATER

I, DAVID L. HAYWOOD JR., CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED RECORDED IN DEEDS AS SHOWN HEREON); THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS DRAWN FROM INFORMATION FOUND IN DEEDS AS SHOWN; THAT THE RATIO OF PRECISION AS CALCULATED IS 1:49,727; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED; AND THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION.

WITNESS MY ORIGINAL SIGNATURE AND SEAL THIS THE 11TH DAY OF MARCH, 2025

PRELIMINARY PLAT
NOT FOR RECORDATION,
CONVEYANCES OR SALES.

DAVID L. HAYWOOD, JR. PLS L-4822

NOTES:
1. TRAVERSE ADJUSTED BY THE LEAST SQUARES ADJUSTMENT METHOD. RAW CLOSURE IS 1:49,727.
2. AREAS DETERMINED BY COORDINATE COMPUTATIONS.
3. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES UNLESS OTHERWISE NOTED.
4. NO UNDERGROUND UTILITIES WERE LOCATED WITH THIS SURVEY. BEFORE DOING ANY DIGGING, CALL NC NE-CALL (1-800-632-4949).
5. SURVEYED AREA IS LOCATED IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS SCALED FROM F.I.R.M. MAP NUMBER 3710563000K; EFFECTIVE DATE NOVEMBER 16. 2018.
6. THIS SURVEY WAS DONE WITHOUT THE BENEFIT OF A TITLE REPORT; ADDITIONAL EASEMENTS AND RIGHT OF WAYS OF RECORD NOT SHOWN HEREON MAY EXIST.
7. THIS MAP MEETS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE FOR LAND SURVEYING IN NORTH CAROLINA (21 NCAC 56.1600).

REFERENCES:
1. ALL DEEDS AND MAPS ARE SHOWN HEREON.
2. CABARRUS COUNTY GIS TAX MAP AND REGISTER OF DEEDS.
3. HTTPS://FRIS.NC.GOV/
4. RECORDED MAP TITLED "SUBDIVISION PLAN OF HILLCREST"; DATED SEPTEMBER 1932; SURVEYED BY REECE IRA LONG; MB: 4 PG: 36.
5. RECORDED MAP TITLED "SUBDIVISION PLAN OF HILLCREST"; DATED DECEMBER 31, 1937; SURVEYED BY REECE IRA LONG; MB: 5 PG: 47

REVISIONS -

RECOMBINATION SURVEY OF:

CANAL ST.

NO. 12 TOWNSHIP, CITY OF CONCORD, CABARRUS CO., NORTH CAROLINA

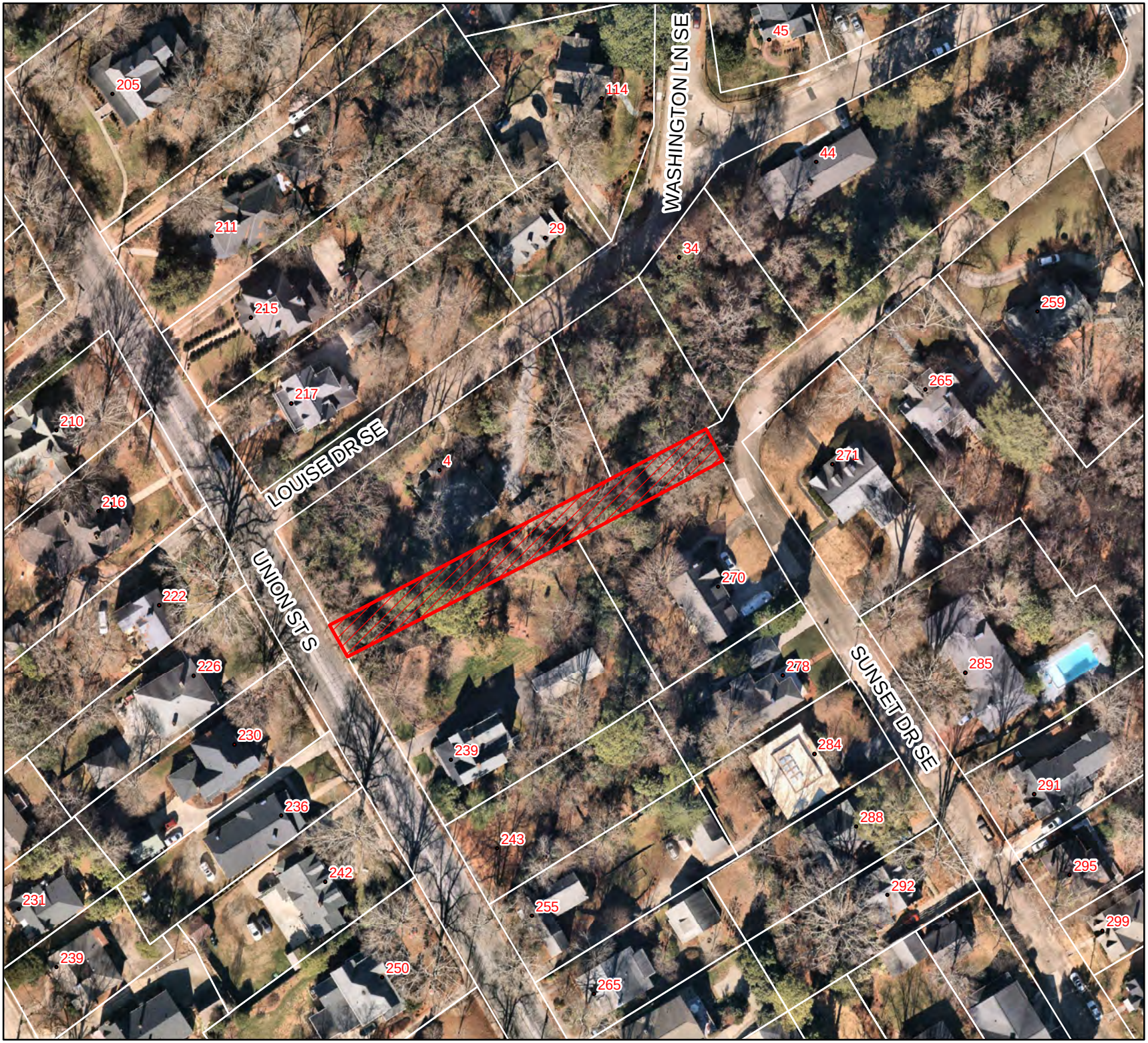
FOR CLIENT:
STEPHEN L. BRADLEY
4 LOUISE DR SE
CONCORD, NC 28025

DATE: 03/11/2025
REVISED:
SCALE: 1" = 30'
JOB NO.: 240613.000

COMPUTED BY: MTM
DRAWN BY: MTM
CHECKED BY: DLH

SCALE IN FEET
0 30 60 90

CESI
CIVIL - GEOTECHNICAL - SURVEYING
N.C. FIRM LICENSE NO. C-0263
45 SPRING STREET SW CONCORD (704) 786-5404
CONCORD, NC 28025 FAX (704) 786-7454
ACAD FILE: _.DWG



Concord
NORTH CAROLINA

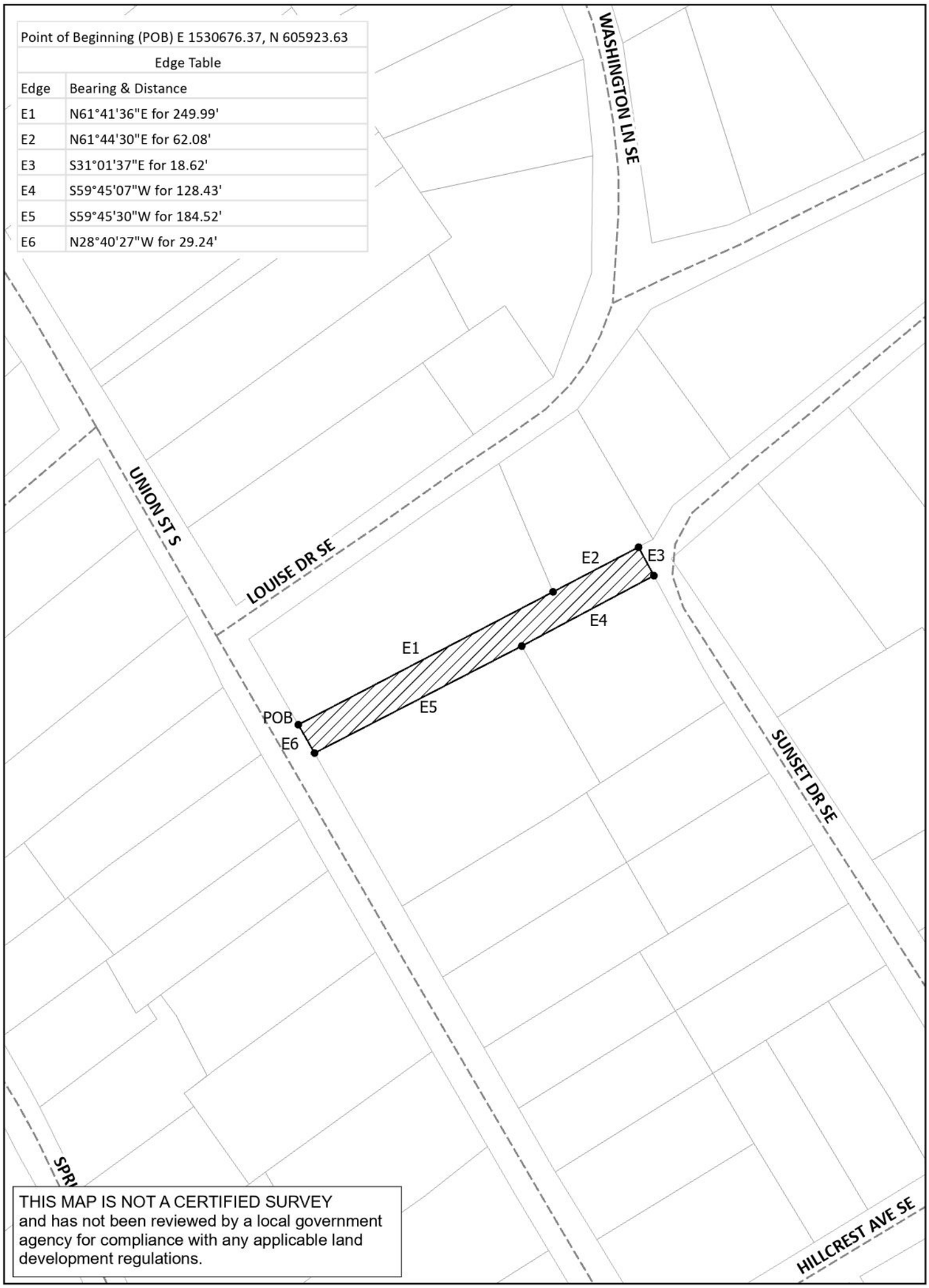
Right-of-Way
Proposed Closure

Closure Area
Addresses
Parcels

N
W E
S

0 50 100
Feet

Point of Beginning (POB) E 1530676.37, N 605923.63	
Edge Table	
Edge	Bearing & Distance
E1	N61°41'36"E for 249.99'
E2	N61°44'30"E for 62.08'
E3	S31°01'37"E for 18.62'
E4	S59°45'07"W for 128.43'
E5	S59°45'30"W for 184.52'
E6	N28°40'27"W for 29.24'



THIS MAP IS NOT A CERTIFIED SURVEY
and has not been reviewed by a local government agency for compliance with any applicable land development regulations.

Concord
NORTH CAROLINA

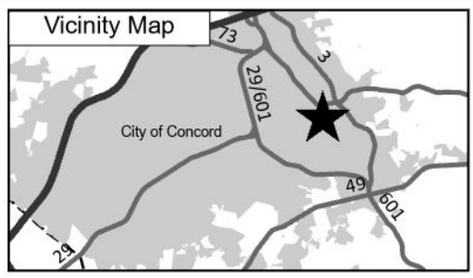
Right-of-Way Closure Map

Canal St (Alley) Concord, NC

Legend

- Closure Area
- Street Centerline
- Parcel Boundaries

Petitioned by:
Location: Union St S and Sunset Dr SE
Area: 0.172 acres



0 100 200 Feet

1 inch equals 102 feet

N W E S

Coordinate System: NAD 1983 State Plane NC FIPS 3200
Map prepared by City of Concord
Planning & Neighborhood Development Department

RESOLUTION OF INTENT

WHEREAS, G.S. 160A-299 authorizes the City Council to close public streets and alleys; and

WHEREAS, the City Council considers it advisable to conduct a public hearing for the purpose of giving consideration to the closure of an unopened portion of an alley parallel to Corban Avenue, SE as more specifically set forth below:

NOW, THEREFORE, BE IT RESOLVED by the City Council that:

(1) A meeting will be held at 6:00 p.m. on the 8th day of May, 2025 at the City Hall Council Chambers, 35 Cabarrus Ave. W, Concord, NC to consider a resolution on the closure of the area described as follows:

LYING AND BEING IN THE #12 TOWNSHIP, CABARRUS COUNTY, NORTH CAROLINA, LOCATED TO THE WEST OF SUNSET DR SE AND EAST OF UNION ST. S (HWY 601); AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A #4 REBAR ON THE EAST SIDE OF UNION ST S, BEING THE SOUTHWEST CORNER OF STEPHEN AND KAREN BRADLEY (DB. 1476, PG. 137), SAID POINT BEING S27°06'15"E, 199.76' FROM A 3/4" ROD;

THENCE FROM THE POINT AND PLACE OF BEGINNING WITH SAID BRADLEY'S SOUTHERN LINE N61°41'36"E, 249.99' TO A 3/4" PIPE, ALSO BEING THE SOUTHWEST CORNER OF STEPHEN & KAREN BRADLEY (DB. 5624, PG. 349);

THENCE WITH SAID BRADLEY (DB. 5624, PG. 349) N61°44'30"E 62.08' TO SET #5 REBAR;

THENCE A NEW LINE S31°01'37"E (PASSING A SET #5 REBAR AT A DISTANCE OF 9.31') FOR A TOTAL DISTANCE OF 18.62' TO A #4 REBAR, BEING THE NORTHEAST CORNER OF SETH MICARELLI AND WIFE, BETHANY JEAN MICARELLI (DB:15811, PG:84);

THENCE WITH SAID MICARELLI'S NORTHERN LINE S59°45'07"W, 128.43' TO A #4 REBAR, ALSO BEING THE NORTHEAST CORNER OF RENDA B. POWELL & ALBERT W. POWELL (4771, PG:239);

THENCE WITH SAID POWELL'S NORTHERN LINE S59°45'30"W, 184.52' TO A #5 REBAR ON THE EAST SIDE OF SAID UNION ST S;

THENCE N28°40'27"W (PASSING A SET #5 REBAR AT A DISTANCE OF 14.62') FOR A TOTAL DISTANCE OF 29.24' TO THE POINT AND PLACE OF BEGINNING, CONTAINING 0.172 ACRES.

(2) The City Clerk is hereby directed to publish this Resolution of Intent once a week for four successive weeks in The Independent Tribune or other newspaper of general circulation in the area.

(3) The City Clerk is further directed to transmit by registered or certified mail to each owner of property abutting upon that portion of said street a copy of this Resolution of Intent.

(4) The City Clerk is further directed to cause adequate notices of this Resolution of Intent and the scheduled public hearing to be posted as required by G.S. 160A-299.

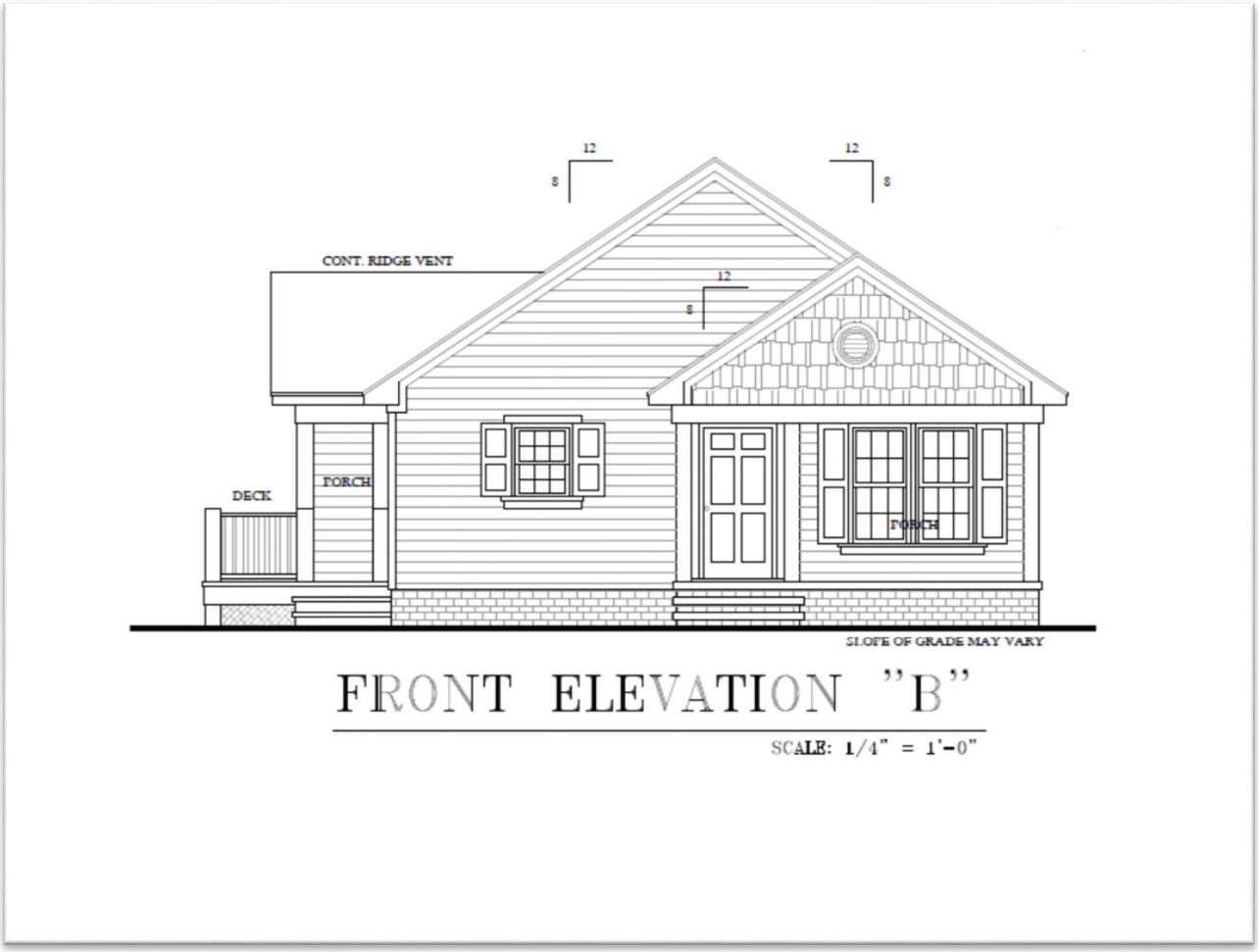
Adopted this 10th day of April 2025.

CITY COUNCIL
CITY OF CONCORD
NORTH CAROLINA

_____
William C. Dusch Mayor

ATTEST:

_____
Kim Deason, Clerk



Elevation for 133 Cypress Street – Henderson & Redfern

RESOLUTION GIVING PRELIMINARY APPROVAL TO ISSUANCE OF MULTIFAMILY HOUSING REVENUE BONDS FOR NORCUTT MILL

WHEREAS, the City Council (the "City Council") of the City of Concord, North Carolina (the "City") met in Concord, North Carolina at 6:00pm on the 10th day of April, 2025; and

WHEREAS, pursuant to Section 160D-1311(b) of the General Statutes of North Carolina, the City is granted the power to exercise directly the powers of a housing authority organized pursuant to the North Carolina Housing Authorities Law, Article 1 of Chapter 157 of the General Statutes of North Carolina, as amended (the "Act"); and

WHEREAS, the Act in N.C.G.S. § 157-9 gives the City, exercising the powers of a housing authority, the power "to provide for the construction, reconstruction, improvement, alteration or repair of any housing project" and "to borrow money upon its bonds, notes, debentures or other evidences of indebtedness and to secure the same by pledges of its revenues"; and

WHEREAS, Norcutt Mill 2025, LLC, a Kentucky limited liability company, or another affiliated or related entity of Aventurine One, LLC (the "Company"), intends to provide affordable housing in the City; and

WHEREAS, the Company has requested that the City assist it in financing the acquisition of the historic Norcutt Mill and the constructing, renovating and equipping therein of a qualified residential rental project to be known as Norcutt Mill, consisting of 128 units and located at 31 White Street NW in the City (the "Development"); and

WHEREAS, the Company has described to the City the benefits of the Development to the City and the State of North Carolina and has requested the City to agree to issue its multifamily housing revenue bonds in such amounts as may be necessary to finance the costs of acquiring, construction, renovating and equipping the Development; and

WHEREAS, the City is of the opinion that the Development is a facility that can be financed under the Act and that the financing of the same will be in furtherance of the purposes of the Act;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CONCORD:

1. It is hereby found and determined that the Development will involve the acquisition, construction, renovation and equipping of a multifamily housing facility, and that therefore, pursuant to the terms and subject to the conditions hereinafter stated and the Act, the City agrees to assist the Company in every reasonable way to issue bonds to finance the acquisition, construction, renovation and equipping of the Development, and, in particular, to undertake the issuance of the City's multifamily housing revenue bonds (the "Bonds") in an amount now estimated not to exceed Twenty-Seven Million Dollars ($27,000,000) to provide all or part of the cost of the Development.

2. The City intends that the adoption of this resolution be considered as "official action" toward the issuance of the Bonds within the meaning of the regulations issued by the Internal Revenue Service pursuant to Section 1.150-2 of the Treasury Regulations issued under the Internal Revenue Code of 1986, as amended (the "Code").

3. The Bonds shall be issued in such series and amounts and upon such terms and conditions as are mutually agreed upon between the City and the Company. The City and the Company shall enter into

a "financing agreement" pursuant to the Act for a term and upon payments sufficient to pay the principal of, premium if any, and interest on the Bonds and to pay all of the expenses of the City in connection with the Bonds and the Development. The Bonds will be issued pursuant to an indenture or security agreement between the City and a trustee (the "Trustee") or the bondholder which will set forth the form and terms of the Bonds and will assign to the Trustee for the benefit of the holders of the Bonds, or directly to the bondholder, the City's rights to payments under the financing agreement, except the City's right to payment of fees and expenses and indemnification. The Bonds shall not be deemed to constitute a debt or a pledge of the faith and credit of the State of North Carolina or any political subdivision or agency thereof, including the City, but shall be payable solely from the revenues and other funds provided under the proposed agreements with the Company.

4. The City hereby authorizes the Company to proceed, upon the prior advice, consent and approval of bond counsel and the City's counsel, to obtain approvals in connection with the issuance and sale of the Bonds and to obtain an allocation of a sufficient amount of the State of North Carolina's "private activity bond limit", as required by Section 146 of the Code and as defined in Section 146 of the Code, for the Bonds.

5. It having been represented to the City that it is desirable to proceed with the acquisition, construction, renovation and equipping of the Development, the City agrees that the Company may proceed with plans for such acquisition, construction, renovation and equipping, enter into contracts for the same, and take such other steps as it may deem appropriate in connection therewith, provided that nothing herein shall be deemed to authorize the Company to obligate the City without its written consent in each instance to the payment of any monies or the performance of any act in connection with the Development and no such consent shall be implied from the City's adoption of this resolution. The City agrees that the Company may be reimbursed from the proceeds of the Bonds, if and when issued, for all qualifying costs so incurred as permitted by Treasury Regulations Section 1.150-2.

6. All obligations hereunder of the City are subject to the further agreement of the City and the Company to terms for the issuance, sale and delivery of the Bonds and the execution of a financing agreement, indenture or security agreement and other documents and agreements necessary or desirable for the issuance of the Bonds. The City has not authorized and does not authorize the expenditure of any funds or monies of the City from any source other than the proceeds of the Bonds. All costs and expenses in connection with the financing and the acquisition, construction, renovation and equipping of the Development, including the reasonable fees and expenses of the City's counsel, bond counsel and the agent or underwriter for the sale of the Bonds, shall be paid from the proceeds of the Bonds or by the Company, but if for any reason the Bonds are not issued, all such expenses shall be paid by the Company and the City shall have no responsibility therefor. It is understood and agreed by the City and the Company that nothing contained in this resolution shall be construed or interpreted to create any personal liability of the officers or council members from time to time of the City.

7. The officers of the City are hereby authorized and directed to take all actions in furtherance of the resolution and the issuance of the Bonds.

8. The City hereby approves McGuireWoods LLP, Raleigh, North Carolina, to act as bond counsel for the Bonds.

9. This resolution shall take effect immediately.

Council member _____ moved the passage of the foregoing resolution and Council member _____ seconded the motion, and the resolution was passed by the following vote:

Ayes:_____

Nays:_____

Not voting:_____

* * * * * * *

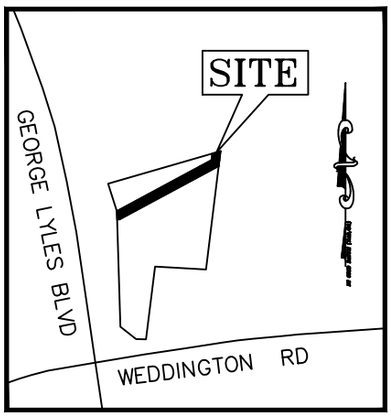
I, Kim Deason, City Clerk to the City of Concord, North Carolina, DO HEREBY CERTIFY that the foregoing is a true and complete copy of so much of the proceedings of the City Council for the City of Concord, North Carolina, at a regular meeting duly called and held on April 10, 2025, as it relates in any way to the resolution hereinabove set forth, and that such proceedings are recorded in the minutes of the City Council.

WITNESS my hand and the seal of the City Council of the City of Concord, North Carolina, this 10th day of April, 2025.

(SEAL)

_____
Kim Deason, City Clerk
City of Concord, North Carolina

EXHIBIT A



VICINITY MAP
NO SCALE

CERTIFICATE OF SURVEY AND ACCURACY

STATE OF NORTH CAROLINA, CABARRUS COUNTY

I, JUSTIN E. SILVA, CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION BASED ON THE DEED DESCRIPTIONS, AS NOTED HEREON; THAT THE RATIO OF CLOSURE IS 1:10,000+; THAT THE BOUNDARIES NOT SURVEYED ARE SHOWN AS BROKEN LINES PLOTTED FROM INFORMATION FOUND IN THE DEEDS REFERENCED HEREON AND THAT THIS MAP WAS PREPARED IN ACCORDANCE WITH GENERAL STATUTE 47-30.2, AS AMENDED.

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS THE 14th DAY OF NOVEMBER, A.D., 2024.

Justin E. Silva

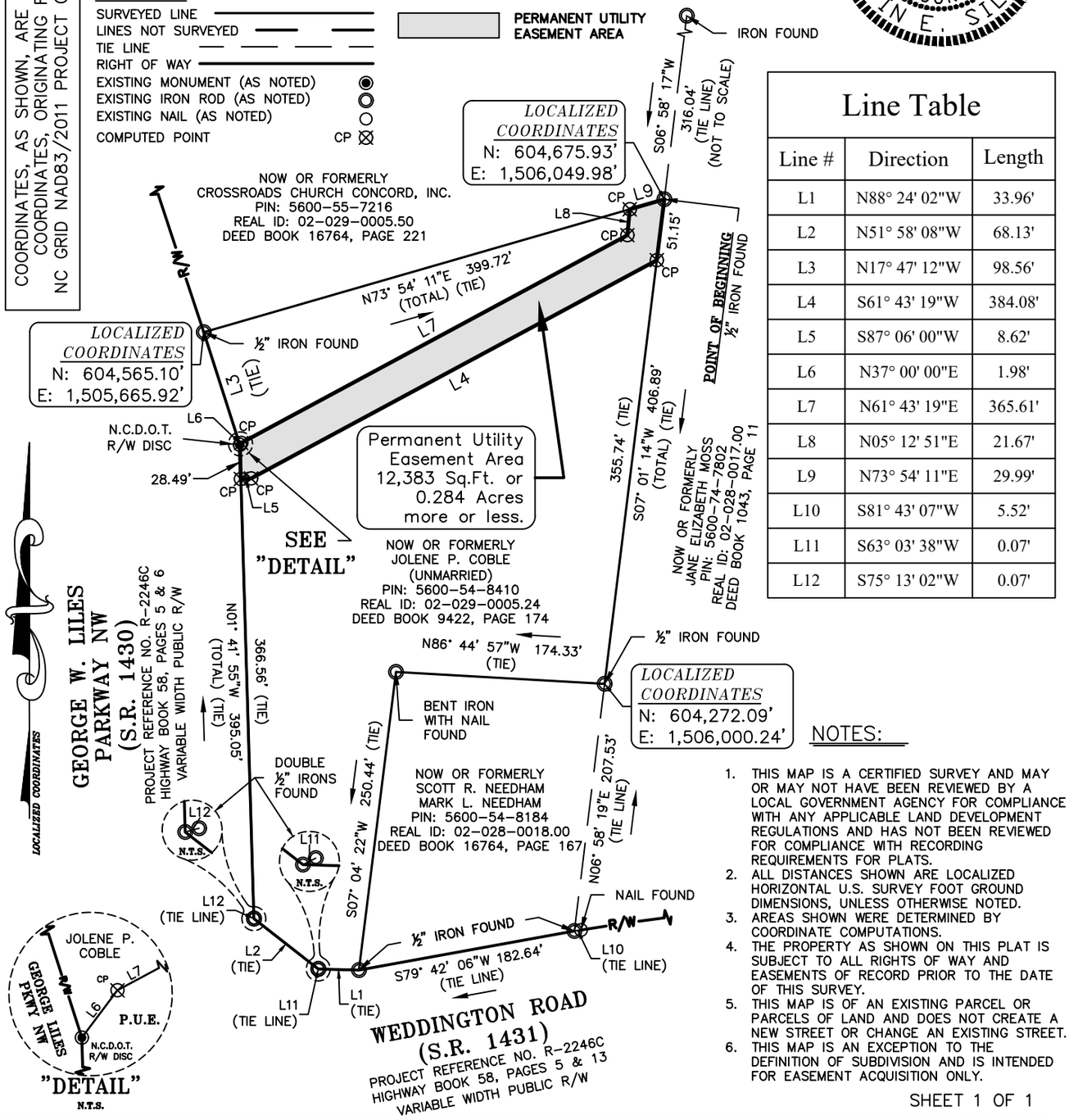
JUSTIN SILVA
PROFESSIONAL LAND SURVEYOR
NORTH CAROLINA REG. NO. L-5375

NORTH CAROLINA PROFESSIONAL SEAL L-5375 LAND SURVEYOR JUSTIN E. SILVA

COORDINATES, AS SHOWN, ARE GROUND COORDINATES, ORIGINATING FROM NC GRID NAD83/2011 PROJECT CONTROL.

LEGEND:

- SURVEYED LINE
- LINES NOT SURVEYED
- TIE LINE
- RIGHT OF WAY
- EXISTING MONUMENT (AS NOTED)
- EXISTING IRON ROD (AS NOTED)
- EXISTING NAIL (AS NOTED)
- COMPUTED POINT CP
- PERMANENT UTILITY EASEMENT AREA



Line Table

Line #	Direction	Length
L1	N88° 24' 02"W	33.96'
L2	N51° 58' 08"W	68.13'
L3	N17° 47' 12"W	98.56'
L4	S61° 43' 19"W	384.08'
L5	S87° 06' 00"W	8.62'
L6	N37° 00' 00"E	1.98'
L7	N61° 43' 19"E	365.61'
L8	N05° 12' 51"E	21.67'
L9	N73° 54' 11"E	29.99'
L10	S81° 43' 07"W	5.52'
L11	S63° 03' 38"W	0.07'
L12	S75° 13' 02"W	0.07'

NOTES:

1. THIS MAP IS A CERTIFIED SURVEY AND MAY OR MAY NOT HAVE BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.
2. ALL DISTANCES SHOWN ARE LOCALIZED HORIZONTAL U.S. SURVEY FOOT GROUND DIMENSIONS, UNLESS OTHERWISE NOTED.
3. AREAS SHOWN WERE DETERMINED BY COORDINATE COMPUTATIONS.
4. THE PROPERTY AS SHOWN ON THIS PLAT IS SUBJECT TO ALL RIGHTS OF WAY AND EASEMENTS OF RECORD PRIOR TO THE DATE OF THIS SURVEY.
5. THIS MAP IS OF AN EXISTING PARCEL OR PARCELS OF LAND AND DOES NOT CREATE A NEW STREET OR CHANGE AN EXISTING STREET.
6. THIS MAP IS AN EXCEPTION TO THE DEFINITION OF SUBDIVISION AND IS INTENDED FOR EASEMENT ACQUISITION ONLY.

SHEET 1 OF 1

PLAT PREPARED BY:

THE CITY OF CONCORD
ENGINEERING DEPARTMENT
635 ALFRED BROWN JR. COURT, SW
CONCORD, N.C. 28026-0308
(704) 920-5420 FAX (704) 786-4521
WWW.CONCORDNC.GOV/ENGINEERING

DRAWN BY:	CHECKED BY:	REVISED:
JES	DMM	

EASEMENT PLAT

CROSSING THE PROPERTY OF:
JOLENE P. COBLE

NO PHYSICAL ADDRESS ASSOCIATED WITH THIS PROPERTY
DEED BOOK 9422, PAGE 174; PIN: 5600-54-8410
REAL ID: 02-029-0005.24
No. 2 TOWNSHIP OF CABARRUS COUNTY, N.C.
SCALE: 1"= 120' DATE: NOV 14, 2024

120 0 60 120 240

G:\ENG\ENGINEERING PROJECTS\PROJECTS\2023\030 LAUREL PARK PUMP STATION ELIM\SURVEY\DWG FILES\2023-030 LAUREL PUMP STATION ELIMINATION - NEEDHAM EASEMENT PLAT.DWG

RESOLUTION AUTHORIZING NEGOTIATED PURCHASE
OR EMINENT DOMAIN TO ACQUIRE PROPERTY

WHEREAS, the City Council for the City of Concord, North Carolina, hereby determines that it is necessary in the public interest to acquire the following property interests owned by Jolene P. Coble (50% Undivided Interest), Scott R. Needham (25% Undivided Interest), and Mark L. Needham (25% Undivided Interest) as identified and defined below.

Permanent Utility Easement Description

Lying and being in the City of Concord, No. 2 Township, Cabarrus County, North Carolina, and crossing a 3.18 Acres (more or less) parcel of real property identified as being PIN: 5600-54-8410, Tax ID: 02-029-0005.24 of Cabarrus County, North Carolina and being more particularly described as follows:

Beginning at an existing 1/2" IRON ROD FOUND at the common corner of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) and Deed Book 16764, Page 221 (PIN: 5600-55-7216) (Real ID: 02-029-0005.50), said corner also lying along the westerly line of Deed Book 1043, Page 11 (PIN: 5600-74-7802) (Real ID: 02-028-0017.00), said 1/2" IRON ROD FOUND having Localized Ground Coordinates of N: 604,675.93, E: 1,506,049.98 and being the POINT OF BEGINNING (POB) of the variable width Permanent Utility Easement to be described herein; thence leaving the POINT OF BEGINNING (POB) and running along line common to the easterly line of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) and the westerly line of said Deed Book 1043, Page 11 (PIN: 5600-74-7802) (Real ID: 02-028-0017.00)

1) South 07°01'14" West 51.15 feet to a Computed Point; thence leaving said common line of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) and Deed Book 1043, Page 11 (PIN: 5600-74-7802) (Real ID: 02-028-0017.00)

2) South 61°43'19" West 384.08 feet (L4) crossing through the land of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) to a Computed Point; thence

3) South 87°06'00" West 8.62 feet (L5) continuing crossing through the land of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) to a Computed Point situated along the line common to the westerly line of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) and the easterly Right-of-Way line of GEORGE LILES PARKWAY NW (S.R. 1430) Highway Book 58, Pages 5 & 6, a variable width Public R/W; thence

4) North 01°41'55" West 28.49 feet along said common line to a N.C.D.O.T. R/W Disc at a corner common to said Deed and said R/W; thence leaving said common corner

5) North 37°00'00" East 1.98 feet (L6) crossing through the land of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) to a Computed Point; thence

6) North 61°43'19" East 365.61 feet (L7) continuing crossing through the land of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) to a Computed Point; thence

7) North 05°12'51" East 21.67 feet (L8) continuing crossing through the land of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) to a Computed Point situated along the line common to the northerly line of said Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) and the southerly line of said Deed Book 16764, Page 221 (PIN: 5600-55-7216) (Real ID: 02-029-0005.50); thence

8) North 73°54'11" East 29.99 feet to a (L9) along said common line to Deed Book 9422, Page 174 (PIN: 5600-54-8410) (Real ID: 02-029-0005.24) and said Deed Book 16764, Page 221 (PIN: 5600-55-7216) (Real ID: 02-029-0005.50) to the Point of Beginning and containing 12,383 square feet or 0.284 acres of land, more or less, as shown on map titled, “Easement Plat Crossing the Property of Jolene P. Coble, et al.,” dated November 14, 2024 by the City of Concord Engineering Department and is further described on Exhibit A.

WHERAS, the permanent utility easement is a portion of PIN 5600-54-8410, Tax ID No. 02-029-0005.24 and is owned by Jolene P. Coble (50% undivided interest), Mark L. Needham (25% undivided interest), and Scott R. Needham (25% undivided interest) and is being acquired for the purpose of the construction of a wastewater utility line located near George W. Liles Parkway NW & Weddington Road.

WHEREAS, representatives of the City of Concord are in negotiation with the above-stated owners to acquire the above-described properties by negotiated conveyance.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CONCORD, THAT:

The City of Concord will acquire by condemnation or negotiated conveyances for the purposes stated above the property and interests therein described above to the Resolution.

The City Attorney is authorized and directed to acquire by negotiated offer or, in the alternative, institute the necessary proceedings under Chapter 40A of the North Carolina General Statutes, to acquire the properties described above.

Adopted this _____ day of April, 2025.

ATTEST:

CITY COUNCIL
CITY OF CONCORD
NORTH CAROLINA

By: _____
Kim J. Deason, City Clerk

By: _____
William “Bill” Dusch, Mayor

[SEAL]

Prepared by:
Jazmyn Parkan
Shepard & Bright Law
8520 Cliff Cameron Drive, Ste 190
Charlotte, NC 28269

AMENDMENT TO CONDITIONS, RESTRICTIONS, AND AFFORDABILITY STANDARDS FOR CITY OF CONCORD RESTRICTIONS ON WEBUILD CONCORD, A NORTH CAROLINA NON-PROFIT CORPORATION IN DEED BOOK 16264, PAGE 139, CABARRUS COUNTY PUBLIC REGISTRY

THIS AMENDMENT TO CONDITIONS, RESTRICTIONS, AND AFFORDABILITY STANDARDS FOR CITYOF CONCORD RESTRICTIONS ON WEBUILD CONCORD, A NORTH CAROLINA NON-PROFIT CORPORATION IN DEED BOOK 16264, PAGE 139, CABARRUS COUNTY PUBLIC REGISTRY (this "Amendment") is made by the City of Concord, a North Carolina Municipal Corporation (the "Declarant"). This Amendment is made by Declarant pursuant to the terms and authority provided in Section 14 of the Declaration recorded as Exhibit B to the North Carolina Special Warranty Deed recorded in Deed Book 16264, Page 139, Cabarrus County Public Registry and titled: Conditions, Restrictions, and Affordability Standards.

RECITALS

WHEREAS, Section 14 of the Declaration states that the Declarant may amend the Declaration prior to the end of the Retention Period, and the Retention Period has not yet ended;

WHEREAS, Section 14 of the Declaration states that any amendment shall be by written executed by the City and the Owner, or their successors or assigns; and

WHEREAS, Declarant and Owner desire to amend provisions in the Declaration related to the Affordability Period.

AMENDMENT

NOW THEREFORE, Declarant and New Owner hereby amends the Declaration as follows:

1. The Recitals stated above are incorporated herein by reference in their entirety.
2. Capitalized terms in the Amendment not otherwise defined herein shall have the same meaning as provided in the Declaration.
3. Section 1, Affordability, is hereby amended and replaced as follows for the particular property of:

   For purposes of this instrument, the term "affordable housing" means housing that serves households which have annual gross income less than, or equal to, eighty percent (80%) of the area median income (AMI) as determined by the United States Department of Housing and Urban Development (HUD) in effect for the City of Concord

and Cabarrus County, North Carolina at the time of the conveyance. Unless the City agrees otherwise, at least seventy-five percent (75%) of all housing units sold or leased on the Properties must qualify as affordable housing. The remaining twenty-five percent (25%) of the housing units may be sold or leased at market or workforce rates, which properties are sold with this twenty-five percent (25%) exception shall be within the sole discretion of WeBuild Concord, a North Carolina Non-Profit Corporation.

4. Except as expressly modified in this Amendment, every term and provision of the Declaration is ratified and remains in full force and effect.

IN WITNESS WHEREOF, Declarant has caused this Amendment to be executed by its duly authorized signatory on the day and year set forth below.

DECLARANT
City of Concord,
A North Carolina Municipal Corporation

By:_____
Name:_____
Title:_____

STATE OF_____

COUNTY OF_____

I certify that the following person personally appeared before me this day, acknowledging to me that he/she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated: _____ (Name), who is the _____ (title) of the City of Concord.

Witness my hand and official seal this _____ day of _____, 20___.

_____
Notary Public
My Commission Expires: _____

OWNER

By:_____
Name:_____
Title:_____

STATE OF_____
COUNTY OF_____

I certify that the following person personally appeared before me this day, acknowledging to me that he/she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated: _____ (Name), who is the _____ (title) of WeBuild Concord.

Witness my hand and official seal this _____ day of _____, 20___.

_____
Notary Public
My Commission Expires: _____

FILED ELECTRONICALLY
CABARRUS COUNTY NC
M. WAYNE NIXON

FILED	Oct 31, 2022
AT	03:19:00 PM
BOOK	16264
START PAGE	0139
END PAGE	0145
INSTRUMENT #	31569
EXCISE TAX	$0.00

Excise Tax EXEMPT

Recording Time, Book and Page

NORTH CAROLINA SPECIAL WARRANTY DEED

Tax Lot No.

Parcel Identifier No. 5620-92-1802

Verified by _____ by

County on the _____ day of _____,

Mail after recording to **GRANTEE**
This instrument was prepared by **RYAN C. HAWKINS, Ferguson Hayes Hawkins, PLLC**

Brief Description for the index **LINCOLN STREET**

THIS DEED made this 28 day of **OCTOBER, 2022,** by and between

GRANTOR	GRANTEE
CITY OF CONCORD, **a North Carolina municipal corporation** Mailing Address: PO Box 308 Concord, NC 28026-0308	**WEBUILD CONCORD,** **a North Carolina non-profit corporation** Mailing Address: 4 Barbrick Avenue SW Suite 10 Concord, NC 28025

Enter in appropriate block for each party: name, address, and, if appropriate, character of entity, e.g., corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated in **CABARRUS** County, North Carolina and more particularly described as follows:

SEE ATTACHED EXHIBIT A

The property hereinabove described was acquired by Grantor by instrument recorded in Book 4975, Page 1.

All or a portion of the property herein conveyed does not include the primary residence of a Grantor.

A map showing the above described property is recorded in Plat Book 5, Page 80.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all privileges and appurtenances thereto belonging to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor has done nothing to impair such title as Grantor received, and Grantor will warrant and defend the title against the lawful claims of all persons claiming by, under or through Grantor, except for the exceptions hereinafter stated.

Title to the property hereinabove described is subject to the following exceptions:

SUBJECT TO all easements, restrictions, conditions, protective covenants, utilities, rights of way, zoning laws and all ordinances of record.
SUBJECT TO easements and setback lines as shown on the recorded plat.
SUBJECT TO the restrictions as set forth on the attached EXHIBIT B.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officers and its seal to be hereunto affixed by authority of its Board of Directors, the day and year first above written.

CITY OF CONCORD
a North Carolina municipal corporation

By: _____ (SEAL)
Name: Lloyd Wm. Payne, Jr.
Title: City Manager

ATTEST:

By: _____ (SEAL)
Name: Kim J. Deason
Title: City Clerk

State of NORTH CAROLINA
County of CABARRUS

I, Leslie Jenkins, a Notary Public of Rowan County and State, do hereby certify that Kim J. Deason personally appeared before me this day and acknowledged that she is the City Clerk of the City of Concord and that by authority duly given and as the act of the municipal corporation, the foregoing instrument was signed in its name by Lloyd Wm. Payne, Jr., as its City Manager, sealed with its corporate seal and attested by her as it City Clerk.

Witness my hand and notarial seal, the 28 day of October 2022.

(Affix Official/Notarial Seal)

LESLIE JENKINS NOTARY PUBLIC ROWAN COUNTY, NC

_____, Notary Public

My Commission Expires: 9-20-26

EXHIBIT "A"

(legal description for 338 Lincoln St SW, Concord, NC)
File 22-2173dgB

Lying and being in the Number Twelve (12) Township, Cabarrus County, North Carolina and on the Western of Lincoln Street and being Lots 58-69 and Lots 87-82 and a part of Lot 88 and Lots 70-74 of Lincoln Park as found in Map Book 5, at Page 80 of the Cabarrus County Register of Deeds and hereby described as follows:

BEGINNING at a pin at the corner of Melrose and Lincoln Street and running with the Northern side of Melrose Avenue, North 82-50-33 West 312.96 feet to a point in the line of Lot 88; thence splitting Lot 88, North 07-09-27 East 150.00 feet to a point in the rear of Lot 88; thence with a portion of Lot 88 and Lot 87, South 82-50-33 East 37.50 feet to a point, corner of Lots 87 and 86 and 74; thence with Lot 74 North 07-09-27 East 150.00 feet to a point in the Southern side of Malvern Avenue, SW; thence with the Southern side of Malvern Avenue South 82-50-33 East 274.55 feet to the intersection of Malvern and Lincoln; thence with the Western side of Lincoln Street South 06-59-01 West 300.00 feet to the point of BEGINNING, containing 2.02 acres, more or less as surveyed by Gaylon L. Kelly RLS, dated October 1, 2003.

Being the same property designated as Tract One in the deed recorded in Deed Book 4975, Page 1, Cabarrus County Registry.

EXHIBIT B

Conditions, Restrictions, and Affordability Standards

THIS DECLARATION OF DEED RESTRICTIONS (the "Declaration"), made and entered into on the 28 day of October, 2022 by and between WEBUILD CONCORD (a nonprofit corporation) (the "Owner") for the benefit of and enforceable by the City of Concord a North Carolina municipal corporation (the "City") as designated by North Carolina General Statute §157-9 permits the City Council of the City of Concord in its role as Housing Authority to sell real property by negotiated offer after the receipt of an Offer to Purchase Property.

WHEREAS, the Owner is the owner of those certain tracts of real property as more particularly described on Exhibit A attached hereto and incorporated herein by reference (the "Property"); and

WHEREAS, City has sold to Owner these Affordable Housing Properties,; and

WHEREAS, the Properties are intended for construction to provide assistance for affordable residential housing and to restrict the use of the Property to provide affordable housing for a minimum of forty (40) years pursuant to the terms provided below; and

WHEREAS, as a condition of the City approving the below market value Offer to Owner, City has required, and Owner has agreed to restrict the Property as set forth herein; and

WHEREAS, the City has defined "affordability" in the City of Concord to mean any housing that serves people in the 80% AMI range and below based upon the most current limits as established by the US Department of Housing and Urban Development for the City of Concord/Cabarrus County.

WHEREAS, City desires to ensure the attractiveness of the Property and to prevent any future impairment thereof; to prevent nuisances, to preserve, protect and enhance the values, and City deems it advisable to subject the Property to the covenants, conditions, restrictions, and easements hereinafter set forth ("Covenants");

NOW THEREFORE, the City declares that the Property is and shall be owned, held, transferred, sold, conveyed and occupied subject to the following covenants, conditions, restrictions and easements, which shall run with the title to Property and be binding upon and insure to the benefit of all owners ("Homeowner/Lot Owner") thereof and their heirs, personal representatives, successors and assigns, in consideration of the mutual covenants and understandings set forth herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Owner hereby represents, covenants, warrants and agrees:

1. Affordability. For purposes of this instrument, the term "affordable housing" means housing that serves households which have annual gross income less than, or equal to, eighty percent (80%) of the area median income (AMI) as determined by the United States Department of Housing and Urban Development (HUD) in effect for the City of Concord and Cabarrus County, North Carolina at the time of the conveyance. Unless the City agrees otherwise, at least seventy-five percent (75%) of all housing units sold or leased on the Properties must qualify as affordable housing.

2. Residential Purposes Only. Each lot on the Properties shall be used exclusively for single-family, residential purposes; and garages, carports, and driveways shall be used exclusively for the parking of passenger automobiles or light (noncommercial) vans or trucks, no trade or business of any kind shall be conducted upon a lot or any part thereof. No lot or portion thereof may be used for transient residential purposes.

3. Exterior Maintenance. Except as otherwise specifically provided herein, the Owner shall have the duty and responsibility, at Owner's sole cost and expense, to keep the Property owned by such Owner and/or Homeowners in a well-maintained, safe, clean and attractive condition at all times and to comply with all governmental laws and regulations. Such maintenance includes, but is not limited to, the following

a) Prompt removal of all litter, trash, refuse and waste;
b) Keeping all sediment resulting from land disturbance or construction confined to the respective Owner's lot;

In addition, such maintenance as to improved Lots shall include, but shall not be limited to, the following:

c) Lawn mowing on a regular basis;
d) Tree and shrub pruning;
e) Keeping lawn and garden areas alive and weeded;
f) Removing and replacing any dead plant material;
g) Watering by means of a lawn sprinkler system and/or hand watering as needed;
h) Keeping exterior lighting and mechanical facilities in working order;
i) Keeping parking areas and driveways in good repair;
j) Repainting of improvements as needed;
k) Repair of damage and deterioration to improvements, it being understood and agreed that if any improvements are damaged or destroyed by fire or other casualty, then within six (6) months, or as soon as practicable (with the presentation of proof of filing of an insurance claim) following the date such damage or destruction occurs, the Owner and/or Homeowner of the lot on which such improvements are situated must repair and restore such damaged improvements (in accordance with plans and specifications approved by the City and otherwise in accordance with the terms and provisions of this Declaration) or remove such damaged improvements and restore the lot to its condition existing prior to the construction of such improvements;
l) No trash, rubbish, stored materials, wrecked or inoperable vehicles, or similar unsightly items shall remain on any lot outside an enclosed structure except however, that the foregoing shall not be construed to prohibit temporary deposits of trash, rubbish, or similar items, or garbage receptacles for the purpose of removal in accordance with the City Code of Ordinances Chapter 46 Solid Waste; and
m) No furniture intended for interior use shall be permitted outdoors.

4. Garage. Garages shall be built of materials that match or are similar to the materials of the dwelling served by the garage, Garages can be detached (free standing) or attached to the existing home provided that no part of the garage structure may be located in front a line drawn from a point on the house located halfway between the front corner of the house and the rear corner of the house perpendicularly to the closest side property line. The location of the garage must comply with all setbacks for the district in which the property is located, as reflected in the latest version of the City of Concord Unified Development Ordinances, in force at the time of construction of a garage. Prior to construction, the Owner must receive approval of the design and materials from the City.

5. Outbuildings and Similar Structures. No improvements or structures of temporary nature shall be erected, altered, or maintained on any lot. Garages and single-family, owner occupied (non- rental) detached dwellings are not temporary structures. No trailer, shed, tent, garage, carport or any other structure shall be used as a residence either temporarily or permanently. Accessory buildings will be permitted only if in compliance with the City of Concord Unified Development Ordinance in force at the time of proposed construction or erection of an accessory building. Said structure or structures shall be constructed in similar architectural style as the dwelling. Steel or other metal siding on accessory buildings is not permitted. No television satellite dishes shall be erected on any lot, except that a television satellite dish not exceeding 24 inches in diameter that is attached to the house and is not visible from the street front is permitted. No radio or television antenna shall be allowed on the roof of any house or structure located on a lot and no separate towers for antenna shall be erected on any lot. Ham radio towers are allowed as provided by the N.C. General Statutes and/or FCC regulation.

6. Pools. No above ground swimming pools are permitted on any lot, except for temporary children's pools of eight (8) feet or less in diameter.

7. Animals and Pets. No animal, livestock or poultry of any kind shall be raised, bred, pastured, boarded, or maintained on any lot, except household pets which may be kept thereon in reasonable numbers as pets for the sole pleasure and use of the occupants, but not for any commercial use or purpose. All household pets shall be kept under the Owner's and/or Homeowner's control so as not to be a nuisance to other Homeowners/Lot Owners.

8. Parking. Parking of motorized vehicles or non-motorized trailers are not permitted off driveways, in the front yards, side yards, or on sidewalks. Vehicles are to be parked on driveways only.

9. Nuisances. No offensive or illegal activity shall be carried on upon any lot, nor shall anything be done thereon that is or may become an annoyance or nuisance to any other Owner and/or Homeowner; No lot shall be used in whole or in part for the storage of any property or thing that will cause such a lot to appear in an unclean or untidy condition or that is unsightly; nor shall any substance, thing or material be kept upon any lot that will emit a foul odor or that will cause any noise that will or might disturb the peace and quiet of the occupants and surrounding lots; No noxious or offensive trade or activity shall be carried on upon the property, nor may anything be done thereon which may be, or become, a detriment, annoyance, or nuisance to the neighborhood.

10. Easements/Right of Entry. An easement on each lot of the Property is hereby reserved by the City along, over, under and upon a strip of land ten feet in width parallel and contiguous to the front, rear and side lot lines of each lot to provide for installation, maintenance, construction and operation of drainage facilities and utility services lines to, from or for each of the lots of the Property.

11. Enforcement. The covenants and restrictions herein are for the benefit of any and all Owners and Homeowners. If an Owner or Homeowner violates any covenant and/or restriction of this Declaration, the City has authority to enforce this Declaration by entering upon the Property to cure such violation, if the violation has not been corrected within thirty (30) days of sending written notice of the violation to said Owner or Homeowner by first class mail, postage pre-paid, to the Owner's or Homeowner's last known address as maintained by the Cabarrus County Tax Assessor and then holding a "public hearing" on the Owner's or Homeowner's Property. The Owner or Homeowner on which such work is performed shall be liable for the cost of such work. If litigation ensues, and the City is the Prevailing Party, the Owner or Homeowner agrees to pay all costs of litigation, including reasonable attorney fees. All sums due under this paragraph shall become a lien upon the property enforceable: under N.C. Gen. Stat. § 160A-193.

12. Term. This Declaration shall remain in full force and effect for a period of **FORTY (40) YEARS** from the date of the Owner's acquisition of the Properties ("Retention Period"). In the case of a sale, transfer, assignment of title or deed, or cash out refinance of the Property by the Owner or Homeowner during the Retention Period, the City shall be paid the value of the land as of the date of this document as assessed by Cabarrus County Tax Assessor reduced on a pro rata share unless one of the following exceptions applies:

(i) in the case of a sale, transfer or assignment of a Property, the subsequent purchaser, transferee, or assignee is a low to moderate income household as defined by HUD regulations;

(ii) in the case of a non-cash out refinance, following the refinancing, the Property continues to be subject to a deed restriction or other legally enforceable retention agreement or mechanism as described in this paragraph.

The City reserves the right to terminate the Declaration in the event of transfer of title by foreclosure or by deed in lieu of foreclosure, subject to automatic revival if, at any time during the remainder of the original Retention Period, the owner of record immediately prior to the termination event, or any entity that includes such former owner or those with whom the former owner has or had family or business ties, obtains an ownership interest in the Project or the Property.

13. Covenants to Run with the Land. The covenants, reservations and restrictions set forth herein (i) shall be deemed covenants running with the land and, shall pass to and be binding upon Owner, the Owner's heirs, successors and/or assigns in title to the Property and all subsequent owners or operators of the Property and (ii) are not merely personal covenants of the Owner. The benefits shall inure to the City and any present or prospective tenant of the Property during the Retention Period. The Owner hereby agrees that any and all requirement of the laws of the State of North Carolina to be satisfied in order for the provisions of this Agreement to constitute deed restrictions and covenants running with the Property and which touch and concern the Property, shall be deemed to be satisfied in full, and that any requirements of privy of estate are intended to be satisfied, and that an equitable servitude in the form of a negative easement has been created to insure that these restrictions run with the land. Each and every contract, deed or other instrument hereafter executed covering or conveying any Property or any portion thereof shall conclusively be held to have been executed, delivered and accepted subject to such covenants, reservations and restrictions, regardless of whether such covenants, reservations and restrictions are set forth in such contract, deed or other instruments. If a portion or portions of the Properties are conveyed, all of such covenants, reservations and restrictions shall run to each portion of the Properties.

14. Amendment. This Declaration shall not be amended or, except as otherwise provided herein, terminated except by a written instrument, executed by the City and the Owner, or their successors or assigns, which amendment shall be duly recorded in the Office of the Register of Deeds for the county in which the Properties are located.

15. Law Controlling. This Declaration shall be construed and controlled by and under the laws of the State of North Carolina. Invalidation of any of these covenants by judgment or court order shall in no way effect of the other provisions, which shall remain in full force. The failure by anyone to enforce any of the provisions contained herein shall not be interpreted as implying consent to any such violations.

16. Construction. Unless the context clearly requires otherwise, as used in this Declaration words of the masculine, feminine or neuter gender shall be construed to include any other gender when appropriate and words of the singular number shall be construed to include the plural number, and vice versa, when appropriate. This Declaration and all the terms and provisions hereof shall be construed to effectuate the purposes set forth herein and to sustain the validity hereof.

17. Headings. The titles and headings of the sections of this Declaration have been inserted for convenience of reference only and are not to be considered a part hereof and shall not in any way modify or restrict any of the terms or provisions hereof, nor be considered or given any effect in construing this Declaration or any provisions hereof, or in ascertaining intent if any question of intent shall arise.

18. Notices. Any notice required to be sent to any Owner under the provisions of this Declaration shall be deemed to have been properly sent when mailed by ordinary mail, postage prepaid, to the last known address of the person at the time of such mailing.

Southeastern Consulting Engineers, Inc.

March 19, 2025

Mr. Alex Burris
Director of Electric Systems
City of Concord
P. O. Box 308
Concord, North Carolina 28025

Ref.: Substation N – Site Work
Bid Recommendation

Dear Alex:

The City received sealed proposals at 2:00 p.m. on March 18, 2025, from four contractors for the sitework and grading at Substation N located on Vinehaven Drive. The four bids were reviewed for compliance with the specifications and relevant project experience. A bid tabulation is attached.

The low bid was submitted by Carolina Siteworks, Inc. of China Grove, NC in the amount of $184,644.00. The Electric Department has worked with Carolina Siteworks on previous projects, and they have met our expectations.

We recommend that the City accept Carolina Siteworks, Inc.'s proposal in the amount of $184,644.00 and proceed with executing the contract documents. Please let us know if you have any questions or need any additional information.

Very Truly Yours,

SOUTHEASTERN CONSULTING ENGINEERS, INC.

By _____
Jerry L. Ford, Jr., P.E.
Sr. Design Engineer

Enc: Bid Tabulation

cc: Mrs. Andrea Cline
Mr. Ty Barbee
Mr. Caleb Greene

600 MINUET LANE P.O. BOX 240436 CHARLOTTE, NC 28224
PHONE: (704) 523-6045 FAX: (704) 523-8317

BID TABULATION

Site Work - Substation N

City of Concord
Concord, North Carolina

Bid Date: March 18, 2025
Time: 2:00 PM, EDT

Bidder	Carolina Site Works	Mugo Gravel & Grading	Draw Enterprises	Performance Managed Construction, Inc.		
All Costs for all Labor, Materials, Equipment, Supplies, Supervision, Insurance, other miscellaneous costs, profit and overhead, both direct & indirect, for completion of all Work.						
Total	$ 184,644.00	$ 197,365.00	$ 287,750.00	$ 395,900.00	$	$
Bid Bond	✓	✓	✓	✓		
Miscellaneous Unit Prices						
Unit Adder - Suitable Fill	$ 30.00 /Cu.Yd.	$ 20.00 /Cu.Yd.	$ 35.00 /Cu.Yd.	$ 50.00 /Cu.Yd.	$ /Cu.Yd.	$ /Cu.Yd.
Unit Adder - Additional Excavation	$ 28.00 /Cu.Yd.	$ 6.00 /Cu.Yd.	$ 25.00 /Cu.Yd.	$ 50.00 /Cu.Yd.	$ /Cu.Yd.	$ /Cu.Yd.
Unit Adder - Rock Excavation	$ 300.00 /Cu.Yd.	$ 275.00 /Cu.Yd.	$ 250.00 /Cu.Yd.	$ 250.00 /Cu.Yd.	$ /Cu.Yd.	$ /Cu.Yd.
Unit Adder - Additional Concrete, including forming, finishing, and reinforcing steel	$1,500.00 /Cu.Yd.	$ 16.00 /Cu.Yd.	$ 1,000.00 /Cu.Yd.	$ 500.00 /Cu.Yd.	$ /Cu.Yd.	$ /Cu.Yd.
Unit Adder - Slit Fencing	$ 3.50 /Per Ft. Installed	$ 5.25 /Per Ft. Installed	$ 6.00 /Per Ft. Installed	$ 5.00 /Per Ft. Installed	$ /Per Ft. Installed	$ /Per Ft. Installed
Unit Adder - Rock Removal from Site	$ 50.00 /Cu.Yd.	$ 50.00 /Cu.Yd.	$ 50.00 /Cu.Yd.	$ 100.00 /Cu.Yd.	$ /Cu.Yd.	$ /Cu.Yd.

CITY OF CONCORD
PURCHASING BID REVIEW AND ROUTING FORM

DATE: 03/202025

FORMAL BID: Yes

BID DATE: 03/18/2025

DEPARTMENT: Electric

BIDDERS	AMOUNT	DELIVERY
Carolina Site Works	$184,644.00	90 days
Mugo Gravel & Grading	$197,365.00	90 days
Draw Enterprises	$287,750.00	90 days
Performance Managed Const., Inc	$395,900.00	90 days

RECOMMENDATION: Carolina Site Works

LOW BIDDER: YES ☒ NO ☐ (IF NOT, DOCUMENTATION REQUIRED)

ADDED OPTIONS: _____ PRICE: _____

♦♦♦♦♦♦

FLEET SERVICES SIGNATURE (IF REQUIRED) _____

DEPARTENT HEAD: Alex Burris DATE: 3/20/2025

COMMENTS: _____

♦♦♦♦♦♦

ASSISTANT CITY MANAGER OR EXECUTIVE DIRECTOR OF OPERATIONS: LeDerick Blackburn Digitally signed by LeDerick Blackburn Date: 2025.03.20 14:47:48 -04'00' DATE: _____

COMMENTS: _____

♦♦♦♦♦♦

PURCHASING OFFICIAL: Ryan LeClear Digitally signed by Ryan LeClear Date: 2025.03.21 07:59:46 -04'00' DATE: _____

COMMENTS: _____

FINANCE DIRECTOR: Jessica Jones Digitally signed by Jessica Jones Date: 2025.03.21 11:06:42 -04'00' DATE: _____

COMMENTS: _____

♦♦♦♦♦♦

APPROVE AS RECOMMENDED: ☐ YES

CITY MANAGER: Lloyd Wm. Payne, Jr., ICMA-CM Digitally signed by Lloyd Wm. Payne, Jr., ICMA-CM Date: 2025.03.21 17:46:41 -04'00' DATE: _____

COMMENTS: _____

FIN/PUR/48
REVISED 05/11/2016

4030 Yancey Road, Charlotte, NC 28217
P.O. Box 33758, Charlotte, NC 28233
PHONE 704.969.2484 FAX 704.969.2480

CITI SCOPE PROPOSAL C23060R2

February 20, 2025

Mr. Anthony Allman
Water Resources
City of Concord, NC
Phone 704.920.5336
allmana@concordnc.gov

Re: Coddle Creek WTP and Hillgrove WTP – SCADA Upgrades

Dear Mr. Allman:

Thank you for the opportunity to present this proposal. The following tables show a detailed description of the materials and services we offer to furnish.

Materials

Qty		Description
2		SCADA software to support Server Redundancy, unlimited tags, email alarm notifications, historical Database (long term data recording), report generation (export to PDF or Excel) for the following applications: • Coddle Creek WTP • Hillgrove WTP including telemetry sites Each SCADA software package includes the following modules: • Ignition Platform • Perspective Module Unlimited Tags • OPC UA Server Module • Core Drivers (Allen Bradley, Modicon) • Alarm Notification Module via email • SQL Bridge Module • Tag Historian Module • Reporting Module • Redundant Licensing To minimize your capital expenditure, we have opted for you to supply the required hardware, including the SCADA workstations. We will configure and install the SCADA computers; however, if you prefer that we supply this equipment, we can do so under separate cover.

Services

Qty		Description
1		SCADA application to replace the existing and to provide the same functionality as the current FactoryTalk applications at the Coddle Creek and Hillgrove water treatment plants. Screen development will be performed after SCADA coordination meetings are conducted with your staff. These coordination meetings are very important as operations personnel will have input into how information is presented and how screen navigation is organized. We will commission the new SCADA in scheduled steps to minimize plants disruptions. All work activities will be coordinated with operations management.
1		Configuration and installation of SCADA workstations (to be supplied by you)
1		Setup and commissioning of new SCADA system

Services		
Qty		**Description**
1		SCADA coordination meeting
1		Operator training – 2 shifts / 1 day each plant

Materials (Adder 1)		
Qty		**Description**
1		SCADA software to support, unlimited tags, email alarm notifications, historical Database (long term data recording), report generation (export to PDF or Excel) for the following applications: • Second Tier application to display information from the Coddle Creek WTP and Hillgrove WTP facilities Each SCADA software package includes the following modules: • Ignition Platform • Perspective Module Unlimited Tags • OPC UA Server Module • SQL Bridge Module • Tag Historian Module • Reporting Module

Services (Adder 1)		
Qty		**Description**
1		SCADA application to provide Tier 2 visualization of the new SCADA applications of the Coddle Creek WTP and Hillgrove WTP facilities.
1		Configuration of Tier 2 SCADA workstation (to be supplied by you)
1		Setup and commissioning of new Tier 2 SCADA system
1		SCADA coordination meeting
1		Operator training

CITI Pricing Summary

Pricing for CITI scope of materials and services ***Coddle Creek WTP and Hillgrove WTP***	*Total =*	*$627,130*
Pricing for CITI scope of materials and services ***ADDER 1***	*Total =*	*$60,715*

TAXES ARE EXCLUDED

CITI Clarifications:

1. The scope of this proposal excludes all of the following:
   - Workstations for new SCADA applications;
   - PLC programming and OIT programming for existing equipment;
   - PLC program development software licenses;
   - Field wiring materials, power disconnect switches, conduits, junction boxes, and pull boxes;
   - Surge protection for existing field components and instruments or supplied by others;
   - Nametags for existing field components and instruments or supplied by others;
   - Building or work permits;
   - Demolition or relocation of existing instrumentation and controls equipment;

- Onsite supervision of equipment installation;
- Configuration or troubleshooting of existing field instrumentation and equipment;
- Installation of panels and field process components/instruments, field wiring and network cabling;
- Field wiring terminations of power and control wiring at panels, field instruments, and process components;
- Field terminations of fiber and copper communications network cabling unless specifically listed in CITI Inc's scope;
- Modifications to existing SCADA applications;
- Component inspections and startup for field process components/instruments and panels supplied by others;
- Materials and services not specifically listed in CITI Inc's scope.

2. Note that there is a 10% manufacturer's price increase for SCADA software purchased after April 2025.
3. External connection checks or loop testing will not be performed against field devices as they are assumed to be operational. The new SCADA application will be compared against the existing to verify that they match.
4. Alarm notifications by SMS are not included, but can be added at an additional cost. Please note that a cellular modem is required for SMS notifications at each facility.
5. It is assumed that the Tier 2 application will be developed based on the new SCADA applications developed under the base scope of this proposal.
6. The existing historical data must use your current licensing for viewing and reporting.
7. Windows and Ignition security updates are important to protect your computer from malicious attacks, we recommend the use of a Patch Management software for this purpose. Patch Management software is not included in our scope of materials but can be provided upon request under a different proposal.
8. The use of a network appliance, such as a firewall, is recommended to prevent unauthorized traffic to the local network. Network appliances and their configuration are not included in our scope of work but can be provided upon request under a different proposal.
9. Materials will be released for manufacture and shipment to the job site upon receipt of your authorization. Services should be fully deliverable in accordance with an agreed upon schedule within 20-26 weeks after receipt of your order and your authorization to release; however, delivery schedules are non-binding, and CITI Inc maintains the right to partial delivery of as materials become available. If the delivery of materials is delayed as a result of manufacturer supply chain issues or other factors beyond our control, CITI Inc shall not be liable for any additional costs or damages associated with such delays.
10. After completion of equipment installation, CITI Inc will begin the field services for commissioning. You will need to have qualified staff present during this testing.
11. All materials are warranted for 18 months after delivery, 12 months after completion of their respective acceptance testing, or 12 months after the original project completion date, whichever occurs first.
12. CITI Inc's insurance coverage is: general liability - $1,000,000/$2,000,000; auto liability - $1,000,000; excess liability - $1,000,000; and workers compensation - $1,000,000. If any additional coverage or endorsements are required, the charges for additions to CITI Inc's policy will be charged to you as an extra expense at actual cost times a multiplier of 1.15.
13. CITI Inc will retain all rights to Intellectual Property developed under this project and will grant the end user non-transferable rights to its use and modification. A copy of CITI Inc's privacy statement is available at www.CITI-INC.com.
14. This proposal is based on costs available to us on date of this proposal and is valid for 60 days. Due to supply chain cost volatility, CITI Inc reserves the right to escalate selling price prior to receipt of authorization for release for manufacture and delivery. Shipping is FOB factory, freight cost allowed. Unless stated elsewhere in this proposal, destination of all

shipments will be the designated project site. Payment terms for this project are net 30 days, contingent upon approved credit, after the date of each invoice. Payment to CITI Inc shall not be dependent on you being paid by any third parties. Materials that are delivered or approved for storage in CITI Inc's facility will be billed complete at time of delivery/storage. Services will be billed on a percentage completed.

15. CITI Inc will not provide any materials or services for this project prior receipt of an executed purchase order.
16. CITI Inc will accept a purchase order for this scope of supply subject to these clarifications and the attached CITI Inc "Conditions of Sale". A subcontract will not be accepted. The order will need to incorporate this proposal or specifically include within its body the listing of materials, services, and clarifications from this proposal so as to define CITI Inc's scope of supply and terms. All terms of CITI Inc's agreement must be specifically listed in the order. Assignment of order is subject to CITI Inc's written consent.
17. CITI Inc will apply taxes to all invoices for labor and materials as applicable. If a tax exemption is being claimed, all relevant exemption forms must be provided to CITI at the time the purchase order is issued. A completed NCDOR E-589CI Affidavit of Capital Improvement is needed if the work is to be taxed as a real property contract with respect a capital improvement to real property.

If you have any questions about this scope of supply, please call us. Thank you for your consideration.

CITI Inc.

Camilo Castaño
Project Manager

Attachment: CITI Inc Conditions of Sale

CITI, INC CONDITIONS OF SALE

1. **GENERAL**: Sales by CITI, INC, (herein CITI) are made solely under the conditions expressly set forth herein. Any proposed changes or exceptions to these conditions, or additional terms and conditions, included or referenced in Purchaser's order or acceptance of this offer, are hereby rejected by CITI, and shall be of no force or effect upon CITI unless expressly accepted in writing by CITI.

This Contract shall bind and inure to the benefit of Purchaser and CITI, as well as their respective successors and assigns; however, neither party may assign this Contract without prior written consent of the other.

Neither party shall be deemed to have waived its rights by failing to enforce any particular provision of this Contract.

If a court invalidates any portion of this Contract, the rest of this Contract shall remain valid and be construed as if not containing the invalidated provision.

North Carolina law shall govern the rights and obligations of the parties.
Either party may pursue any legal means available to resolve disputes or claims arising out of or relating to this Contract. Both parties agree to the jurisdiction for resolution of disputes under this order as Mecklenburg County, North Carolina. Each party shall be responsible for their own legal fees in any matter related to this agreement.

2. **CREDIT APPROVAL**: If at any time information available on Purchaser's financial condition or credit history, in CITI's judgment, does not justify the terms of payment specified herein, CITI may require full or partial payment in advance, or an acceptable form of payment guarantee such as a bank letter of credit, or other modifications to the terms of payment.

3. **PROPRIETARY INFORMATION**: All information, data, drawings, instruction and operation manuals furnished by CITI with this Contract are proprietary to CITI, submitted in strict confidence, and are to be used by Purchaser solely for the purposes of this Contract, and shall not be reproduced, transmitted, disclosed or used in any other manner without CITI's written authorization.

4. **RISK OF LOSS**: Risk of loss or damage to the Products, or any part thereof, shall pass to Purchaser at the f.o.b. ship point stated herein.

5. **EXCUSABLE DELAY**: CITI shall not be liable for failure to perform or for delay in performance due to fire, flood, or any other act of God; strike or other labor difficulty, including the bankruptcy of any suppliers to CITI, act of any civil or military authority or of Purchaser; riot; embargo; delay in or shortage of transportation facilities; or any other delay beyond CITI's reasonable control. In the event CITI's performance is delayed by any such cause, CITI's schedule for performance shall be extended accordingly. If Purchaser's actions delay CITI's performance, Purchaser shall pay CITI any additional costs incurred by CITI resulting from such delay. If Purchaser delays shipment of Products, or any part thereof, in addition to paying CITI for additional costs incurred, Purchaser shall also pay for the Products or the parts on the date CITI is prepared to make shipment.

6. **TAXES AND LICENSES**: The Purchase Price does not include any licenses or State or local taxes of any kind applicable to the sale, use or delivery of the Products or services covered under this Contract. Purchaser shall pay direct or reimburse CITI for any such license fees or taxes that CITI or CITI's subcontractors or suppliers are required to pay. CITI will apply taxes to all invoices for labor and materials as applicable to the State where the work is sold. If a tax exemption is being claimed, all relevant exemption forms must be provided to CITI at the time of execution of this Contract.

7. **INSPECTION BY PURCHASER**: Purchaser may inspect the Products at Purchaser's expense at the point of manufacture, provided that such inspection is arranged and conducted so as not to unreasonably interfere with CITI's or the manufacturer's operations. Purchaser's inspection of the Products and release for shipment shall constitute Purchaser's acceptance of the Products as conforming to the requirements of this Contract.

8. **WARRANTY**: CITI warrants the Products from defects in material and workmanship for a period of one (1) year from date the Products are initially placed in operation, or eighteen (18) months from date the Products are shipped, whichever occurs first, provided that the Products are stored, installed, maintained and operated in accordance to the manufacturers recommendations and are protected from harm or damage including but not limited to fire, water, physical damage, exposure to inclement weather, extreme temperatures, and not subjected to misuse, neglect or accident. Upon prompt written notice of and determination that such defect is covered under the foregoing warranty, CITI's responsibility is limited to correction of the defect by, at CITI's option, repair or replacement of the defective part or parts, f.o.b. factory. CITI will not accept responsibility for incidental or consequential damages. Unless stated elsewhere herein, CITI provides no warranty of product performance or process results. The foregoing warranties are exclusive and in lieu of all other warranties of any kind, including any implied warranty of merchantability or fitness for a particular purpose.

Any products repaired or replaced under this warranty will be warranted for the remainder of the original warranty period. CITI shall have no responsibility for the condition of primed or finish painted surfaces after the Products leave their point of manufacture.

Field touch-up of shop primed or painted surfaces is normal and shall be at Purchaser's expense. Any touch-up or repainting required to shop primed or painted surfaces, for reasons other than improper or incorrect application in the shop, shall be Purchaser's responsibility.

Purchaser shall be responsible for unpacking and inspecting all shipped Products and noting any damage on the shipper's bill of lading. Any damage must be reported to CITI within 48 hours of receipt of shipment by Purchaser.

9. **PAYMENT TERMS.** CITI's payment terms are Net 30 days from date of CITI invoice. If Purchaser is late in paying the Purchase Price or any partial payment due under this Contract, or otherwise breaches this Contract, CITI shall be entitled to interest at 1½% per month on the overdue amount, and on its damages, calculated from the date of default in payment or other breach, plus court costs, reasonable attorneys' fees and other expenses incurred in any effort to collect.

No retainage on the equipment, products, services, or any part thereof, is allowed unless prior approved by CITI. Full retainage release must be made within the earlier of: seven days after purchaser receives payment of retainage, 60 days from the completion of CITI's scope of work, or 180 days after delivery, whichever occurs first.

10. **BACKCHARGES**: CITI shall not be liable for any charges incurred by Purchaser for work, repairs, replacements or alterations to the Products, without CITI's prior written authorization, and any adverse consequences resulting from such unauthorized work shall be Purchaser's full responsibility.

11. **LIMITATION OF LIABILITY:** CITI shall not be liable to purchaser for any special, indirect, incidental or consequential damages arising from CITI's obligations under this contract, whether such damages are based upon breach of contract, breach of warranty, tort, strict liability or otherwise. In any event, CITI's liability to purchaser shall not exceed the purchase price of the products or parts of the products on which such liability is based.

12. **CANCELLATION BY PURCHASER**: If Purchaser cancels this Contract or refuses to accept delivery of the Products, Purchaser shall be liable to CITI for reasonable cancellation charges, including loss of anticipated profits, administrative costs, commissions to sales representatives, costs incurred by CITI for all work performed or in process up to the time of cancellation or refusal to accept delivery, cancellation charges from CITI's suppliers or subcontractors, and any other expenses incurred by CITI in connection with Purchaser's cancellation or refusal to accept delivery.

13. **DEFAULT BY PURCHASER**: Without incurring any liability or waiving any claim for damages CITI may have against Purchaser, CITI may refuse to make or delay making delivery, and/or withhold any service, and/or ship C.O.D., and/or apply payments to open balances at CITI discretion, if:

(a) Purchaser breaches this or any contract with CITI, or; (b) CITI fails to receive payment within 30 days from date of invoice, or; (c) CITI becomes aware of facts which, in its judgment, render Purchaser's financial condition unsatisfactory or cast doubt on Purchaser's willingness or ability to pay for the Products and/or services, or; (d) Purchaser engages in or consents to liquidation, commission of any act of insolvency, appointment of a receiver of assets or assignment for the benefit of creditors, or if Purchaser becomes the subject of any bankruptcy or insolvency proceeding.

ORD.

CAPITAL PROJECT ORDINANCE

Water Projects

BE IT ORDAINED by the City Council of the City of Concord, North Carolina that pursuant to Section 13.2 Chapter 159 of the General Statutes of North Carolina, the following project ordinance is hereby ordained:

SECTION 1. The project authorized and amended is SCADA.

SECTION 2. The City Manager is hereby authorized to proceed with the implementation and amendments of the projects within the terms of the plans and specifications for the projects.

SECTION 3. The following revenues/expenditures are anticipated to be available to the City of Concord for the project:

Account	Title	Current Budget	Amended Budget	(Decrease) Increase
8700-5811355	SCADA	0	800,000	800,000
8700-5811082	Future Projects	7,701,923	6,901,923	(800,000)

SECTION 4. Accounting records are to be maintained by the Finance Department of the City of Concord in such manner as (1) to provide all information required by the grant agreement and other agreements executed or to be executed with the various parties involved with the project; and (2) to comply with the Local Government Budget and Fiscal Control Act of the State of North Carolina.

SECTION 5. Within five (5) days after adopted, copies of this grant project amendment shall be filed with the City Manager, Finance Director, and City Clerk for direction in carrying out this project.

SECTION 6. The Finance Director is directed to report on the financial status of this project in accordance with the existing City policy. She shall also report to the City Manager any unusual occurrences.

Duly adopted by the City Council of the City of Concord, North Carolina this 10th day of April, 2025.

CITY COUNCIL
CITY OF CONCORD
NORTH CAROLINA

_____
William C. Dusch, Mayor

ATTEST: _____ _____
Kim Deason, City Clerk VaLerie Kolczynski, City Attorney

Bid Tabulation Sheet Summary
J.E. "Jim" Ramseur Park 2022-080
Bids Received March 20th, 2025 at 2:00 PM in Conf Rm C

	1	2	3	4
CONTRACTOR:	**J.D. Goodrum Company**	**Ike's Construction, Inc.**	**Eagle Wood, Inc.**	**Wharton-Smith, Inc.**
ADDRESS:	18339-F Old Statesville Rd Cornelius, NC 28031	303 Executive Park Drive Concord, NC 28025	PO Box 1046 Denver, NC 28037	5601 Seventy-Seven Center Drive Suite 120 Charlotte, NC 28217
LICENSE #:	19284	8037	12347	38755

Item No.	Sect. No.	Description	Estimated Quantity	Unit	Unit Cost	Total Cost	Unit Cost	Total Cost	Unit Cost	Total Cost	Unit Cost	Total Cost
Part A - Total Lump Sum Items Cost												
x	x	Part A Total Cost	1	LS	$ 8,648,068.44	$ 8,648,068.44	$ 7,400,000.00	$ 7,400,000.00	$ 7,610,526.00	$ 7,610,526.00	$ 10,600,317.00	$ 10,600,317.00
Part B - Site Work												
1	800	Mobilization	1	LS	$ 122,943.77	$ 122,943.77	$ 1,075,330.00	$ 1,075,330.00	$ 666,500.00	$ 666,500.00	$ 140,380.00	$ 140,380.00
2	SP	Comprehensive Grading	1	LS	$ 2,051,256.54	$ 2,051,256.54	$ 1,736,818.00	$ 1,736,818.00	$ 2,207,600.00	$ 2,207,600.00	$ 1,639,094.00	$ 1,639,094.00
3	801	Construction Surveying, incl. final as-builts of underground detention and site utilities	1	LS	$ 89,082.00	$ 89,082.00	$ 108,900.00	$ 108,900.00	$ 154,500.00	$ 154,500.00	$ 103,980.00	$ 103,980.00
4	1607	Gravel Construction Entrance	3	EA	$ 3,711.75	$ 11,135.25	$ 6,964.00	$ 20,892.00	$ 6,400.00	$ 19,200.00	$ 4,000.00	$ 12,000.00
5	1605	Temporary Silt Fence	4500	LF	$ 2.07	$ 9,315.00	$ 3.00	$ 13,500.00	$ 2.85	$ 12,825.00	$ 1.62	$ 7,290.00
6	866	Temporary Construction Chain Link Perimeter Fencing w/ Gates	3000	LF	$ 9.54	$ 28,620.00	$ 20.60	$ 61,800.00	$ 15.20	$ 45,600.00	$ 19.27	$ 57,810.00
7	SP, C800	Silt Fence Outlet/Stone Opening	20	EA	$ 185.59	$ 3,711.80	$ 165.00	$ 3,300.00	$ 250.00	$ 5,000.00	$ 300.00	$ 6,000.00
8	SP, C800	Reinforced Silt Fence	3500	LF	$ 2.23	$ 7,805.00	$ 3.20	$ 11,200.00	$ 3.20	$ 11,200.00	$ 2.77	$ 9,695.00
9	SP, C800	Tree Protection Fencing	8500	LF	$ 1.64	$ 13,940.00	$ 2.00	$ 17,000.00	$ 2.45	$ 20,825.00	$ 2.11	$ 17,935.00
10	C800	Concrete Washouts	3	EA	$ 795.38	$ 2,386.14	$ 1,100.00	$ 3,300.00	$ 1,000.00	$ 3,000.00	$ 750.00	$ 2,250.00
11	SP, C800	Temporary Diversion Berm/Swale	4000	LF	$ 7.42	$ 29,680.00	$ 4.00	$ 16,000.00	$ 5.00	$ 20,000.00	$ 3.35	$ 13,400.00
12	1633, C801	Rock Check Dam or Straw Wattle	250	EA	$ 185.59	$ 46,397.50	$ 165.00	$ 41,250.00	$ 300.00	$ 75,000.00	$ 200.00	$ 50,000.00
13	1660	Seeding and Mulching	25	AC	$ 2,969.40	$ 74,235.00	$ 2,875.00	$ 71,875.00	$ 2,500.00	$ 62,500.00	$ 1,596.00	$ 39,900.00
14	C800	Storm Drain Inlet Protection	75	EA	$ 371.18	$ 27,838.50	$ 165.00	$ 12,375.00	$ 400.00	$ 30,000.00	$ 350.00	$ 26,250.00
15	C312, C801	Temp. Sediment Basin: Incl. Rip Rap Aprons, Skimmer, Skimmer Discharge Pipe, Baffles, Anti-Seep Collar, and all other necessary items	3	EA	$ 24,594.71	$ 73,784.13	$ 34,519.00	$ 103,557.00	$ 51,800.00	$ 155,400.00	$ 35,279.00	$ 105,837.00
16	C834-837	Permanent Underground Detention System, East, incl. all necessary materials and installation	1	LS	$ 1,000,100.09	$ 1,000,100.09	$ 1,195,963.00	$ 1,195,963.00	$ 1,450,200.00	$ 1,450,200.00	$ 2,241,696.00	$ 2,241,696.00
17	C834-837	Permanent Underground Detention System, West, incl. all necessary materials and installation	1	LS	$ 322,027.48	$ 322,027.48	$ 345,468.00	$ 345,468.00	$ 334,800.00	$ 334,800.00	$ 483,379.00	$ 483,379.00
18	SP	Tufftrack Grass Pavers or equiv.	400	SY	$ 133.62	$ 53,448.00	$ 83.00	$ 33,200.00	$ 100.00	$ 40,000.00	$ 50.50	$ 20,200.00
19	SP, C814	Baselok Geocell System or equiv.	1500	SY	$ 28.96	$ 43,440.00	$ 46.00	$ 69,000.00	$ 49.00	$ 73,500.00	$ 16.75	$ 25,125.00
20	520	NCDOT Aggregate Base Course (ABC)	7500	TN	$ 41.54	$ 311,550.00	$ 53.30	$ 399,750.00	$ 53.00	$ 397,500.00	$ 42.00	$ 315,000.00
21	270	Type 4 Geotextile for Soil Stabilization	9000	SY	$ 2.92	$ 26,280.00	$ 2.20	$ 19,800.00	$ 3.00	$ 27,000.00	$ 3.50	$ 31,500.00
22	SP, S-101-BW	Greenway Bridges, 14' Clear Width, incl. timber tie abutments and foundations	2	EA	$ 54,297.60	$ 108,595.20	$ 22,280.00	$ 44,560.00	$ 26,900.00	$ 53,800.00	$ 51,200.00	$ 102,400.00
23	SP, S-101-BW	Greenway Bridges, 10' Clear Width, incl. timber tie abutments and foundations	2	EA	$ 59,812.20	$ 119,624.40	$ 25,107.00	$ 50,214.00	$ 30,400.00	$ 60,800.00	$ 56,400.00	$ 112,800.00
24	SP, S-101-BW	Greenway Boardwalk, 10' Clear Width, incl. foundations	350	LF	$ 1,032.61	$ 361,413.50	$ 596.00	$ 208,600.00	$ 836.00	$ 292,600.00	$ 974.00	$ 340,900.00

25	SP, S-101-BW	Greenway Boardwalk, 6' Additional Width, incl. foundations	43	LF	$ 600.24	$ 25,810.32	$ 439.00	$ 18,877.00	$ 836.00	$ 35,948.00	$ 566.00	$ 24,338.00
26	SP, C813	Concrete Wheelstops	11	EA	$ 132.56	$ 1,458.16	$ 275.00	$ 3,025.00	$ 145.00	$ 1,595.00	$ 150.00	$ 1,650.00
27	1087, C812	Painted Crosswalks Thermoplastic 90 mils	22	EA	$ 1,272.60	$ 27,997.20	$ 110.00	$ 2,420.00	$ 1,395.00	$ 30,690.00	$ 660.00	$ 14,520.00
28	846	1'-6" Curb and Gutter Incl. Sloped Ends and Tapers	7000	LF	$ 20.68	$ 144,760.00	$ 24.20	$ 169,400.00	$ 31.00	$ 217,000.00	$ 25.08	$ 175,560.00
29	SP, 610	Pickleball/Basketball Court Asphalt	450	TN	$ 148.47	$ 66,811.50	$ 159.50	$ 71,775.00	$ 163.00	$ 73,350.00	$ 396.00	$ 178,200.00
30	SP, C817	Basketball/Pickleball Court Acrylics and Striping	2600	SY	$ 19.62	$ 51,012.00	$ 28.50	$ 74,100.00	$ 25.60	$ 66,560.00	$ 27.03	$ 70,278.00
31	610	Asphalt Surface Course, Type S9.5C	3200	TN	$ 131.50	$ 420,800.00	$ 146.50	$ 468,800.00	$ 137.00	$ 438,400.00	$ 90.91	$ 290,912.00
32	848, 1000	4" Concrete Sidewalk, incl. HC Ramps, Bench Pads, Waste Station Pads, Bicycle Racks, 3600 PSI	7500	SY	$ 56.21	$ 421,575.00	$ 78.10	$ 585,750.00	$ 74.70	$ 560,250.00	$ 67.50	$ 506,250.00
33	1000, 710	8" Concrete 4000 PSI, Dumpster Pad	100	SY	$ 95.98	$ 9,598.00	$ 128.70	$ 12,870.00	$ 119.00	$ 11,900.00	$ 103.50	$ 10,350.00
34	848	Detectable Warning Plates	700	SF	$ 38.97	$ 27,279.00	$ 21.00	$ 14,700.00	$ 46.50	$ 32,550.00	$ 68.75	$ 48,125.00
35	1087, 1205	Parking Lot Striping, Thermoplastic Pavement Markings, 4", 90 mils	6500	LF	$ 3.45	$ 22,425.00	$ 2.20	$ 14,300.00	$ 3.80	$ 24,700.00	$ 11.13	$ 72,345.00
36	1087, 1205	Handicap Parking Symbol,Thermoplastic 90 mils	11	EA	$ 477.23	$ 5,249.53	$ 330.00	$ 3,630.00	$ 520.00	$ 5,720.00	Incl.	Incl.
37	1087, 1205	Stop Bars, Thermoplastic Pavement Markings, 24", 120 mils	70	LF	$ 25.98	$ 1,818.60	$ 13.20	$ 924.00	$ 28.50	$ 1,995.00	Incl.	Incl.
38	C812	Accessible Parking/HandicapSignage	11	EA	$ 408.29	$ 4,491.19	$ 385.00	$ 4,235.00	$ 450.00	$ 4,950.00	Incl.	Incl.
39	B101-B502	MSE Retaining Wall, incl. footing, stone, drains, and all other necessary items	3850	SF	$ 31.73	$ 122,160.50	$ 25.30	$ 97,405.00	$ 36.50	$ 140,525.00	$ 25.72	$ 99,022.00
40	SP, B-201	Geogrid for Retaining Wall, Gridlock 370 or Equiv.	2200	SY	$ 2.12	$ 4,664.00	$ 1.75	$ 3,850.00	$ 4.00	$ 8,800.00	Incl.	Incl.
41	A-101-PS	Park Entrance Monument with Signage	1	LS	$ 22,835.04	$ 22,835.04	$ 24,200.00	$ 24,200.00	$ 30,350.00	$ 30,350.00	$ 15,200.00	$ 15,200.00
42	C814	Collapsible Steel Bollard Install, Owner Provided Bollard	10	EA	$ 265.13	$ 2,651.30	$ 605.00	$ 6,050.00	$ 450.00	$ 4,500.00	$ 260.00	$ 2,600.00
43	C814	Permanent Steel Bollard, Contractor Provided Bollard	10	EA	$ 1,272.60	$ 12,726.00	$ 1,362.40	$ 13,624.00	$ 1,600.00	$ 16,000.00	$ 695.00	$ 6,950.00
44	C816	Concrete Stairs Type A	30	SF	$ 127.26	$ 3,817.80	$ 150.00	$ 4,500.00	$ 247.00	$ 7,410.00	$ 225.00	$ 6,750.00
45	C816	Concrete Stairs Type B	275	SF	$ 127.26	$ 34,996.50	$ 148.20	$ 40,755.00	$ 252.00	$ 69,300.00	$ 195.00	$ 53,625.00
46	C816	Concrete Stairs Type C	325	SF	$ 127.26	$ 41,359.50	$ 146.40	$ 47,580.00	$ 235.00	$ 76,375.00	$ 190.00	$ 61,750.00
47	C816	Concrete Stairs Type D	300	SF	$ 127.26	$ 38,178.00	$ 145.00	$ 43,500.00	$ 237.00	$ 71,100.00	$ 198.00	$ 59,400.00
48	WSACC, C400-431	Water and Sewer Site Uitlities, incl. all costs to install all utilities as shown in Project Drawings	1	LS	$ 995,783.25	$ 995,783.25	$ 1,217,370.00	$ 1,217,370.00	$ 1,925,400.00	$ 1,925,400.00	$ 1,711,840.00	$ 1,711,840.00
49	310	12" RCP Storm Pipe (Class IV)	250	LF	$ 95.53	$ 23,882.50	$ 76.60	$ 19,150.00	$ 125.00	$ 31,250.00	$ 95.45	$ 23,862.50
50	310	15" RCP Storm Pipe (Class IV)	1600	LF	$ 69.60	$ 111,360.00	$ 76.60	$ 122,560.00	$ 98.00	$ 156,800.00	$ 69.00	$ 110,400.00
51	310	18" RCP Storm Pipe (Class IV)	1900	LF	$ 91.45	$ 173,755.00	$ 88.20	$ 167,580.00	$ 111.00	$ 210,900.00	$ 85.10	$ 161,690.00
52	310	24" RCP Storm Pipe (Class IV)	150	LF	$ 101.29	$ 15,193.50	$ 126.90	$ 19,035.00	$ 140.00	$ 21,000.00	$ 117.30	$ 17,595.00
53	310	30" RCP Storm Pipe (Class IV)	35	LF	$ 161.78	$ 5,662.30	$ 162.20	$ 5,677.00	$ 188.50	$ 6,597.50	$ 157.54	$ 5,513.90
54	310	36" RCP Storm Pipe (Class IV)	52	LF	$ 199.67	$ 10,382.84	$ 209.00	$ 10,868.00	$ 222.50	$ 11,570.00	$ 202.40	$ 10,524.80
55	310	36" O-Ring RCP Storm Pipe (Class IV)	200	LF	$ 288.15	$ 57,630.00	$ 296.50	$ 59,300.00	$ 327.00	$ 65,400.00	$ 311.65	$ 62,330.00
56	310	42" RCP Storm Pipe (Class IV)	44	LF	$ 358.57	$ 15,777.08	$ 278.50	$ 12,254.00	$ 344.00	$ 15,136.00	Provided by EOD	$ 12,448.00
57	310	15" HDPE Storm Drain	75	LF	$ 61.64	$ 4,623.00	$ 57.00	$ 4,275.00	$ 75.50	$ 5,662.50	Provided by EOD	$ 6,600.00
58	310	18" HDPE Storm Drain	150	LF	$ 69.34	$ 10,401.00	$ 62.00	$ 9,300.00	$ 81.00	$ 12,150.00	Provided by EOD	$ 14,250.00
59	310	36" HDPE Storm Drain	26	LF	$ 71.94	$ 1,870.44	$ 98.00	$ 2,548.00	$ 146.00	$ 3,796.00	Provided by EOD	$ 4,108.00
60	310	42" HDPE Storm Drain	35	LF	$ 77.35	$ 2,707.25	$ 169.00	$ 5,915.00	$ 188.00	$ 6,580.00	Provided by EOD	$ 6,895.00
61	C321	15" RCP Headwall	2	EA	$ 2,142.06	$ 4,284.12	$ 4,760.00	$ 9,520.00	$ 2,000.00	$ 4,000.00	Provided by EOD	$ 5,906.00
62	C321	18" RCP Headwall	1	EA	$ 2,192.51	$ 2,192.51	$ 4,760.00	$ 4,760.00	$ 2,000.00	$ 2,000.00	Provided by EOD	$ 3,183.00
63	C321	36" Pipe Headwall (HW A1 and HW B1)	2	EA	$ 4,314.11	$ 8,628.22	$ 6,455.00	$ 12,910.00	$ 3,990.00	$ 7,980.00	Provided by EOD	$ 11,813.00

64	840	15” Nyoplast Drainage Structure	2	EA	$ 3,485.63	$ 6,971.26	$ 2,922.00	$ 5,844.00	$ 4,450.00	$ 8,900.00	Provided by EOD	$ 4,660.00
65	840	18” Nyoplast Drainage Structure	8	EA	$ 3,500.92	$ 28,007.36	$ 5,061.00	$ 40,488.00	$ 4,600.00	$ 36,800.00	Provided by EOD	$ 20,400.00
66	840	30” Nyoplast Drainage Structure	4	EA	$ 4,206.77	$ 16,827.08	$ 7,150.00	$ 28,600.00	$ 6,850.00	$ 27,400.00	Provided by EOD	$ 21,392.00
67	840	Catch Basin w/ Frame and Grate	34	EA	$ 5,206.79	$ 177,030.86	$ 4,400.00	$ 149,600.00	$ 7,350.00	$ 249,900.00	Provided by EOD	$ 251,296.00
68	840	Curb Inlet w/ Frame, Grate, and Hood	18	EA	$ 5,539.16	$ 99,704.88	$ 8,428.00	$ 151,704.00	$ 8,050.00	$ 144,900.00	Provided by EOD	$ 146,018.00
69	840	Shallow Catch Basin w/ Frame and Grate	5	EA	$ 4,664.52	$ 23,322.60	$ 3,520.00	$ 17,600.00	$ 6,450.00	$ 32,250.00	Provided by EOD	$ 30,498.00
70	840	Shalow Curb Inlet w/ Frame, Grate, and Hood	1	EA	$ 5,264.15	$ 5,264.15	$ 2,933.00	$ 2,933.00	$ 7,400.00	$ 7,400.00	Provided by EOD	$ 7,515.00
71	840	48" Dia. Stormwater Manhole w/ Ring and Cover	3	EA	$ 7,059.75	$ 21,179.25	$ 6,726.00	$ 20,178.00	$ 10,100.00	$ 30,300.00	Provided by EOD	$ 33,541.00
72	840	48" Dia. Shallow Stormwater Manhole w/ Ring and Cover	1	EA	$ 7,777.97	$ 7,777.97	$ 3,991.00	$ 3,991.00	$ 11,150.00	$ 11,150.00	$ 12,737.00	$ 12,737.00
73	840	60" Dia. Stormwater Manhole w/ Ring and Cover	2	EA	$ 9,058.89	$ 18,117.78	$ 9,129.00	$ 18,258.00	$ 10,100.00	$ 20,200.00	$ 11,596.00	$ 23,192.00
74	SP	Rock Removal	100	CY	$ 291.64	$ 29,164.00	$ 150.00	$ 15,000.00	$ 400.00	$ 40,000.00	$ 285.00	$ 28,500.00
Part C - Cox Mill Roadway Improvements												
1	310	15" RC Pipe Culv. Class IV	50	LF	$ 69.60	$ 3,480.00	$ 76.60	$ 3,830.00	$ 98.00	$ 4,900.00	Provided by EOD	$ 3,450.00
2	520	NCDOT Aggregate Base Course	25	TN	$ 41.54	$ 1,038.50	$ 88.00	$ 2,200.00	$ 64.00	$ 1,600.00	Provided by EOD	$ 1,050.00
3	607	Milling Asphalt Pavement, 1.5" Depth	700	SY	$ 8.22	$ 5,754.00	$ 25.30	$ 17,710.00	$ 7.50	$ 5,250.00	Provided by EOD	$ 12,075.00
4	607	Incidental Milling	100	SY	$ 11.40	$ 1,140.00	$ 38.50	$ 3,850.00	$ 7.50	$ 750.00	Provided by EOD	$ 1,500.00
5	610	Asphalt Conc. Base Course, Type B25.0C	200	TN	$ 143.17	$ 28,634.00	$ 187.00	$ 37,400.00	$ 128.00	$ 25,600.00	Provided by EOD	$ 2,012.00
6	610	Asphalt Conc. Intermediate Course, Type I19.0C	200	TN	$ 143.17	$ 28,634.00	$ 187.00	$ 37,400.00	$ 133.00	$ 26,600.00	Provided by EOD	$ 12,583.00
7	610	Asphalt Conc. Surface Course, Type S9.5C	200	TN	$ 132.56	$ 26,512.00	$ 190.30	$ 38,060.00	$ 145.00	$ 29,000.00	Provided by EOD	$ 1,747.00
8	846	2'-6" Concrete Curb and Gutter	200	LF	$ 26.51	$ 5,302.00	$ 81.40	$ 16,280.00	$ 35.00	$ 7,000.00	Provided by EOD	$ 6,960.00
9	848	4" Concrete Sidewalk Incl. Curb Ramps	50	SY	$ 59.65	$ 2,982.50	$ 137.50	$ 6,875.00	$ 94.00	$ 4,700.00	Provided by EOD	$ 8,783.00
10	SP	Detectable Warning Plates	24	SF	$ 75.56	$ 1,813.44	$ 44.00	$ 1,056.00	$ 46.50	$ 1,116.00	Provided by EOD	$ 1,650.00
11	852	5" Monolithic Concrete Islands (Surface Mounted)	20	SY	$ 196.19	$ 3,923.80	$ 385.00	$ 7,700.00	$ 139.00	$ 2,780.00	Provided by EOD	$ 3,067.00
12	876	Geotextile for Drainage	125	SY	$ 2.92	$ 365.00	$ 10.00	$ 1,250.00	$ 6.00	$ 750.00	Provided by EOD	$ 875.00
13	1205	Thermoplastic Pavement Marking Lines (4", 90 MILS)	1400	LF	$ 3.45	$ 4,830.00	$ 2.20	$ 3,080.00	$ 3.80	$ 5,320.00	Provided by EOD	$ 12,418.00
14	1205	Thermoplastic Pavement Marking Lines (8", 90 MILS)	155	LF	$ 7.16	$ 1,109.80	$ 4.40	$ 682.00	$ 7.80	$ 1,209.00	Provided by EOD	Incl.
15	1205	Thermoplastic Pavement Marking Lines (24", 120 MILS)	16	LF	$ 25.98	$ 415.68	$ 14.00	$ 224.00	$ 28.50	$ 456.00	Provided by EOD	Incl.
16	1205	Thermoplastic Pavement Marking Symbol (90 MILS)	3	EA	$ 302.24	$ 906.72	$ 220.00	$ 660.00	$ 330.00	$ 990.00	Provided by EOD	Incl.
17	901	Contractor Furnished, Type E Sign	9.25	SF	$ 50.90	$ 470.83	$ 24.00	$ 222.00	$ 56.00	$ 518.00	Provided by EOD	$ 509.00
18	903	Supports, 3-LB Steel U-Channel	45	LF	$ 36.06	$ 1,622.70	$ 8.00	$ 360.00	$ 39.50	$ 1,777.50	Provided by EOD	$ 743.00
19	904	Sign Erection, Type E Sign	2	EA	$ 185.59	$ 371.18	$ 550.00	$ 1,100.00	$ 200.00	$ 400.00	Provided by EOD	$ 440.00
20	904	Sign Erection, Relocate Type E (Ground Mounted)	1	EA	$ 254.52	$ 254.52	$ 330.00	$ 330.00	$ 280.00	$ 280.00	Provided by EOD	$ 880.00
21	1605	Temporary Silt Fence	300	LF	$ 2.07	$ 621.00	$ 3.00	$ 900.00	$ 2.85	$ 855.00	Provided by EOD	$ 1,260.00
22	1622	Temporary Slope Drains	200	LF	$ 42.42	$ 8,484.00	$ 33.00	$ 6,600.00	$ 50.00	$ 10,000.00	Provided by EOD	$ 6,502.00
23	SP	Safety Fence	75	LF	$ 2.11	$ 158.25	$ 2.50	$ 187.50	$ 2.45	$ 183.75	Provided by EOD	$ 225.00
24	1642	Coir Fiber Wattle	200	LF	$ 9.54	$ 1,908.00	$ 9.90	$ 1,980.00	$ 7.00	$ 1,400.00	Provided by EOD	$ 3,220.00
25	1660	Seeding & Mulching	3	AC	$ 2,969.40	$ 8,908.20	$ 2,365.00	$ 7,095.00	$ 2,500.00	$ 7,500.00	Provided by EOD	$ 8,453.00
26	SP	Concrete Washout Structure	1	EA	$ 795.38	$ 795.38	$ 1,100.00	$ 1,100.00	$ 1,000.00	$ 1,000.00	Provided by EOD	$ 1,460.00
Part B Total Cost					$	**8,330,583.64**	**$9,527,140.00**		**$11,244,740.00**		**$10,351,354.20**	
Part C Total Cost					$	**140,435.50**	**$198,131.50**		**$141,935.25**		**$91,862.00**	
Base Bid Price (Part A Total + Part B Total + Part C Total)					**$17,119,087.58**		**$17,125,271.50**		**$18,997,201.25**		**$21,043,533.20**	
Contingency Allowance (5% of Base Bid Price)					**$855,954.38**		**$856,263.58**		**$949,860.06**		**$1,052,176.66**	
Total Bid Price (Base Bid + Contingency Allowance)					**$17,975,041.95**		**$17,981,535.08**		**$19,947,061.31**		**$22,095,709.86**	
All Addenda Acknowledged (3)					Yes		Yes		Yes		Yes	
Minority Affidavits					Yes		Yes		Yes		Yes	
Bid Security (5%)					Yes		Yes		Yes		Yes	

CERTIFICATION: This is certified to be an accurate tabulation of bids received for the project.

Enrique A. Blat

NORTH CAROLINA PROFESSIONAL SEAL 17577 ENGINEER ENRIQUE ALBERTO BLAT

	*denotes calculation error in submitted bid form that did not affect the overall bid results. Unit prices govern
	*denotes unit cost not provided in submitted Bid Form. This bid is disqualified.

Bid Tabulation Summary of for the Logan Rec. Center Parking Lot Expansion

Bids Received March 27, 2025 at 2:00 PM Conference Room C of the BOC

No.	Item: NCDOT Section or Reference	Description	QTY.	Units.	Piedmont Asphalt Paving Company, Inc. 553 Wenn Rd. Concord, NC 28027 NCGCL 45869		Carolina Siteworks Inc. 300 Wade Dr. China Grove, NC 28023 NCGCL 45224		Mile-McClellan Construction Company, Inc. 7120 Weddington Rd. Suite 128, Concord, NC 28027 NCGCL 63358		Mugo Gravel & Grading, Inc. 2600 Concord Pkwy S. Concord, NC 28027 NCGCL 69262		Ike's Construction, Inc. 303 Executive Park Dr. NE. Concord NC 28025 NCGCL 08037	
					Unit Price ($)	Item Total ($)	Unit Price ($)	Item Total ($)	Unit Price ($)	Item Total ($)	Unit Price ($)	Item Total ($)	Unit Price ($)	Item Total ($)
1	800	Mobilization	1	LS	$15,000.00	$15,000.00	$2,500.00	$2,500.00	$12,628.00	$12,628.00	$42,865.00	$42,865.00	$66,500.00	$66,500.00
2	801	Construction Surveying	1	LS	$5,500.00	$5,500.00	$8,900.00	$8,900.00	$6,433.00	$6,433.00	$10,000.00	$10,000.00	$5,300.00	$5,300.00
3	SP-01	Comprehensive Grading	1	LS	$65,000.00	$65,000.00	$66,969.00	$66,969.00	$96,823.00	$96,823.00	$98,850.00	$98,850.00	$55,500.00	$55,500.00
4	SP-06	Traffic Control	1	LS	$4,000.00	$4,000.00	$2,500.00	$2,500.00	$7,124.00	$7,124.00	$16,800.00	$16,800.00	$1,000.00	$1,000.00
		Erosion Control												
5	1607	Construction Entrance	1	LS	$1,500.00	$1,500.00	$1,100.00	$1,100.00	$6,735.00	$6,735.00	$6,500.00	$6,500.00	$2,000.00	$2,000.00
6	SP-02	Silt Fence Stone Outlet	1	EA	$350.00	$350.00	$400.00	$400.00	$1,122.00	$1,122.00	$800.00	$800.00	$300.00	$300.00
7	1605	Temporary Silt Fence	250	LF	$5.00	$1,250.00	$5.50	$1,375.00	$12.00	$3,000.00	$5.00	$1,250.00	$4.00	$1,000.00
8	1660	Seeding and Mulching	0.17	AC	$1,000.00	$170.00	$8,800.00	$1,496.00	$38,346.00	$6,518.82	$3,200.00	$544.00	$24,000.00	$4,080.00
		Asphalt Paving												
9	SP-03, 650	Asphalt Pavement – 2 inches thick S9.5B	150	TN	$140.00	$21,000.00	$105.00	$15,750.00	$210.00	$31,500.00	$177.00	$26,550.00	$140.00	$21,000.00
10	620	Asphalt Binder	8	TN	$775.00	$6,200.00	$830.00	$6,640.00	$666.00	$5,328.00	$690.00	$5,520.00	$775.00	$6,200.00
11	607	Milling Asphalt Pavement, 0" to 1 1/2" Depth	50	SY	$60.00	$3,000.00	$30.00	$1,500.00	$157.00	$7,850.00	$176.00	$8,800.00	$60.00	$3,000.00
12	520	NCDOT Aggregate Base Course (ABC)	450	TN	$70.00	$31,500.00	$64.00	$28,800.00	$49.00	$22,050.00	$53.75	$24,187.50	$70.00	$31,500.00
13	1205 SP-05	Thermoplastic Pavement Marking Lines, 4", 90 mils, (W) Parking stalls	1	LS	$4,200.00	$4,200.00	$1,370.00	$1,370.00	$842.00	$842.00	$2,909.50	$2,909.50	$1,100.00	$1,100.00
14	1205 SP-05	Thermoplastic Directional Symbols, 120 mils (W)	1	LS	$700.00	$700.00	$1,160.00	$1,160.00	$561.00	$561.00	$1,250.00	$1,250.00	$1,000.00	$1,000.00
15	848	Sidewalk Demolition and Replacement, 4 inches Thick	5	SY	$300.00	$1,500.00	$320.00	$1,600.00	$842.00	$4,210.00	$180.00	$900.00	$200.00	$1,000.00
16	846	Curb And Gutter	320	FT	$50.00	$16,000.00	$46.00	$14,720.00	$34.00	$10,880.00	$32.00	$10,240.00	$45.00	$14,400.00
17	Sheet 10	Concrete Flume	2	EA	$300.00	$600.00	$560.00	$1,120.00	$1,052.00	$2,104.00	$2,500.00	$5,000.00	$500.00	$1,000.00
18	Sheet 11	Concrete Flume	1	EA	$300.00	$300.00	$560.00	$560.00	$1,052.00	$1,052.00	$3,000.00	$3,000.00	$500.00	$500.00
19	SP-04, SH-6,7,and 8	SRW Retaining Wall	1	LS	$45,000.00	$45,000.00	$47,391.00	$47,391.00	$47,642.00	$47,642.00	$54,000.00	$54,000.00	$55,250.00	$55,250.00
		Filterra Bioscape Vault												
20	Sheet 9	12'x6' Filterra Bioscape Vault with all appurtenances as	1	LS	$85,000.00	$85,000.00	$73,406.00	$73,406.00	$103,830.00	$103,830.00	$82,500.00	$82,500.00	$78,050.00	$78,050.00
21	876.02	Rip- Rap Apron	2	LS	$2,000.00	$4,000.00	$1,142.00	$2,284.00	$5,481.00	$10,962.00	$4,150.00	$8,300.00	$500.00	$1,000.00
		STORM DRAIN												
22	300	Foundation Conditioning Material, Minor Structures	20	TN	$70.00	$1,400.00	$0.10	$2.00	$140.00	$2,800.00	$46.00	$920.00	$50.00	$1,000.00

23	300	Foundation Conditioning Fabric	25	SY	$5.00	$125.00	$0.50	$12.50	$84.00	$2,100.00	$3.00	$75.00	$6.00	$150.00
24	AASHTO M170 NCDOT	15-Inch RCP Pipe (Class II)	90	FT	$94.00	$8,460.00	$118.40	$10,656.00	$106.00	$9,540.00	$65.00	$5,850.00	$96.00	$8,640.00
25	840	Concrete Drainage Structures (CB #1)	1	EA	$3,800.00	$3,800.00	$2,500.00	$2,500.00	$6,735.00	$6,735.00	$4,250.00	$4,250.00	$4,400.00	$4,400.00
26	840	Frame with Grate, Std. 840.16	1	EA	$1,060.00	$1,060.00	$1,000.00	$1,000.00	$3,508.00	$3,508.00	$600.00	$600.00	$1,000.00	$1,000.00
27	1060	Landscape Plan, Sht. 13 and 14	1	LS	$19,000.00	$19,000.00	$18,000.00	$18,000.00	$10,523.00	$10,523.00	$28,000.00	$28,000.00	$13,700.00	$13,700.00
								Signage						
28	904.50	Do Enter Sign and Wrong Way Sign	2	EA	$350.00	$700.00	$580.00	$1,160.00	$350.00	$700.00	$1,400.00	$2,800.00	$460.00	$920.00
				Total Cost		$346,315.00		$314,871.50		$425,100.82		$453,261.00		$380,490.00
				10% Contingency		$34,631.50		$31,487.15		$42,510.08		$45,326.10		$38,049.00
				Total Cost + Contingency		$380,946.50		$346,358.65		$467,610.90		$498,587.10		$418,539.00
				Bid Bond		YES		YES		YES		YES		YES
				Addendum 1 Acknowledgment		YES		YES		YES		YES		YES

*denotes calculation error in submitted bid form that did not affect the overall bid results. Unit prices govern.

CERTIFICATION: This is certified to be an accurate tabulation of bids received for the project.

City of Concord, North Carolina

Preliminary Application – Extension of Concord Utilities outside Concord City Limits

(Please type or print in black ink)

1. Name of ~~development~~: Ray Barnes
2. Name and address of owner(s)/~~developer(s)~~: Ray Barnes
   5451 Flowes Store Rd Concord NC 28025
3. Owner(~~s~~)/~~developer~~(s) telephone: 704-918-6483 Fax: ~~———~~
4. Name and address of surveyor/engineer: N/A
5. Surveyor/engineer's telephone: N/A Fax: ~~———~~
6. Name, telephone and fax number, and address of agent (if any): N/A
7. Name and address of person to whom comments should be sent: Ray Barnes
   5451 Flowes Store Rd Concord NC 28025
8. Telephone number of person to whom comments should be sent: 704-918-6483
   ~~Fax:~~ ~~———~~
9. Location of property: 5451 Flowes Store Rd Concord NC 28025
10. Cabarrus County P.I.N.#: ~~———~~
11. Current zoning classification: ?
12. Total acres: .40 Total lots proposed: N/A
13. Brief Description of development: Individual owner
14. Proposed Construction Schedule Feb ~ April 2025
15. Type of Service requested Water Tap

1-28-25
Date

Ray Barnes
Signature of Owner/~~Agent~~

Ray Barnes
Name (printed)

NOTE: *By affixing his or her signature hereto, the owner/developer acknowledges understanding of and agreement to comply with all provisions of the Concord City Code section 62.*

Staff Use Only:

Received by: _____ Date: _____

ArcGIS Web Map

1/29/2025, 2:48:53 PM

System Valve
- Gate
- Hydrant Gate

Hydrant
- City

Pressure Main
- Distribution Main

Parcels

Concord City Limits

1:2,015

0 112.5 225 450 ft

0 30 60 120 m

GIS Utility Exhibit Map/Correspondence Information

Date: Wednesday, January 29, 2025

Property Owner/Applicant:
Ray D. Barnes & Amy B. Barnes
5451 Flowes Store Rd., Concord NC 28025

Site Development Description & Location: Ray D. Barnes & Amy B. Barnes at 5451 Flowes Store Rd., Concord NC 28025 (PIN55386278440000) The 0.41-acre parcel located within Cabarrus County jurisdiction is zoned LDR and within Area B of the Cabarrus County and City of Concord interlocal agreement Regarding the Central Area Plan.

Area Water and Sewer Utility Description: Public water is available within Flowes Store Road right of way. The parcel is not considered served by public sewer.

The property owner/developer shall be responsible for any required system modifications and/or extensions to ensure service to the proposed site development. In accordance with Chapter 62 of the Code of the City of Concord, it is the sole responsibility of the owner or the developer to extend water and sewer infrastructure from existing service points and secure any right(s)-of-way/easements as may be necessary to meet site development needs unless the needed utility extension has been identified and approved in the City's capital improvement plan.

Any upgrades to the existing infrastructure that are required to provide adequate service to the property are the financial responsibility of the owner or developer. In addition, it is the responsibility of the owner or developer to confirm all information regarding physical locations, sizes, and materials of pipes; and confirm that the water flow and pressure and sewer capacities of the existing (or any proposed) infrastructure are adequate to meet the required usage and fire protection demands in accordance with federal, state, and local codes and ordinances.

THIS IS NOT A CONTRACT, NOR IS IT AN OFFER TO CONTRACT. THIS IS NOT CONSIDERED VESTING FOR SEWER FLOW ALLOCATION APPROVAL, NOR IS CONSIDERED AN OFFER OF SEWER FLOW ALLOCATION APPROVAL BY THE CITY.
Please note that the actual horizontal and vertical locations of the water and sewer mains with the associated appurtenances should be verified by survey.
In accordance with Chapter 62 of the Code of the City of Concord, it is the sole responsibility of the owner or the developer to extend water and sewer infrastructure from existing service points and secure any right(s)-of-way as may be necessary to meet project needs unless the needed utility extension has been identified and approved in the City's capital improvement plan.
The City makes no warranty of merchant ability or fitness for any purpose, express or implied, and assumes no legal responsibility for the information contained herein.

City of Concord, North Carolina

Preliminary Application – Extension of Concord Utilities outside Concord City Limits

(Please type or print in black ink)

1. Name of development: Flowes Point
2. Name and address of owner(s)/developer(s): Paul Goforth
   4250 Abbeydale Dr Midland, NC 28107
3. Owner(s)/developer(s) telephone: 704-352-6008 Fax: N/A
4. Name and address of surveyor/engineer: Jamie Davis
   4702 Bothwell Dr Marshville, NC 28103
5. Surveyor/engineer's telephone: 704-291-6801 Fax: N/A
6. Name, telephone and fax number, and address of agent (if any): N/A
7. Name and address of person to whom comments should be sent: Paul Goforth
   paul@summitbg.net 4250 Abbeydale Dr Midland, NC 28107
8. Telephone number of person to whom comments should be sent: 704-352-6008
   Fax: N/A
9. Location of property: 6272 Flowes Store RD Concord, NC 28025
10. Cabarrus County P.I.N.#: 55374846600000
11. Current zoning classification:
12. Total acres: 4.24 Total lots proposed: 2 lots
13. Brief Description of development: Subdividing to create 2 lots
14. Proposed Construction Schedule Ready to start after permits are issued.
15. Type of Service requested Water tap & service for two Residential Homes

03-05-2025
Date

Paul Goforth
Signature of Owner/Agent

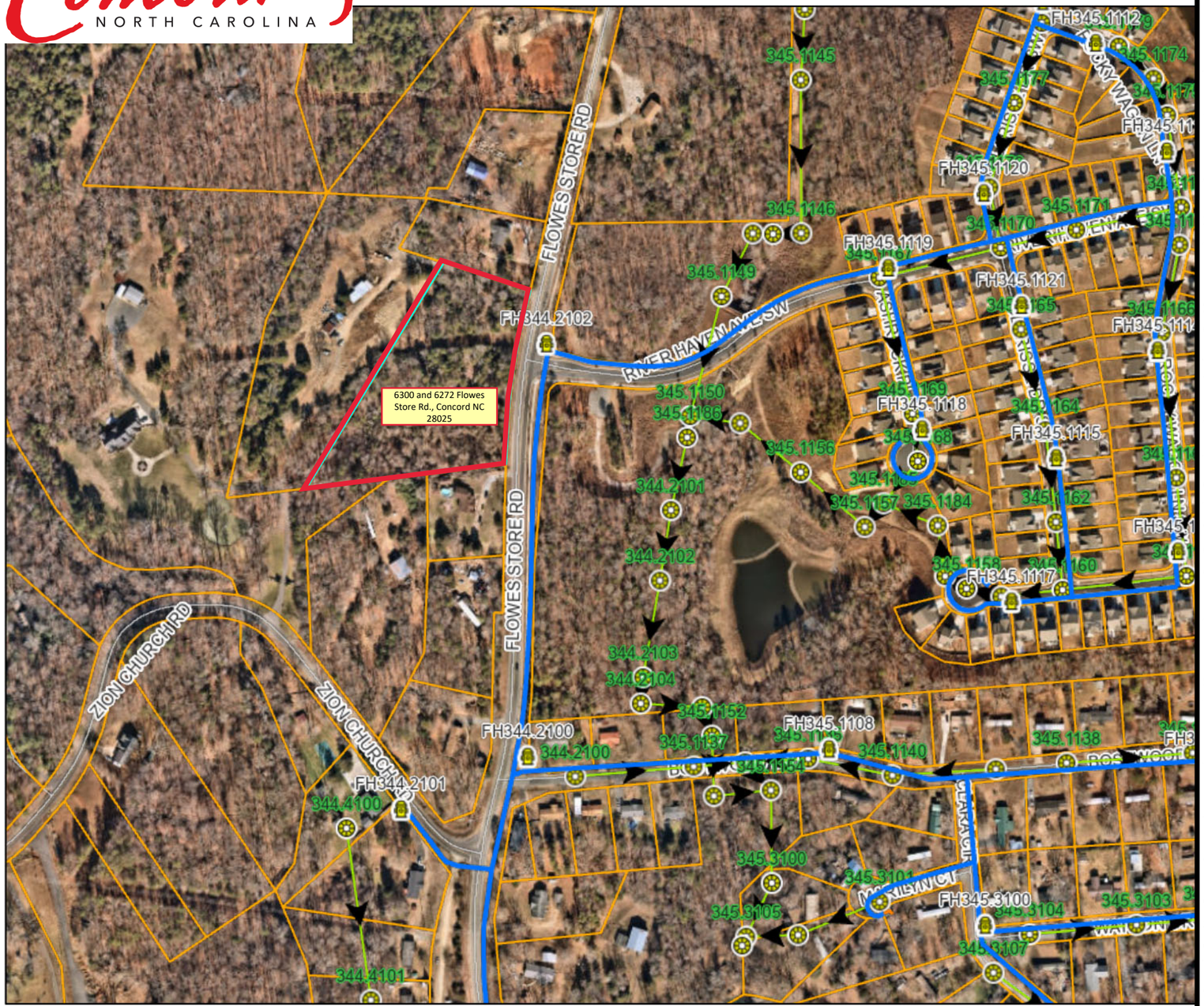
Paul Goforth
Name (printed)

NOTE: *By affixing his or her signature hereto, the owner/developer acknowledges understanding of and agreement to comply with all provisions of the Concord City Code section 62.*

Staff Use Only:

Received by: _____ Date: _____

ArcGIS Web Map



3/10/2025, 1:47:08 PM

Hydrant
City
Pressure Main
Blow Off
Distribution Main
Sewer Manhole
Sewer Gravity Main
Parcels New
Centerline

1:4,242

0	237.5	475	950 ft
0	70	140	280 m

GIS Utility Exhibit Map/Correspondence Information

Date: March 11, 2025

Property Owner/Applicant
James Morris
Flowes Store, LLC
3225 McLeod Dr., Suite 100
Las Vegas, NV, 89121-2257

Applicant/Agent
Paul Goforth
Summit Building Group, LL
4250 Abbeydale Dr., Midland, NC 28107

Site Development Description & Location: Paul Goforth at 6300 and 6272 Flowes Store Rd., Concord NC 28025 (PIN55374846600000) The 3.85-acre parcel located within Cabarrus County jurisdiction is zoned LDR and within Area B of the Cabarrus County and City of Concord interlocal agreement Regarding the Central Area Plan.

Area Water and Sewer Utility Description: Public water is available within Flowes Store Road. Public sewer is not considered available.
The property owner/developer shall be responsible for any required system modifications and/or extensions to ensure service to the proposed site development. In accordance with Chapter 62 of the Code of the City of Concord, it is the sole responsibility of the owner or the developer to extend water and sewer infrastructure from existing service points and secure any right(s)-of-way/ easements as may be necessary to meet site development needs unless the needed utility extension has been identified and approved in the City's capital improvement plan.

Any upgrades to the existing infrastructure that are required to provide adequate service to the property are the financial responsibility of the owner or developer. In addition, it is the responsibility of the owner or developer to confirm all information regarding physical locations, sizes, and materials of pipes; and confirm that the water flow and pressure and sewer capacities of the existing (or any proposed) infrastructure are adequate to meet the required usage and fire protection demands in accordance with federal, state, and local codes and ordinances.

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The City makes no warranty of merchant ability or fitness for any purpose, express or implied, and assumes no legal responsibility for the information contained herein.

CONCORD CITY COUNCIL
BOARD AND COMMISSION APPOINTMENTS (All are 3 year terms with the exception of the Fireman's Relief Fund and the CDDC Board of Directors)

TERM EXPIRES

Alcoholic Beverage Control Board
(3 members all appointed by City) (NO LIMIT ON TERMS)

1. Scott Padgett — 6/30/26
2. Alan Benson (appt. 11/10/21) term amended 3/14/24 — 6/30/25
3. Brian Hiatt — 6/30/27

Fireman's Relief Fund – (no term limit)

1. Jennifer Parsley
2. Terry Crawford

Concord/Kannapolis Transit Commission
(two Council Members appointed by City of Concord)

1. Betty Stocks — 12/31/26
2. John Sweat — 12/31/26

Cabarrus-Rowan Urban Area Metropolitan Planning Organization (CRMPO); TAC and TCC
(One-year terms)

TAC – (2 Council Members appointed)

1. JC McKenzie — 12/31/25
2. Terry Crawford – alternate — 12/31/25

TCC – (2 City staff members appointed)

1. Phillip Graham — 12/31/25
2. Tony Tagliaferri – alternate — 12/31/25

Centralina Regional Council (one-year terms)

1. Lori Clay — 12/31/25
2. Andy Langford – alternate — 12/31/25

Planning & Zoning Commission
(7 members – 6 appointed by City and 1 by County (ETJ); 2 alternates – appointed by City)
(MEMBERS CANNOT SERVE MORE THAN 2 CONSECUTIVE 3-YEAR TERMS)

1. John Howard (reappointed to 2nd term 6/9/22) — 6/30/25
2. Maya Jones (reappointed to 2nd term 6/9/22) — 6/30/25
3. Jim Hays — 6/30/25
4. DeAnne Haney — 6/30/25
5. Phil Jones (reappt'd to 2nd term 6/13/24) — 6/30/27
6. Brittany Evans (reappt'd to 2nd term 6/13/24) — 6/30/27
7. ETJ (County appointment)

Alternates:
1. Cesar Correa — 6/30/26
2. J King (appt'd 6/13/24) — 6/30/27

Board of Adjustment
(7 members – 6 appointed by City and 1 by County (ETJ); 2 alternates – appointed by City)
(MEMBERS CANNOT SERVE MORE THAN 2 CONSECUTIVE 3-YEAR TERMS)

1.	Steve Tice (reappointed to 2nd term 6/9/22)	6/30/25
2.	David Niekamp (reappointed to 2nd term 6/9/22)	6/30/25
3.	Vamsi Pola	6/30/25
4.	Cynthia Hayes	6/30/26
5.	Chuck Collier (reapptd. to 2nd term 6/8/23)	6/30/26
6.	Coretta Grant (reapptd. to 2nd term 6/8/23)	6/30/26
7.	ETJ member	
Alternates:	1. Antwion Riley	6/30/26
	2. VACANT	

Historic Preservation Commission **(members do NOT have to reside in Historic District) (7 members and 2 alternates all appointed by City)**
(MEMBERS CANNOT SERVE MORE THAN 2 CONSECUTIVE 3-YEAR TERMS)

1.	John Eury	6/30/26
2.	Steve Bradley	6/30/26
3.	Randy Hopkins	6/30/26
4.	Meredith Barbee (reappt'd to 2nd term 6/13/24)	6/30/27
5.	Mary Margaret Underwood (reappt'd to 2nd term 6/13/24)	6/30/27
6.	James Firth (reappt'd to 2nd term 6/13/24)	6/30/27
7.	Sydney Yih (appt'd 6/13/24)	6/30/27
Alternates:	1. Eric Williamson (appt'd 6/13/24)	6/30/27
	2. Jason Goldstein (appt'd 6/13/24)	6/30/27

Library Board of Trustees
(County Board – City appoints 1 member and confirms 1 County appointment) (MEMBERS CANNOT SERVE MORE THAN 2 CONSECUTIVE TERMS)

City Appointment: Amy Burns (appt'd 6/9/22) 6/30/25
Confirmed County Appointment: Kathy Dums (appt'd 12/16/24) 9/30/27

WSACC

Council Appt'd:	Jennifer Parsley-Hubbard	6/30/26
City Member:	Jeff Corley	6/30/25

Stormwater Management Advisory Committee
Group 1 - (2 members with engineering or scientific training, vocational experience, or strong personal interest in environmental mgmt. or preservation)
Group 2 - (2 members from recognized neighborhood associations)
Group 3 - (2 members from business or non-profit organizations)
At-Large Members (3)
(MEMBERS CANNOT SERVE MORE THAN 2 CONSECUTIVE TERMS)

Group 1		
1.	Barry Hawkins (reapptd. to 2nd term 6/8/23)	6/30/26
2.	Carie Irving (apptd 6/9/22)	6/30/25
Group 2		
3.	Jonathan Gruber (reappt'd to 2nd term 6/13/24)	6/30/27
4.	Don Seitz (appt'd 6/13/24)	6/30/27

Group 3

5.	Emily Burkhart (reappt'd to 2nd term 6/13/24)	6/30/27
6.	Emily Dollberg (appt'd 6/13/24)	6/30/27

At large members

7.	Kristin Roland (reappt'd to 2nd term 6/13/24)	6/30/27
8.	Jack Lambert (appt'd 6/13/24)	6/30/27

At the June 8, 2017 City Council mtg, the Council voted to adopt Ord. #17-46 to amend the Chapter 60 of the City Code. The amendment reduced the number of members in each group from three (3) members to two (2) members and the remaining three (3) members were appointed as Members At Large.

CDDC Board of Directors – (one-year term)

City Member:	Josh Smith	6/30/25

Public Art Commission

* At the November 13, 2014 City Council meeting, the Council voted to establish a permanent 10 member Public Art Advisory Committee to facilitate delegated City funded art projects, identify potential project areas within Center City, and to make recommendations on potential (if any) zoning / development regulations as it relates to public art and encourage privately funded "public" art projects.

** At the March 11, 2021 City Council meeting, the Council voted to include a staff member from the City's Parks and Recreation Department and also to include 3 at-large members.

*** At the February 9, 2023 City Council meeting, the Council voted to re-organize the Public Art Advisory Committee to be a citizen-based Public Art Commission.

The Commission shall consist of not more than 15 members to include 11 voting members appointed by the City Council, and up to four nonvoting members of City staff appointed by the City Manager. In order to create a rotating membership, Council shall appoint three (3) commissioners with an initial term of one (1) year; (3) commissioners with an initial term of two (2) years and four (4) commissioners with an initial term of three (3) years.

1.	Barbara Propst (District 1) (appt'd to 3-yr term 6/13/24)	6/30/27
2.	Jeff Faggart (District 2)	6/30/25
3.	Doyle Bussey (District 3)	6/30/26
4.	Michael Askin (District 4) (appt'd to 3-yr term 6/13/24)	6/30/27
5.	Deepa Prabhakar (District 5)	6/30/25
6.	Danielle Player (District 6)	6/30/26
7.	Vacant (District 7)	

At large members

1.	Bodunrin Ladele (appt'd 6/13/24)	6/30/27
2.	Jonathan Ewart	6/30/26
3.	Carter Thomas	6/30/26

Ex Officio Members (City staff)

1. Taylor Morris (Parks and Recreation)

2. Kaylee Caton (Planning & Neighborhood Dev. Services)
3. Susan Sessler (Buildings and Grounds)

Standing Member (Cabarrus Arts Council Executive Director or designee)
Liz Fitzgerald

Commission Liaison
Sarah Gay, ClearWater Arts Coordinator

Concord United Committee
At the February 11, 2021 City Council meeting, the Council approved the establishment of the Concord United Committee.

In order to stagger the terms of office, one-third of initial appointments will be for 1 year, one-third of initial appointments will be for 2 years, and the one-third of initial appointments will be for 3 years.

Members shall have three-year appointments following initial appointments.

*Bob Anderson	4/30/25 – Co-Chair
*Bertram Hinton, Jr.	4/30/25 – Co-Chair
*Lamarie Austin-Stripling	4/30/25 – Co-Chair

*Aimy Steele	4/30/25
*Cecilia Perz (filling unexp. tm. Of Caroline Overcash)	4/30/25
*Greg Mills	4/30/25
*Quinton Locklear	4/30/25
William Porter (appt'd 9/12/24 – filling Bob Anderson's tm)	4/30/25

**Amos McClorey	4/30/26
**Kay Tembo	4/30/26
**Cindy Hanson	4/30/26
**Douglas Carroll	4/30/26
**Gracie Galloway	4/30/26
**Ingrid Nurse	4/30/26
**Jaymond Bryant-Herron	4/30/26
**Ann Fleming	4/30/26

***Wendy McConnell (filling unexp. tm of Jennifer Terris)	4/30/27
***Michelle Joshua (filling unexp. tm. of Joe DeJesus)	4/30/27
***Uda Kumar (first 3-yr term)	4/30/27
***Rayshion Sashington	4/30/27
***Sandra Torres	4/30/27
***Theresa Scott-Stills	4/30/27
Laura Aguilar (appt'd 9/12/24-fillign unexp. tm. of Lyndia G)	4/30/27
VACANT	4/30/27

*Reappointed to first 3-year term at the April 14, 2022 Council Meeting
**Reappointed to first 3-year term at the May 11, 2023 Council Meeting
***Reappointed to second 3-year term at the 4/23/24 2nd Work Session, with exception of Uda Kumar

12/16/24

AN ORDINANCE TO TEMPORARILY CLOSE CERTAIN STATE-MAINTAINED ROADS FOR A SPECIAL EVENT ORGANIZED BY THE CITY OF CONCORD, NC

WHEREAS, North Carolina General Statute 20-169 authorizes local authorities to regulate by ordinance the use of a highway within their jurisdiction by processions, assemblages or anything that may be construed as a procession or assemblage, and

WHEREAS, the City of Concord will consult with the local NCDOT Division office to verify that a proposed event will not 1) interfere with other planned special events and 2) impact or be impacted by planned maintenance or other activities., and

WHEREAS, the City of Concord will hold the Art Walk on Union, Streetscape Grand Opening Block Party, Candy Crawl, the Tree Lighting Ceremony and the Concord Christmas Parade

WHEREAS, these events will require the temporary closing of Cabarrus Ave (SR 1002).

NOW, THEREFORE, BE IT ORDAINED by the Council of the City of Concord, North Carolina, that Cabarrus Ave (SR 1002) be closed to vehicular traffic on:

April 12 and September 6, 2025 from the hours of
7 a.m. to 6 p.m for Art Walk events

May 3, 2025 from the hours of
8 a.m. to 9 p.m. for the Streetscape Grand Opening Block Party

October 31, 2025 from the hours of
1 p.m. to 6 p.m. for the Candy Crawl

November 21, 2025 from the hours of
1 p.m. to 11 p.m. for the Tree Lighting Ceremony

November 22, 2025 from the hours of
12 p.m. to 8 p.m. for the Concord Christmas Parade

The city will place signage as appropriate advising the Public of the closing.

A copy of this Ordinance shall be forwarded to the local NCDOT Division Office.
Adopted this 10th day of April 2025.

ATTEST:

APPROVED AS TO FORM:

RESOLUTION
ADOPTING THE CABARRUS STANLY UNION
REGIONAL HAZARD MITIGATION PLAN

WHEREAS, the citizens and property within Concord are subject to the effects of natural hazards that pose threats to lives and cause damage to property, and with the knowledge and experience those certain areas of the county are particularly vulnerable to drought, extreme heat, hailstorm, hurricane and tropical storm, lightning, thunderstorm wind/high wind, tornado, winter storm and freeze, flood, hazardous material incident, and wildfire; and

WHEREAS, Concord desires to seek ways to mitigate the impact of identified hazard risks; and

WHEREAS, the Legislature of the State of North Carolina has in Article 5, Section 160D-501 of Chapter 160D of the North Carolina General Statutes, delegated to local governmental units the responsibility to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry; and

WHEREAS, the Legislature of the State of North Carolina has enacted General Statute Section 166A-19.41 (*State emergency assistance funds*) which provides that for a state of emergency declared pursuant to G.S. 166A-19.20(a) after the deadline established by the Federal Emergency Management Agency pursuant to the Disaster Mitigation Act of 2002, P.L. 106-390, the eligible entity shall have a hazard mitigation plan approved pursuant to the Stafford Act; and.

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 states that local governments must develop an All-Hazards Mitigation Plan in order to be eligible to receive future Hazard Mitigation Grant Program Funds and other disaster-related assistance funding and that said Plan must be updated and adopted within a five-year cycle; and

WHEREAS, the Concord has performed a comprehensive review and evaluation of each section of the previously approved Hazard Mitigation Plan and has updated the said plan as required under regulations at 44 CFR Part 201 and according to guidance issued by the Federal Emergency Management Agency and the North Carolina Division of Emergency Management.

WHEREAS, it is the intent of the Concord City Council to fulfill this obligation in order that the City will be eligible for federal and state assistance in the event that a state of disaster is declared for a hazard event affecting the City;

NOW, THEREFORE, be it resolved that the Concord City Council hereby:

1. Adopts the Cabarrus Stanly Union Regional Hazard Mitigation Plan.

2. Vests Concord Division of Emergency Management with the responsibility, authority, and the means to:

(a) Inform all concerned parties of this action.

(b) Cooperate with Federal, State and local agencies and private firms which undertake to study, survey, map and identify floodplain areas, and cooperate with neighboring communities with respect to management of adjoining floodplain areas in order to prevent exacerbation of existing hazard impacts.

3. Appoints Concord Division of Emergency Management to assure that the Hazard Mitigation Plan is reviewed annually and every five years as specified in the Plan to assure that the Plan is in compliance with all State and Federal regulations and that any needed revisions or amendments to the Plan are developed and presented to the Concord City Council for consideration.

4. Agrees to take such other official action as may be reasonably necessary to carry out the objectives of the Hazard Mitigation Plan.

Adopted this the 10th day of April 2025.

CITY COUNCIL
CITY OF CONCORD
NORTH CAROLINA

_____
William C. Dusch, Mayor

Attest:

_____
Kim J. Deason, Clerk

Cabarrus Stanly Union Regional Hazard Mitigation Plan 2025 Update

DRAFT- JANUARY 2025

TABLE OF CONTENTS

SECTION 1
INTRODUCTION

This section of the plan provides a general introduction to the Cabarrus Stanly Union Regional Hazard Mitigation Plan. It consists of the following five subsections:

- 1.1 Background
- 1.2 Purpose
- 1.3 Scope
- 1.4 Authority
- 1.5 Summary of Plan Contents

1.1 BACKGROUND

Natural hazards, such as thunderstorms, winter storms, floods, and tornadoes, are a part of the world around us. Their occurrence is natural and inevitable, and there is little we can do to control their force and intensity. We must consider these hazards to be legitimate and significant threats to human life, safety, and property.

The Cabarrus Stanly Union Region is in the western Piedmont of North Carolina and includes the counties of Cabarrus, Stanly, and Union and the municipal governments within those counties. This area is vulnerable to a wide range of natural hazards, most notably tornadoes and thunderstorms, flooding, and severe winter weather. It is also vulnerable to human-caused hazards, such as hazardous substance releases and cyber-attacks. These hazards threaten the life and safety of residents in the region and have the potential to damage or destroy both public and private property, disrupt the local economy, and impact the overall quality of life of individuals who live, work, and vacation in the region.

While the threat from hazardous events may never be fully eliminated, there is much we can do to lessen their potential impact upon our community and our citizens. By minimizing the impact of hazards upon our built environment, we can prevent such events from resulting in disasters. The concept and practice of reducing risks to people and property from known hazards is referred to as *hazard mitigation*.

FEMA Definition of Hazard Mitigation:
"Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards."

Hazard mitigation techniques include both structural measures (such as strengthening or protecting buildings and infrastructure from the destructive forces of potential hazards) and non-structural measures (such as the adoption of sound land use policies and the creation of public awareness programs). It is widely accepted that the most effective mitigation measures are implemented at the

local government level, where decisions on the regulation and control of development are ultimately made. A comprehensive mitigation approach addresses hazard vulnerabilities that exist today and in the foreseeable future. Therefore, it is essential that projected patterns of future development are evaluated and considered in terms of how that growth will increase or decrease a community's overall hazard vulnerability.

A key component in the formulation of a comprehensive approach to hazard mitigation is to develop, adopt, and update a local hazard mitigation plan as needed. A hazard mitigation plan establishes the broad community vision and guiding principles for reducing hazard risk, and further proposes specific mitigation actions to eliminate or reduce identified vulnerabilities.

The three counties participating in the development of the Cabarrus Stanly Union Regional Hazard Mitigation Plan first joined together in 2014 to develop the initial version of this regional plan. Prior to that, each County was operating under individual County-level hazard mitigation plans. The plan development process for the 2025 update of the plan is detailed in Section 2: Planning Process.

This regional plan draws from each of the County plans to document the region's sustained efforts to incorporate hazard mitigation principles and practices into routine government activities and functions. At its core, the Plan recommends specific actions to minimize hazard vulnerability and protect residents from losses to those hazards that pose the greatest risk. These mitigation actions go beyond simply recommending structural solutions to reduce existing vulnerability, such as elevation, retrofitting, and acquisition projects. Local policies on community growth and development, incentives for natural resource protection, and public awareness and outreach activities are examples of other actions considered to reduce the region's vulnerability to identified hazards. The Plan remains a living document, with implementation and evaluation procedures established to help achieve meaningful objectives and successful outcomes over time.

1.1.1 The Disaster Mitigation Act and the Flood Insurance Reform Acts

In an effort to reduce the Nation's mounting natural disaster losses, the U.S. Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) in order to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Section 322 of DMA 2000 emphasizes the need for state, local and Tribal government entities to closely coordinate on mitigation planning activities and makes the development of a hazard mitigation plan a specific eligibility requirement for any local or Tribal government applying for federal mitigation grant funds. These funds include the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) program, all of which are administered by the Federal Emergency Management Agency (FEMA) under the Department of Homeland Security. Communities with an adopted and federally-approved hazard mitigation plan thereby become pre-positioned and more apt to receive available mitigation funds before and after the next disaster strikes.

The Cabarrus Stanly Union Regional Hazard Mitigation Plan has been prepared in coordination with FEMA Region IV and North Carolina Emergency Management (NCEM) to ensure that the Plan meets all applicable FEMA and state requirements for hazard mitigation plans. A *Local Mitigation Plan Review Tool*, found in Appendix C, provides a summary of federal and state minimum standards and notes the location where each requirement is met within the Plan.

1.2 PURPOSE

The purpose of the Cabarrus Stanly Union Regional Hazard Mitigation Plan is to:

- Completely update the existing Cabarrus Stanly Union Regional Hazard Mitigation Plan to demonstrate progress and reflect current conditions;
- Increase public awareness and education;
- Maintain grant eligibility for participating jurisdictions; and
- Update the plan in accordance with Community Rating System (CRS) requirements; and
- Maintain compliance with state and federal legislative requirements for local hazard mitigation plans.

1.3 SCOPE

The focus of the Cabarrus Stanly Union Regional Hazard Mitigation Plan is on those hazards determined to be "high" or "moderate" risks to the region, as determined through a detailed hazard risk assessment. Other hazards that pose a "low" or "negligible" risk will continue to be evaluated during future updates to the Plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables the participating counties and municipalities to prioritize mitigation actions based on those hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes the counties of Cabarrus, Stanly, and Union, as well as their incorporated jurisdictions. **Table 1.1** indicates the participating jurisdictions.

TABLE 1.1: PARTICIPATING JURISDICTIONS IN THE CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLAN

Cabarrus County	
Concord	Midland
Harrisburg	Mount Pleasant
Kannapolis	
Stanly County	
Albemarle	Norwood
Badin	Oakboro
Locust	Red Cross
Misenheimer	Richfield
New London	Stanfield
Union County	
Fairview	Monroe
Hemby Bridge	Stallings
Indian Trail	Unionville
Lake Park	Waxhaw
Marshville	Weddington
Marvin	Wesley Chapel
Mineral Springs	Wingate

1.4 AUTHORITY

The Cabarrus Stanly Union Regional Hazard Mitigation Plan has been developed in accordance with current state and federal rules and regulations governing local hazard mitigation plans and has been adopted by each participating county and local jurisdiction in accordance with standard local procedures. Copies of the adoption resolutions for each participating jurisdiction are provided in Appendix A.

This plan has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S.C. 5165, enacted under Section 104 of the Disaster Mitigation Act of 2000, (DMA 2000) Public Law 106-390 of October 30, 2000, as implemented at CFR 201.6 and 201.7 dated October 2007.

1.5 SUMMARY OF PLAN CONTENTS

The contents of this Plan are designed and organized to be as reader-friendly and functional as possible. While significant background information is included on the processes used and studies completed (i.e., risk assessment, capability assessment), this information is separated from the more meaningful planning outcomes or actions (i.e., mitigation strategy, mitigation action plan).

Section 2, ***Planning Process***, provides a complete narrative description of the process used to prepare the Plan. This includes the identification of participants on the planning team and describes how the public and other stakeholders were involved. It also includes a detailed summary for each of the key

meetings held, along with any associated outcomes.

The ***Community Profile***, located in Section 3, provides a general overview of the Cabarrus Stanly Union Region, including prevalent geographic, demographic, and economic characteristics. In addition, building characteristics and land use patterns are discussed. This baseline information provides a snapshot of the planning area and helps local officials recognize those social, environmental, and economic factors that ultimately play a role in determining the region's vulnerability to hazards.

The Risk Assessment is presented in three sections: Section 4, ***Hazard Identification***; Section 5, ***Hazard Profiles***; and Section 6, ***Vulnerability Assessment***. Together, these sections serve to identify, analyze, and assess hazards that pose a threat to the Cabarrus Stanly Union Region. The risk assessment also attempts to define any hazard risks that may uniquely or exclusively affect specific areas of the region.

The Risk Assessment begins by identifying hazards that threaten the region. Next, detailed profiles are established for each hazard, building on available historical data from past hazard occurrences, spatial extent, and probability of future occurrence. This section culminates in a hazard risk ranking based on conclusions regarding the frequency of occurrence, spatial extent, and potential impact highlighted in each of the hazard profiles. In the vulnerability assessment, NCEM's Risk Management section's loss estimation methodology is used to evaluate known hazard risks by their relative long-term cost in expected damages. In essence, the information generated through the risk assessment serves a critical function as the participating jurisdictions in the Cabarrus Stanly Union Region seek to determine the most appropriate mitigation actions to pursue and implement—enabling them to prioritize and focus their efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk(s).

The ***Capability Assessment***, found in Section 7, provides a comprehensive examination of the Cabarrus Stanly Union Region's capacity to implement meaningful mitigation strategies and identifies opportunities to increase and enhance that capacity. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability, fiscal capability, and political capability. Information was obtained through the use of a detailed survey questionnaire and an inventory and analysis of existing plans, ordinances, and relevant documents. The purpose of this assessment is to identify any existing gaps, weaknesses, or conflicts in programs or activities that may hinder mitigation efforts and to identify those activities that should be built upon in establishing a successful and sustainable local hazard mitigation program.

The *Community Profile*, *Risk Assessment*, and *Capability Assessment* collectively serve as a basis for determining the goals for the Cabarrus Stanly Union Regional Hazard Mitigation Plan, each contributing to the development, adoption, and implementation of a meaningful and manageable *Mitigation Strategy* that is based on accurate background information.

The ***Mitigation Strategy***, found in Section 8, consists of broad goal statements as well as an analysis of hazard mitigation techniques for the jurisdictions participating in the Cabarrus Stanly Union Regional Hazard Mitigation Plan to consider in reducing hazard vulnerabilities. The strategy provides the foundation for a detailed ***Mitigation Action Plan***, found in Section 9, which links specific mitigation actions for each county and municipal department or agency to locally-assigned implementation mechanisms and target completion dates. Together, these sections are designed to make the Plan both strategic, through the identification of long-term goals, and functional, through the identification of immediate and short-term actions that will guide day-to-day decision-making and project

implementation.

In addition to the identification and prioritization of possible mitigation projects, emphasis is placed on the use of program and policy alternatives to help make the Cabarrus Stanly Union Region less vulnerable to the damaging forces of hazards while improving the economic, social, and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning process, particularly in identifying ways to link, where possible, hazard mitigation policies and programs with complimentary community goals related to disaster recovery, housing, economic development, recreational opportunities, transportation improvements, environmental quality, land development, and public health and safety.

Plan Maintenance, found in Section 10, includes the measures that the jurisdictions participating in the Cabarrus Stanly Union Regional plan will take to ensure the Plan's continuous long-term implementation. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

SECTION 2
PLANNING PROCESS

This section describes the planning process undertaken to develop the 2025 update of the Cabarrus Stanly Union Regional Hazard Mitigation Plan. Each previous version of the plan contains information on the planning process used to develop or update that particular. Copies of the previous (2020) plan can be obtained by contacting each county emergency management office or NCEM's Hazard Mitigation Planning Section.

This section consists of the following nine subsections:

- 2.1 Overview of Hazard Mitigation Planning
- 2.2 History of Hazard Mitigation Planning in the Cabarrus Stanly Union Region
- 2.3 Updating the Plan in 2025
- 2.4 The Cabarrus Stanly Union Regional Hazard Mitigation Planning Committee
- 2.5 Community Meetings and Workshops
- 2.6 Involving the Public
- 2.7 Involving the Stakeholders
- 2.8 Documentation of Plan Progress
- 2.9 Cabarrus County and City of Concord CRS Planning Process Documentation

44 CFR Requirement
44 CFR Part 201.6(c)(1): The plan shall include documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

2.1 OVERVIEW OF HAZARD MITIGATION PLANNING

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks, and then determining how to best minimize or manage those risks. This process informs the development of the hazard mitigation plan, and more specifically, identifies specific mitigation actions to effectively address existing and evolving risks. Each mitigation action is designed to achieve both short-term goals and a long-term vision for the community.

To ensure the functionality of a hazard mitigation plan, responsibility is assigned for each proposed mitigation action to a specific individual, department, or agency along with a schedule or target completion date for its implementation (see Section 10: *Plan Maintenance*). Plan maintenance procedures are established for the routine monitoring of implementation progress, as well as the evaluation and enhancement of the mitigation plan itself. These plan maintenance procedures ensure

that the plan remains a current, dynamic, and effective planning document over time that becomes integrated into the routine local decision-making process.

Communities that participate in hazard mitigation planning have the potential to accomplish many benefits, including:

- Saving lives and property,
- Saving money,
- Speeding recovery following disasters,
- Reducing future vulnerability through wise development and post-disaster recovery and reconstruction,
- Expediting the receipt of pre-disaster and post-disaster grant funding, and
- Demonstrating a firm commitment to improving community health and safety.

Mitigation planning is intended to create long-term and ongoing benefits by breaking the cycle of disaster-related losses. A fundamental belief in hazard mitigation is that investments made before a disaster occurs can significantly reduce the need for post-disaster assistance by decreasing the demand for emergency response, repairs, recovery, and reconstruction. Additionally, effective mitigation practices enable residents, businesses, and industries to recover more quickly after a disaster, allowing the community's economy to get back on track sooner and with fewer interruptions.

The advantages of mitigation planning extend beyond merely reducing vulnerability to hazards. Measures such as acquiring or regulating land in high-risk areas can help achieve multiple community objectives (commonly referred to as co-benefits), including preserving open spaces, maintaining environmental health, and enhancing recreational opportunities. Therefore, it is crucial that any local mitigation planning process is integrated with other ongoing local planning efforts. Proposed mitigation strategies must also consider existing community goals and initiatives that could either support or impede their future implementation.

2.2 HISTORY OF HAZARD MITIGATION PLANNING IN THE CABARRUS STANLY UNION REGION

Prior to the development of the Cabarrus Stanly Union Regional Hazard Mitigation Plan in 2014, each of the three counties and jurisdictions participating in the regional plan had previously adopted separate county-level hazard mitigation plans. Each of the county-level plans was developed using the multi-jurisdictional planning process recommended by FEMA. The FEMA approval dates for each of these plans, along with a list of the participating municipalities for each plan, are listed below in **Table 2.1** below.

TABLE 2.1 FEMA APPROVED DATES OF PREVIOUS LOCAL AND COUNTY LEVEL HAZARD MITIGATION PLANS

Plan Name	Plan Date	Jurisdictions Includes
Cabarrus County HMP	1/27/11	Towns of Harrisburg, Midland, Mount Pleasant
City of Concord HMP	12/15/11	City of Concord
City of Kannapolis	9/24/10	City of Kannapolis
Stanly County Multi-Jurisdictional HMP	5/5/11	Towns of Badin, New London, Norwood, Oakboro, Red Cross, Richfield, Stanfield; City of Locust; Village of Misenheimer
City of Albemarle	3/20/12	City of Albemarle
Union County Multi-Jurisdictional HMP	1/24/13	Towns of Fairview, Hemby Bridge, Indian Trail, Marshville, Mineral Springs, Stallings, Unionville, Waxhaw, Weddington, Wingate; City of Monroe; Villages of Lake Park, Marvin, Wesley Chapel

In 2014, all participating jurisdictions collaborated to create a regional plan. No new jurisdictions joined the process, and all those involved in previous planning efforts contributed to the development of the 2014 regional plan. This approach aimed to streamline planning for the jurisdictions in the Cabarrus Stanly Union Region, allowing resources to be shared among participants and reducing the administrative burdens on smaller, lower capacity communities.

The 2014 plan marked an important and successful beginning for regional hazard mitigation planning, and that success has continued into the 2025 update. For the development of the 2025 plan, all the jurisdictions that participated in the development of the 2020 plan participated in this plan's development.

2.3 UPDATING THE PLAN IN 2025

FEMA requires hazard mitigation plans to be updated every five years to maintain eligibility for federal mitigation and public assistance funding. To prepare the 2025 Cabarrus Stanly Union Regional Hazard Mitigation Plan, ESP Associates, Inc. was contracted by North Carolina Emergency Management to provide professional mitigation planning services.

According to the scope of work, the consultant team adhered to the mitigation planning process recommended by FEMA (Publication Series 386 and the Local Mitigation Plan Review Guide) as well as guidelines from North Carolina Emergency Management (NCEM) mitigation planning staff. Notable changes in the 2025 update include increased emphasis on equity and inclusions, integration with climate resilience, enhanced community engagement, and inclusion of substantial damage estimates. These changes are briefly summarized below:

- *Increased Emphasis on Equity and Inclusion* – Plans must demonstrate how they address the needs of vulnerable populations and promote equitable outcomes in hazard mitigation efforts.

- *Integration with Climate Resilience* – There is a stronger focus on incorporating climate change considerations into hazard mitigation planning, including the assessment of future climate risks and how they impact hazard vulnerabilities.
- *Enhanced Community Engagement* – FEMA now requires more robust community engagement processes, ensuring that a wider range of stakeholders, including marginalized communities, are involved in the planning process.
- *Inclusion of Substantial Damage Estimates* – Communities must now include substantial damage estimates in their capability assessment to better understand potential financial impacts and vulnerabilities.

The 2025 update incorporated requirements from the FEMA Community Rating System (CRS) and the Community Wildfire Protection Plan (CWPP). **Tables 2.2** and **2.3** below provide an overview of how the Community Rating System and Community Wildfire Protection Plan requirements were integrated into the updated plan.

TABLE 2.2 FEMA HAZARD MITIGATION PLANNING REQUIREMENTS AND THE CRS 10-STEP PLANNING PROCESS REFERENCE TABLE

FEMA Disaster Mitigation Act Requirement	CRS Activity 510 Planning Requirement
Phase I – Planning Process	
§201.6(c)(1)	Step 1: Organize to Prepare the Plan
§201.6(b)(1)	Step 2: Involve the Public
§201.6(b)(2) & (3)	Step 3: Coordinate
Phase II – Risk Assessment	
§201.6(c)(2)(i)	Step 4: Assess the Hazard
§201.6(c)(2)(ii) & (iii)	Step 5: Assess the Problem
Phase III – Mitigation Strategy	
§201.6(c)(3)(i)	Step 6: Set Goals
§201.6(c)(3)(ii)	Step 7: Review Possible Activities
§201.6(c)(3)(iii)	Step 8: Draft an Action Plan
Phase IV – Plan Maintenance	
§201.6(c)(5)	Step 9: Adopt the Plan
§201.6(c)(4)	Step 10: Implement, Evaluate and Revise the Plan

TABLE 2.3 COMMUNITY WILDFIRE PROTECTION PLAN PROCESS INTEGRATION REFERENCE TABLE

CWPP Process	Hazard Mitigation Plan Integration Reference
Step 1: Convene Decisionmakers	Section 2: Planning Process
Step 2: Involve Federal Agencies	Section 2: Involving Stakeholders
Step 3: Engage Interested Parties	Section 2: Planning Process
Step 4: Establish a Community Base Map	Section 3: Community Profile
Step 5: Develop a Community Risk Assessment	Sections 4, 5 and 6: Hazard Identification, Hazard Profiles and Vulnerability Assessment

CWPP Process	Hazard Mitigation Plan Integration Reference
	Section 7: Capability Assessment
Step 6: Establish Community Hazard Reduction Priorities and Recommendations to Reduce Structural Ignitability	Section 8: Mitigation Strategy
Step 7: Develop an Action Plan and Assessment Strategy	Section 9: Mitigation Action Plans Section 10: Plan Maintenance
Step 8: Finalize the CWPP	Appendix A: Plan Adoption

Source: Preparing a Community Wildfire Protection Plan – A Handbook for Wildland-Urban Interface Communities

The Local Mitigation Plan Review Tool, found in Appendix C, provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this plan. These standards are based upon FEMA's Final Rule as published in the Federal Register in Part 201 of the Code of Federal Regulations (CFR). The planning team used FEMA's Local Mitigation Planning Policy Guide (2022) and Local Mitigation Planning Handbook (2023) for reference as they completed the plan update.

The process used to prepare this plan included twelve major steps that were completed over the course of approximately eleven months beginning in January 2024. Each of these planning steps (illustrated in **Figure 2.1**) resulted in critical work products and outcomes that collectively make up the Plan. Specific plan sections are further described in Section 1: *Introduction*

FIGURE 2.1: MITIGATION PLANNING PROCESS FOR THE CABARRUS STANLY UNION REGION

2.4 THE CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

To facilitate the initial development of the regional plan and its subsequent update, the participating jurisdictions established the Cabarrus Stanly Union Regional Hazard Mitigation Planning Committee. This committee serves as a community-based planning team composed of representatives from various county departments, municipalities, and other essential stakeholders identified as critical partners in the planning process.

Starting in February 2024, the members of the Regional Hazard Mitigation Planning Committee engaged in regular discussions, local meetings, and planning workshops to address and complete tasks related to the preparation of the Plan. This collaborative group coordinated all aspects of plan development and provided invaluable input throughout the process. In addition to their regular meetings, committee members maintained ongoing communication and were kept informed via an email distribution list.

Specifically, the tasks assigned to the Regional Hazard Mitigation Planning Committee members included:

- Participate in Regional Hazard Mitigation Planning Committee meetings and workshops,
- Provide best available data as required for the risk assessment portion of the plan,
- Provide information that will help complete the Capability Assessment section of the plan,
- Provide copies of any mitigation or hazard-related documents for review and incorporation into
- the plan,
- Support the development and update of the Mitigation Strategy, including the design and adoption of regional goal statements,
- Help design and propose appropriate mitigation actions for their department/agency for
- incorporation into the Mitigation Action Plan,
- Review and provide timely comments on all study findings and draft plan deliverables, and
- Support the adoption of the 2025 *Cabarrus Stanly Union Regional Hazard Mitigation Plan.*

Table 2.4 lists the members of the Regional Hazard Mitigation Planning Committee who were responsible for participating in the development of the plan.

TABLE 2.4: MEMBERS OF THE CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

NAME	DEPARTMENT / AGENCY / TITLE	Attended Internal Kickoff Meeting 2/8/24	Attended Stakeholder Kickoff Meeting 3/13/24	Attended HIRA Mitigation Meeting 7/11/24
Cabarrus County and Municipalities				
Ashley, Kevin	City of Concord, Deputy Planning Director		X	X
Barnhardt, Travis	City of Kannapolis, Fire Department			X
Boyd, Robbie	City of Concord, Fire Department Battalion Chief		X	X
Bradley, Jon	Cabarrus County, Risk and Safety Director		X	X
Burnett, Jason	Cabarrus County, Director of Emergency Management		X	X
Case, Joshua	Town of Midland, Deputy Fire Chief		X	
Childers, Braylee	Cabarrus Health Alliance, ARPA Workforce Development Program Coordinator			X
Cook, Timothy	City of Kannapolis, Fire Department			X
Council, Joselyn	City of Kannapolis, Civil Engineering & Planning Intern			X
Crane, Ian	City of Concord, Emergency Management Division Chief		X	X
Daly, Aubrey	Cabarrus Health Alliance, Public Health Policy Associate			X
Deal, Jackie	City of Concord, Engineering Director			X
Eury, Keith	City of Concord, Police Department			X
Foxx, Robbie	Cabarrus County, Deputy Chief Codes Enforcement Officer			X
Graham, Phillip	City of Concord, Transportation Director			X
Grant, Kevin	Cabarrus County, Environmental Management Director		X	X
Gustafson, Dawn	Cabarrus County, Emergency Management Planner	X	X	X
Harris, Rodney	Cabarrus County, CMO		X	
Hatley, Jennifer	Cabarrus Health Alliance, Environmental Health Director			X
Howden, James	Cabarrus County, Finance Director		X	
Love, Matt	Cabarrus County, Director of Construction Standards		X	X
Lunsford-Key, Tamara	Cabarrus Health Alliance, Communicable Disease Program Director			X
McCarty, Elizabeth	City of Kannapolis, Assistant Planning Director			X

NAME	DEPARTMENT / AGENCY / TITLE	Attended Internal Kickoff Meeting 2/8/24	Attended Stakeholder Kickoff Meeting 3/13/24	Attended HIRA Mitigation Meeting 7/11/24
Miesenheimer, Marcus	Cabarrus Health Alliance, Public Health Nurse			X
Morris, Susie	Cabarrus County, Planning Director & Floodplain Administrator		X	
Obiechefu, Udoku	Cabarrus Health Alliance, Epidemiologist			X
Potoczny, Amy	Cabarrus Health Alliance, Public Health Preparedness Coordinator		X	X
Plemmons, Kevin	City of Concord, Deputy Director of Water Resources			X
Roberts, Sam	Cabarrus County, AUXComm		X	X
Sellin, Mark	Cabarrus County, LEP/Civil Air Patrol		X	X
Sells, Jim	Town of Mount Pleasant, Emergency Mgmt Planner		X	X
Sifford, Kelly	Cabarrus County, Assistant County Manager			X
Thomas, Craig	Town of Midland, Planning Director		X	X
Whitehurst, Cole	Cabarrus County, Emergency Management Planner			X
Stanly County and Municipalities				
Allen, Ray	Town of Norwood, Town Administrator		X	
Almond, Jay	Town of Badin, Town Manager		X	
Harvey, Georgia	Town of Oakboro, Town Administrator		X	
Rhodes, Darren	City of Albemarle, Assistant City Manager			X
Roark, Michael	Stanly County, Emergency Management Director/Fire Marshal	X	X	X
Union County and Municipalities				
Amos, Christina	Village of Marvin, Village Manager		X	
Ansley, Andrew	Union County, Emergency Management Director	X	X	X
Arant, Tiffany	Union County, Grants Specialist	X	X	X
Becker, Rick	Town of Mineral Springs, Mayor		X	
Boyack, Scott	Union County, Assistance Emergency Management Coordinator		X	X
Brooks, Vicky	Town of Mineral Springs, Planning Director & Clerk		X	
Broom, Davy	Village of Marvin, Public Works Director		X	X
Campo, Teresa	City of Monroe, Community Development Manager			X
D'Allesandro, Donna	Union County, Training & Development Coordinator			X
Dewey, Karen	Town of Weddington, Town Administrator & Clerk		X	X

NAME	DEPARTMENT / AGENCY / TITLE	Attended Internal Kickoff Meeting 2/8/24	Attended Stakeholder Kickoff Meeting 3/13/24	Attended HIRA Mitigation Meeting 7/11/24
Drye, Chad	Town of Wingate, Police Department Captain		X	X
Gurian, Jason	Union County, Public Health Preparedness Coordinator			X
Jenson, Lee	Union County, Planning Director			
Kindley, Bryan	City of Monroe, Fire Administration Deputy Chief		X	
Liersaph, Chris	Union County, IT Assistant Director			X
McFadden, Bryan	Union County, GIS Manager			X
Mumpower, Amy	Village of Wesley Chapel, Deputy Clerk			X
Scheirer, Sara	Union County, Local Disaster Recovery Manager	X	X	X
Seamon, Will	Union County, Assistant Emergency Management Coordinator		X	
Starnes, Kevin	Town of Waxhaw, Fire Marshal			X
Wells, Jeff	Town of Waxhaw, Town Manager & Planning Director		X	
Other Stakeholders				
Baker, Carl	NCEM, Hazard Mitigation Planner	X	X	
Cannon, Will	American Red Cross, Disaster Program Manager		X	
Crapster, Joe	Duke Energy, District Manager			X
Crew, Chris	NCEM, State Hazard Mitigation Officer	X	X	
Del Rio, Janice	Corning Inc., Environmental Engineer		X	X
DeLude, Hannah	ESP Associates, Hazard Mitigation Planner	X	X	X
Flores, John	ESP, Associates, Hazard Mitigation Planner	X	X	X
Hamby, Karen	NCEM, Multi-Hazard Planner	X		X
Hill, Courtney	American Red Cross, Senior Recruitment Specialist		X	
Langer, Steven	NCEM, Multi-Hazard Planner			X
Leonhart, Rebecca	Atrium Health, Emergency Management Specialist		X	X
Lewis, Richard	American Red Cross, Disaster Recovery Volunteer			X
McIndoe, Patrick	Messer Americas, Operations Technician			X
Mello, John	NCEM, Hazard Mitigation Planner	X		
Rebbeor, Dylan	NC Forest Service, County Ranger			X
Rhyne, Lisa	Piedmont Natural Gas, Stakeholder Engagement Manager			X
Skinner, Steven	Corning Inc., Environmental Health Specialist		X	

NAME	DEPARTMENT / AGENCY / TITLE	Attended Internal Kickoff Meeting 2/8/24	Attended Stakeholder Kickoff Meeting 3/13/24	Attended HIRA Mitigation Meeting 7/11/24
Slaughter, Nathan	ESP Associates, Hazard Mitigation Dept. Manager	X	X	X
Streba, Catrina	Atrium Health, Emergency Management Specialist			X
Stroud, Carrie	Union Power Cooperative, Vice President of Communications & Marketing			X
Thomas, Jake	Union Power Cooperative, Manager of Marketing & Energy Services			X
Wegner, Marther	Duke Energy, District Manager			X
Wiseman, Eric	NCEM, Area Coordinator	X		X

Table 2.5 lists points of contact for several of the jurisdictions who elected to designate their respective county officials to represent their jurisdiction on the planning team, generally because they did not have the time or staff to be able to attend on their own. Although these members designated county officials to represent them at in-person meetings, each was still contacted throughout the planning process and participated by providing suggestions and comments on the plan, updates to mitigation actions and the capability assessment via email and phone conversations.

TABLE 2.5: MEMBERS DESIGNATING REPRESENTATIVES TO CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLANNING COMMITTEE

NAME	DEPARTMENT / AGENCY / TITLE	JURISDICTION
Alberta, Shannon	Town Clerk	Red Cross
Blair, Anita	Village Administrator/Clerk	Misenheimer
Clark, Cheri	Zoning Administrator	Lake Park
Capps, Carolyn	Town Administrator	Richfield
Correa, Cesar	City Manager	Locust
Daniels, Tate	Mayor	New London
Deese, Brandi	Planning Director	Indian Trail
Dunn, Bryan	Fire Chief	Harrisburg
Gaddy, Sonya	Land Use Administrator/Town Clerk	Unionville
Helms, Bridgette	Town Administrator	Stanfield
Humphries, Ed	Land Use Administrator/Deputy Clerk	Fairview
Pressley, Kevin	Mayor	Hemby Bridge
Sewell, Alex	Town Manager	Stallings
Wells, Jonathon	Planning & Zoning Administrator	Marshville

Additional participation and input from other identified stakeholders and the public was sought

by the participating counties during the planning process through phone calls and the distribution of emails, advertisements, and public notices aimed at informing people on the status of the Hazard Mitigation Plan (public and stakeholder involvement is further discussed later in this section).

2.4.1 Multi-Jurisdictional Participation

The Cabarrus Stanly Union Regional Multi-Jurisdictional Hazard Mitigation Plan includes three counties, and twenty-nine (29) incorporated municipalities. To satisfy multi-jurisdictional participation requirements, each county and its participating jurisdictions were required to perform the following tasks:

- Participate in mitigation planning workshops,
- Provide implementation status updates on previously identified mitigation actions,
- Identify completed mitigation projects (if applicable); and
- Develop and adopt (or update) their local mitigation action plan.

Each participating jurisdiction has developed a local mitigation action plan unique to their jurisdiction. This provides the means for jurisdictions to implement, monitor and track progress, and update their mitigation actions on a regular basis.

2.5 COMMUNITY MEETINGS AND WORKSHOPS

The preparation of the plan involved a series of meetings and workshops designed to facilitate discussion, build consensus, and initiate data collection efforts with local government staff, community officials, and other identified stakeholders. Importantly, these meetings and workshops encouraged ongoing input and feedback from relevant participants throughout the drafting stages of the plan. Below is a summary of the key meetings conducted during the plan update process. Meeting minutes were recorded and are documented in Appendix D.

Table 2.6 summarizes key meetings and workshops held by the HMPC during the development of the plan. In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency. For example, seeking approval of specific mitigation actions for their department or agency to undertake and include in their mitigation action plan. These meetings were informal and are not documented here. Public involvement is summarized in the subsequent section.

TABLE 2.6: CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLANNING COMMITTEE MEETING SUMMARY

MEETING	MEETING TOPIC	DATE	LOCATION
County Leads – Internal Kickoff	1. Introduction to project team and county leads 2. Review of mitigation, project scope, and tentative project schedule 3. Discussion on stakeholder engagement and citizen contacts	2/8/24	Virtual Microsoft Teams

MEETING	MEETING TOPIC	DATE	LOCATION
HMPC Mtg #1 - Project Kick-Off	4. Introduction to DMA requirements and the planning process 5. Review HMPC responsibilities and project schedule	3/13/24	2258 Concord Ave Monroe, NC 28110
HMPC Mtg #2 - HIRA/Mitigation Strategy Mtg (combined)	1. Review Draft Hazard Identification and Risk Assessment (HIRA) 2. Review asset inventory and discuss critical facilities 3. Review Capability Assessment and Mitigation Strategies 4. Solicit comments and feedback	7/11/24	4855 Milestone Ave Kannapolis, NC 08081

2.6 INVOLVING THE PUBLIC

44 CFR Requirement
44 CFR Part 201.6(b)(1): The planning process shall include an opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

An important component of the mitigation planning process involved public participation. Individual resident and community-based input provides a better understanding of local concerns, increases community buy-in and support, and heightens likelihood of mitigation action implementation. As residents become more involved in decisions that affect their safety, they are more likely to gain a greater awareness of the hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community's overall mitigation strategy aimed at making a home, neighborhood, school, business or entire planning area safer from the potential effects of hazards.

Public involvement in the development of the Cabarrus Stanly Union Regional Hazard Mitigation Plan was sought using several methods:

- Conducting open public meetings (virtual),
- Developing a project website to share project status and relevant resources,
- Providing online notices,
- Sharing the public participation survey online and in-person, and
- Making the draft plan available online for public review.

The public was provided multiple opportunities to be involved in the development of the regional plan at three distinct periods during the planning process: (1) during the drafting stage of the plan, (2) upon completion of a draft plan, but prior to official plan approval and adoption, and (3) just prior to plan adoption. **Table 2.7** summarizes public involvement efforts employed during the plan update process. Documentation of these efforts is provided in Appendix D.

TABLE 2.7: CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLAN UPDATE PUBLIC ENGAGEMENT OPPORTUNITIES AND MEASURES

OUTREACH TYPE	OUTREACH DESCRIPTION	DATE	LOCATION
Public Survey	• Shared online via municipal and county websites • Shared in-person at government and community facilities • Respondents could complete anonymously or provide name/email • Input used to inform potential mitigation strategies	-	Online Survey Planet
Project Website	• Provides general overview of mitigation and planning process • Summarizes project-specific timeline and tasks • Links to valuable resources including HMPC meeting minutes and presentations	-	Online ARCGIS Story Maps
Public Notices	• Project updates shared on municipal and county websites • Links provided to existing plan and draft plan	-	Online Municipal Websites
Public Meeting #1	• Introduction to DMA, CRS, and FMA requirements and planning process • Review of identified hazards and potential mitigation strategies • Review Draft Hazard Mitigation Plan and collect public comment	2/11/25	Virtual Microsoft Teams
Plan Adoption Meetings	• Local review, approval and adoption of the plan.	Various	Various

Meeting Minutes from Public Meeting
February 11, 2025
Virtual Meeting
On February 11, 2025, a virtual public meeting for the Cabarrus, Stanly, Union Regional Hazard Mitigation Plan Update was held to educate and inform the public on the development of the draft plan as well as to discuss next steps in the process. In addition to raising public awareness, the aim of this meeting was to offer the public an opportunity to ask questions and provide feedback/input to enhance plan relevance.

The meeting aimed to define hazard mitigation and explore its various types, focusing on existing developments' vulnerability and ensuring future developments minimize risks. Key mitigation techniques discussed included prevention strategies, property protection measures, natural resource management, structural projects, and emergency services enhancements. The update reflects changing

risks due to increased development and a shift toward an "all hazards" approach, incorporating climate change considerations.

The project overview highlighted the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), emphasizing that hazard mitigation planning is essential for maintaining eligibility for federal funding programs, such as Flood Mitigation Assistance (FMA), Building Resilient Infrastructure and Communities (BRIC), and the Hazard Mitigation Grant Program (HMGP).

The planning process was reviewed, which outlined a four-step update process: organizing resources, conducting a risk assessment, developing a mitigation plan, and final adoption and implementation. The structure of the plan was also reviewed during this meeting to facilitate clarity and understanding, sharing the breakdown of plan sections such as hazard identification, risk assessment, and mitigation action strategies.

Key findings were also shared with meeting participants including the priority risk index (PRI) as well as public survey findings. The tabulated PRI results were presented, categorizing hazards into high, moderate, and low-risk groups. High-risk hazards identified included cyber, excessive heat, tornadoes/thunderstorms, flooding, and infectious disease. Initial findings from the public survey revealed tornadoes/thunderstorms as the highest perceived threat, with significant interest in hazard resilience measures.

Next steps were shared toward the end of the meeting, including the integration of any additional feedback received at the public meeting, the submittal of the plan to both NCEM and FEMA for review and approval, and the local adoption process. For timing purposes, the local adoption process can occur simultaneously with NCEM and FEMA review, so once approved, the plan will be officially adopted. The adoption process may vary per community, but the most common approach is adoption by resolution. Furthermore, in addition to the previously mentioned opportunities for public involvement, each participating jurisdiction will hold public meetings before the final plan is officially adopted by local governing bodies. These meetings will take place at different times once FEMA grants conditional approval of the plan. Adoption resolutions will be included in Appendix A.

2.6.1 Public Participation Survey

The Regional Hazard Mitigation Committee successfully engaged residents in the mitigation planning process through the Public Participation Survey. This survey was specifically designed to gather data and insights from residents of Cabarrus, Stanly, and Union Counties.

Copies of the Public Participation Survey were distributed to the Regional Hazard Mitigation Committee, ensuring they were available for residents to complete at local public offices. Additionally, a link to an electronic version of the survey was posted on county and municipal websites. In total, 225 survey responses were received, providing valuable input for the Committee to consider updating the plan. Selected survey results are presented below. Full results can be found in Appendix D.

- Approximately 49 percent of survey respondents had been impacted by a disaster, mainly hurricanes, tornadoes, and winter storms.

- Respondents ranked Tornadoes/Thunderstorms as the highest threat to their neighborhood (41 percent), followed by Flooding (16 percent), and Excessive Heat (8 percent).
- Approximately 54 percent of respondents have taken actions to make their homes more resistant to hazards and 85 percent are interested in making their homes more resistant to hazards.
- 78 percent of respondents do not know what office to contact regarding reducing their risks to hazards.
- Emergency Services and Prevention were ranked as the most important activities for communities to pursue in reducing risks.

2.7 INVOLVING THE STAKEHOLDERS

44 CFR Requirement
44 CFR Part 201.6(b)(2): The planning process shall include an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other non-profit interests to be involved in the planning process.

At the outset of the planning process, the project consultant collaborated with the emergency management leaders from each county to initiate stakeholder outreach. At this time, a list was distributed of recommended stakeholders derived from FEMA Publication 386-1, titled *Getting Started: Building Support for Mitigation Planning,* which highlights the diverse range of stakeholders considered for participation in plan development. County emergency management leaders referenced this list while inviting stakeholders from their respective counties to engage in the planning process. Additionally, FEMA's *Local Mitigation Planning Policy Guide* (2023) and *Local Mitigation Planning Handbook* (2023) were reviewed to ensure all elements for participation were addressed.

The participating jurisdictions invited representatives from the health departments, social services departments, and planning departments to advocate for and provide insight on underserved and socially vulnerable populations in the region. In addition to staff representatives of each participating jurisdiction, the HMPC included a variety of stakeholders, including representatives from the American Red Cross, Atrium Health, Cabarrus Health Alliance (CHA), North Carolina Emergency Management (NCEM), North Carolina Forest Service, and others (see subsequent subsections). Input from neighboring communities was also solicited through invitations to the public meetings (see Appendix D).

The Regional Hazard Mitigation Committee actively promoted open and widespread participation in the mitigation planning process. The region also excelled in local outreach efforts by designing and distributing the Public Participation Survey. This initiative allowed local officials, residents, businesses, academics, and other private interests in the Cabarrus Stanly Union Region to engage and provide input throughout the local mitigation planning process.

2.8 DOCUMENTATION OF PLAN PROGRESS

This plan update documents the progress made in hazard mitigation planning for the participating jurisdictions in the Cabarrus Stanly Union Region. Since the initial hazard mitigation plans were

developed in the late 1990s and early 2000s, numerous mitigation actions have been completed and implemented across these jurisdictions. These actions are designed to reduce the overall risk posed by natural hazards to the people and properties in the region. A detailed account of these completed actions can be found in Appendix E.

Further details on the progress of plan implementation are provided in the capability assessment. Community capabilities have continued to improve in each participating jurisdiction through the adoption of new plans, policies, and programs that promote hazard mitigation at the local level. The status of local capabilities for these jurisdictions is outlined in *Section 7: Capability Assessment*. The participating jurisdictions demonstrate their ongoing commitment to hazard mitigation by reconvening every five years to update the plan and actively involving the public in the planning process.

2.9 CABARRUS COUNTY CRS PLANNING PROCESS DOCUMENTATION

As a participant in the NFIP's CRS program, Cabarrus County has taken additional steps during the 2025 update of this plan to meet the CRS requirements of Activity 510: Floodplain Management Planning and attempt to maximize the number of points the County receives for this activity for this plan.

Cabarrus County staff were assigned to serve on the Regional Hazard Mitigation Planning Committee. The staff members assigned to the committee actively participated in the plan update process and represent a wide range of staff expertise in the areas of mitigation techniques. The Cabarrus County staff and their associated area of expertise are listed in **Table 2.8**.

TABLE 2.8: CABARRUS COUNTY STAFF MEMBERS OF THE CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLANNING TEAM AND THEIR AREA OF EXPERTISE

NAME	TITLE DEPARTMENT	MITIGATION TECHNIQUE					
		PREVENTION MEASURES	PROPERTY PROTECTION	NATURAL RESOURCE PROTECTION	EMERGENCY SERVICES	STRUCTURAL PROJECTS	PUBLIC EDUCATION
Bradley, Jon	Risk & Safety Director	X			X		
Burnett, Jason	EM Director	X	X	X	X	X	X
Foxx, Robbie	Deputy Chief CEO	X	X				X
Grant, Kevin	Environmental Management Director	X		X			X
Gustafson, Dawn	EM Planner	X	X	X	X	X	X
Hatley, Jennifer	CHA Environmental Health Director	X		X			X
Howden, James	Finance Director					X	X
Love, Matt	Director of Construction Standards	X	X				X

NAME	TITLE DEPARTMENT	MITIGATION TECHNIQUE					
		PREVENTION MEASURES	PROPERTY PROTECTION	NATURAL RESOURCE PROTECTION	EMERGENCY SERVICES	STRUCTURAL PROJECTS	PUBLIC EDUCATION
Lunsford-Keys, Tamara	CHA Communicable Disease Program Director	X			X		X
Morris, Susie	Planning Director & Floodplain Administrator	X	X	X	X	X	X
Potoczny, Amy	CHA Public Health Preparedness Coordinator	X			X		X
Robert, Sam	AUXComm				X		
Sellin, Mark	LEP/CAP				X		
Sifford, Kelly	Assistant County Manager	X					X
Whitehurst, Cole	EM Planner	X	X	X	X	X	X

Cabarrus County also established a separate CRS Steering Committee comprised of 50% public sector and 50% private sector. This was done to meet the requirements of CRS Planning Step 2. The members of the CRS Steering Committee for Cabarrus County are listed in **Table 2.9.**

TABLE 2.9: CABARRUS COUNTY NFIP CRS STEERING COMMITTEE

NAME	AGENCY/TITLE
Burnett, Jason	Cabarrus County, Director of Emergency Management
Cannon, Will	American Red Cross, Disaster Program Manager
Del Rio, Janice	Corning Inc., Environmental Engineer
Howden, James	Cabarrus County, Finance Director
Leonhart, Rebecca	Atrium Health, Emergency Management Specialist
Love, Matt	Cabarrus County, Director of Construction Standards
McIndoe, Patrick	Messer Americas, Operations Technician
Morris, Susie	Cabarrus County, Planning Director & Floodplain Administrator

The formation of the Cabarrus County CRS Steering Committee represents a strategic approach to floodplain management, emphasizing the importance of collaboration among a diverse range of stakeholders. This diverse representation is crucial for fostering a comprehensive understanding of the unique challenges and opportunities that the community faces regarding flood risk and resilience. The relevance each role of the selected CRS committee members is described below:

- Emergency Management – At the forefront of the committee is the Cabarrus County Director of Emergency Management**.** This role is essential for coordinating disaster response and preparedness strategies that align with local, state, and federal requirements. Their leadership

ensures that emergency management principles are integrated into all CRS initiatives, facilitating a proactive approach to flood risk.

- Community Support and Resources – The inclusion of the American Red Cross Disaster Program Manager brings critical expertise in disaster response and community education. Their experience in mobilizing resources and providing support during emergencies enhances the committee's capacity to promote preparedness and resilience among residents, ensuring that vulnerable populations are prioritized.
- Environmental Stewardship – The partnership with Environmental Engineer at Corning Inc. underscores the County's commitment to sustainable practices. This stakeholder's knowledge of environmental regulations and mitigation strategies helps align floodplain management with ecological considerations, ensuring that initiatives not only protect the community but also preserve valuable natural resources.
- Financial Accountability – The Cabarrus County Finance Director plays a pivotal role in ensuring that the financial aspects of the CRS initiatives are managed effectively. Their involvement guarantees that resources are allocated efficiently, supporting budgetary transparency and the successful implementation of flood mitigation projects.
- Health and Safety – The presence of the Atrium Health Emergency Management Specialist emphasizes the importance of public health in flood planning. Their insights into health risks associated with flooding inform strategies, ensuring that healthcare facilities are prepared to respond to emergencies and maintain critical services during disasters.
- Regulatory Compliance – The Cabarrus County Director of Construction Standards ensures that floodplain management efforts are grounded in sound building practices. Their expertise is vital for promoting flood-resistant construction, helping to mitigate future risks and ensuring compliance with NFIP standards.
- Operational Insights – Including Messer Americas' Operations Technician provides valuable insights into the operational aspects of flood management, particularly concerning industrial facilities. Their experience can help enhance the preparedness of local businesses in the face of flooding, ensuring continuity of operations and safety.
- Strategic Planning and Administration – The Cabarrus County Planning Director and Floodplain Administrator serves as a linchpin for integrating land use planning with floodplain management. Their dual role ensures that zoning regulations and development practices are aligned with flood mitigation goals, promoting sustainable growth while reducing flood risks.

2.10 CITY OF CONCORD CRS PLANNING PROCESS DOCUMENTATION

The City of Concord also participates in the CRS and has taken additional steps during the planning process for this update to ensure points will be earned for Activity 510.

City of Concord staff were assigned to serve on the Regional Hazard Mitigation Planning Committee. The staff members assigned to the committee actively participated in the plan update process and

represent a wide range of staff expertise in the areas of mitigation techniques. The City of Concord staff and their associated area of expertise are listed in **Table 2.10**.

TABLE 2.10: CITY OF CONCORD MEMBERS OF THE CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLANNING TEAM AND THEIR AREA OF EXPERTISE

NAME	TITLE DEPARTMENT	MITIGATION TECHNIQUE					
		PREVENTION MEASURES	PROPERTY PROTECTION	NATURAL RESOURCE PROTECTION	EMERGENCY SERVICES	STRUCTURAL PROJECTS	PUBLIC EDUCATION
Ashley, Kevin	Deputy Planning Director	X		X			X
Crane, Ian	EM Division Chief	X	X	X	X	X	X
Deal, Jackie	Engineering Director	X	X	X		X	
Eury, Keith	Police Department				X		X
Graham, Phillip	Transportation Director	X			X	X	X
Plemmons, Kevin	Deputy Director of Water Resources	X		X		X	

Additionally, the City of Concord established a separate CRS Steering Committee comprised of 50% public sector and 50% private sector. This was done to meet the requirements of CRS Planning Step 2. The members of the CRS Steering Committee for the City of Concord are listed in **Table 2.11.**

TABLE 2.10: CITY OF CONCORD MEMBERS OF THE CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLANNING TEAM AND THEIR AREA OF EXPERTISE

NAME	AGENCY/TITLE
Ashley, Kevin	City of Concord, Deputy Planning Director
Crane, Ian	City of Concord, Emergency Management Division Chief
Crapster, Joe	Duke Energy, District Manager
Deal, Jackie	City of Concord, Engineering Director
Plemmons, Kevin	City of Concord, Deputy Director Water Resources
Rhyne, Lisa	Duke Energy, Stakeholder Engagement Manager
Skinner, Steven	Corning Inc., Environmental Health Specialist
Streba, Catrina	Atrium Health, Emergency Management Specialist

The formation of the City of Concord NFIP CRS Steering Committee reflects a thoughtful approach to flood risk management and community resilience, bringing together a diverse group of stakeholders who collectively represent critical sectors in the community. Each selected member plays a vital role in addressing the multifaceted challenges associated with floodplain management and disaster preparedness. The relevance each role of the selected CRS committee members is described below:

- Strategic Planning – The City of Concord Deputy Planning Director brings expertise in urban planning and development, ensuring that land use policies align with floodplain

management objectives. Their knowledge is essential for integrating flood risk considerations into the community's growth strategies.

- Disaster Response and Recovery – The City of Concord Emergency Management Division Chief is tasked with overseeing disaster response and recovery efforts. This individual ensures that emergency protocols are in place to protect residents during flooding events. Their leadership is crucial for coordinating responses and educating the community about flood risks.
- Essential Services – As a key utility provider, the Duke Energy District Manager represents the interests of energy infrastructure, which is vital during flood events. Their participation ensures that the committee considers the resilience of energy services, minimizing disruptions during emergencies.
- Resilient Infrastructure – The City of Concord Engineering Director is pivotal for designing and maintaining infrastructure that can withstand flooding, such as stormwater systems and levees. Their expertise in civil engineering is crucial for implementing effective flood mitigation measures.
- Environmental Stewardship – Representing the private sector, the Environmental Health Specialist at Corning Inc. brings a unique perspective on environmental impacts and corporate responsibility. Their expertise can help the committee understand how development practices intersect with community health and safety during flooding.
- Health and Safety – The Emergency Management Specialist at Atrium Health focuses on public health and emphasizes the importance of health services during disasters. Their insights into emergency health protocols and community wellness are vital for ensuring that flood response plans protect vulnerable populations.
- Relationship Building – The Stakeholder Engagement Manager at Duke Energy focuses on communication and partnership-building with the community and other stakeholders. Their presence on the committee ensures that public engagement is prioritized, fostering strong relationships between the utility and residents regarding flood preparedness.

SECTION 3
COMMUNITY PROFILE

This section of the plan provides a general overview of the Cabarrus Stanly Union Region. It consists of the following four subsections:

- 3.1 Geography and the Environment
- 3.2 Population and Demographics
- 3.3 Housing, Infrastructure, and Land Use
- 3.4 Employment and Industry

3.1 GEOGRAPHY AND THE ENVIRONMENT

The Cabarrus Stanly Union Region is located in the south-central portion of the Piedmont of North Carolina. Cabarrus and Union Counties are part of the Charlotte-Concord-Gastonia NC Metropolitan Statistical Area (MeSA) and Stanly County is part of the Albemarle NC Micropolitan Statistical Area (MiSA), both of which fall within the larger Charlotte-Concord NC Combined Statistical Area. The planning areas includes incorporated and unincorporated Cabarrus, Stanly, and Union counties along with 29 participating municipalities *(see Section 1: Introduction).*

The region comprises a total land area of over 1,409 square miles. The total land area reported for each participating county is presented in **Table 3.1**.

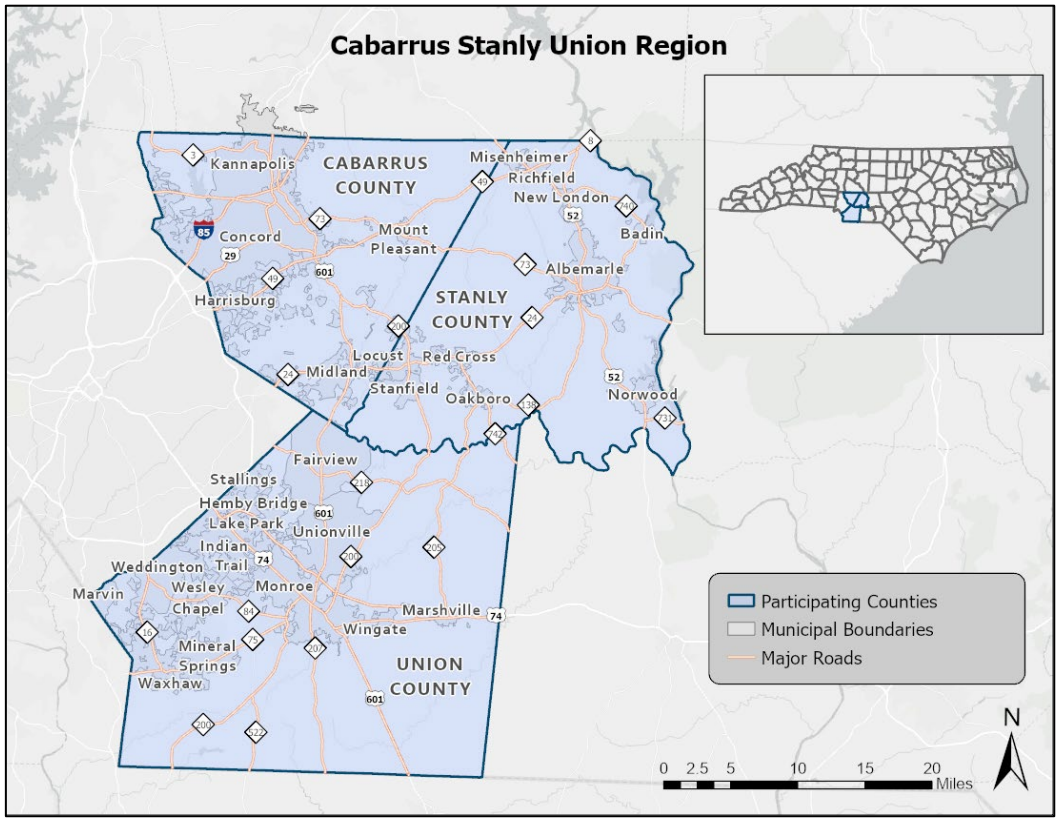
TABLE 3.1: TOTAL LAND AREAS OF PARTICIPATING COUNTIES

County	Total Land Area
Cabarrus County	365 square miles
Stanly County	404 square miles
Union County	640 square miles
Region Total	**1409 square miles**

Source: United States Census Bureau

The region offers convenient access to the metropolitan area of Charlotte while preserving its small-town, rural environment. It is one of the fastest-growing areas in North Carolina, characterized by vibrant suburban and industrial growth alongside expansive natural spaces that remain untouched by development. The region boasts numerous parks and recreational opportunities, enhancing the quality of life for residents and visitors alike. Tourism thrives through various events, including the Queen's Cup Steeplechase and the NASCAR Monster Energy Cup Series held at Charlotte Motor Speedway, as well as significant historical sites such as the Reed Gold Mine, a designated National Historic Landmark. An orientation map can be found in **Figure 3.1**.

FIGURE 3.1: CABARRUS STANLY UNION REGION ORIENTATION MAP



According to the Köppen climate classification system, the Cabarrus Stanly Union Region is categorized as a humid subtropical climate like much of North Carolina. This climate zone is characterized by mild winters and hot humid summers with significant precipitation even during the driest month. Based on the National Centers for Environmental Information (NCEI) data, the region exhibits a temperate climate with an average annual temperature of 61.6°F over the last ten years. The average temperatures and precipitation of each of the participating counties is presented in **Table 3.2**.

TABLE 3.2: ANNUAL AVERAGE TEMPERATURES AND PRECIPITATION OF PARTICIPATING COUNTIES

County	12-Month Avg Temp (2014-2024)	January Annual Avg Min Temp (2014-2024)	January Annual Avg Max Temp (2014-2024)	June Annual Avg Min Temp (2014-2024)	June Annual Avg Max Temp (2014-2024)	12-Month Avg. Rainfall (2014-2024)
Cabarrus County	61˚F	30.6˚F	51.7˚F	64.5˚F	87.2˚F	48.74in
Stanly County	61.8˚F	31.5˚F	52.5˚F	65.3˚F	87.5˚F	50.02in
Union County	62˚F	31.6˚F	53.1˚F	65.5˚F	87.8˚F	44.47in
Region Average	**61.6˚F**	**31.2˚F**	**52.4˚F**	**65.1˚F**	**87.5˚F**	**47.7˚F**

Source: National Centers for Environmental Information: Climate at a Glance (Time Series)

In January, the region experiences an average minimum temperature of 31.2°F and an average maximum temperature of 52.4°F, respectively. These values indicate a moderate winter climate, which suggests that the region experiences conditions that can lead to freezing events and potential winter

storms. Effective hazard mitigation strategies must account for the risks associated with these cold weather patterns, such as ice accumulation, power outages, and increased demand for heating resources.

During the month of June, the region experiences a significant increase in temperatures. Average minimum temperatures rise to approximately 65.1°F and average maximum temperatures reach 87.5°F, indicating a shift to a warm and humid summer. This not only affects human health, potentially increasing the incidence of heat-related illnesses, but also heightens the risk of wildfires and heatwaves. Understanding these temperature fluctuations is essential for developing adaptive strategies to protect vulnerable populations and infrastructure.

Regarding precipitation, the region averages about 47.7 inches of annual rainfall, with Stanly County receiving the highest at approximately 50.02 inches. This consistent rainfall contributes to the region's hydrology and supports its diverse ecosystems. Rainfall in the region is generally well-distributed throughout the year, with the driest conditions typically occurring in the fall. Summer precipitation is primarily attributed to thunderstorms, and there may be occasional dry spells lasting from one to three weeks. The annual average precipitation equates to approximately four inches per month.

Consistent rainfall supports agriculture and biodiversity, but also poses challenges related to flooding and water management. The well-distributed rainfall throughout the year necessitates robust flood management systems and infrastructure. Thunderstorms can bring intense, localized rainfall, leading to flash flooding, which can overwhelm drainage systems and pose risks to life and property. Therefore, strategies such as improving stormwater management, enhancing drainage systems, and implementing green infrastructure can enhance resilience against such hazards.

3.1.1 Natural Features

Most of the Cabarrus Stanly Union Region falls within the Rocky River Watershed of the Yadkin Pee Dee River Basin. A considerable portion of southwest Union County falls within the Lower Catawba Watershed and small southern portions of the county are in the Lynches and Upper Pee Dee Watersheds. Eastern Stanly County is comprised of the Upper Pee Dee Watershed while a small northern section is located in the Lower Yadkin Watershed. These natural systems play a vital role in managing water flow, filtering pollutants, and supporting biodiversity. They also serve as natural buffers against extreme weather events, helping to absorb excess rainfall and reduce the impact of storms.

As part of the Piedmont, the Cabarrus Stanly Union Region features rolling countryside without prominent peaks. It lies adjacent to the Uwharrie Lakes section of the North Carolina Piedmont. The Uwharrie Mountains extend across the northeastern part of Stanly County, with foothills reaching into Cabarrus and Union Counties. Lake Lynn is an 18-acre natural lake in Cabarrus County while Badin and Tillery Lakes form much of the eastern border of Stanly County. These lakes play a crucial role in the region’s hydrology, serving as buffers against flooding.

3.1.2 Parks, Preserves, and Conservation

There are numerous local, state, and national parks and recreation areas within the region. Morrow Mountain State Park, located in Stanly County, is the only designated state park in the region. The Uwharrie National Forest, a federally designated national forest region, in Montgomery County abuts Stanly County. Cabarrus County contains four county-wide parks, Stanly County contains 22 parks, and

Union County contains three parks. The Carolina Thread trail also winds its way through the Cabarrus Stanly Union Region as part of a regional trial and greenway network that provides connectivity to surrounding areas.

3.1.3 Threatened and Endangered Species

The U.S. Fish and Wildlife Service maintains a regular listing of threatened species, endangered species, species of concern, and candidate species for counties across the United States. As of 2024 records, the Cabarrus Stanly Union Region has 12 species that are listed with the U.S. Fish and Wildlife Services as threatened, endangered, proposed endangered, proposed threatened, species of concern, or under review. **Table 3.3** summarizes these identified species below.

TABLE 3.3: THREATENED AND ENDANGERED SPECIES OF PARTICIPATING COUNTIES

Group	Common Name	Scientific Name	Federal Status
Mammals	Tricolored Bat	Perimyotis Subflavus	Proposed Endangered
Flowering Plants	Michauz's Sumac	Rhus Michauxii	Endangered
Clams	Carolina Heelsplitter	Lasmigona Decorata	Endangered
Insects	Monarch Butterfly	Danaus Plexippus	Proposed Threatened
Mammals	Little Brown Bat	Myotis Lucifugus	Under Review
Flowering Plants	Schweinitz's Sunflower	Helianthus Schweinitzii	Endangered
Crustaceans	Pee Dee Crayfish Ostrcod	Dactylocythere Peedeensis	Species of Concern
Clams	Atlantic Pigtoe	Fusconaia Masoni	Threatened
Flowering Plants	Ravine Sedge	Carex Impressinervia	Under Review
Clams	Yellow Lampmussel	Lampsilis Cariosa	Species of Concern
Fish	Robust Redhorse	Moxostoma Robustum	Under Review
Flowering Plants	Piedmont Aster	Eurybia Mirabilis	Species of Concern

Source: US Fish & Wildlife Service, Environmental Conservation Online System (ECOS)

3.2 POPULATION AND DEMOGRAPHICS

According to Census data, the Cabarrus Stanly Union Region experienced a 19.7 percent population increase between 2010 and 2020, averaging a 2 percent growth rate per year. This rate outpaces the State of North Carolina as a whole, the fifth fastest growing state in the county, which grew by 9.5 percent between 2010 and 2020. Population counts from the US Census Bureau for 2000, 2010, 2020, and 2023 for each of the participating counties are presented in **Table 3.4**.

TABLE 3.4: POPULATION COUNTS FOR PARTICIPATING COUNTIES

Jurisdiction	2000 Census Population	2010 Census Population	2020 Census Population	2023 Population Estimates	% Change 2010-2020
Cabarrus County	131,063	178,011	225,804	240,016	26.8%
Stanly County	58,100	60,585	62,504	65,699	3.2%
Union County	123,677	201,292	238,234	256,452	18.4%
Region Total	**312,840**	**439,888**	**526,542**	**562,167**	**19.7%**

Source: United States Census Bureau

A growth rate exceeding the state average is indicative of an increasing population density in the Cabarrus Stanly Region. This increase translates to greater demand for housing, transportation, healthcare, and public services. It is essential to consider how this population growth will strain existing infrastructure and services during emergencies.

The Cabarrus Stanly Union Region's growth rate is significant as it reflects both opportunities and challenges. This growth necessitates proactive hazard mitigation planning and resilience strategies to ensure that the region can accommodate its expanding population while safeguarding against natural and human-caused hazards. By integrating population growth into hazard planning, the region can enhance its preparedness, protect its residents, and promote sustainable development.

According to 2023 American Community Survey 1-Year Estimates, the median age in the Cabarrus Stanly Union Region was 39.9. Of the population aged 25 years and over, 25.6 percent have a high school degree or higher and 21.6 percent have a bachelor's degree or higher. Approximately 18.4 percent of the region's residents speak a language other than English at home. The racial characteristics of the participating jurisdictions are presented in **Table 3.5.** Generally, white persons make up the majority of the population in the region, accounting for over 76.4 percent of the population. However, this may vary per jurisdiction.

TABLE 3.5: DEMOGRAPHICS OF PARTICIPATING COUNTIES

Jurisdiction	White, %	Black, %	Other Race, %	Asian, Percent	Persons of Hispanic Origin, %*	Two or More Races, %
Cabarrus County	67.1%	22.3%	0.9%	7%	13%	2.7%
Stanly County	83.3%	12.1%	0.8%	2%	6%	1.7%
Union County	78.7%	12.9%	0.8%	5.2%	13.6%	2.4%
Region Average	**76.4%**	**15.8%**	**0.8%**	**4.7%**	**10.9%**	**2.3%**

*Hispanics may be of any race, so also are included in applicable race categories

Source: United States Census Bureau

The demographic landscape of the Cabarrus, Stanly, and Union counties reveals significant insights into the regional diversity that should be considered in the Hazard Mitigation Plan Update. In Cabarrus County, the population is predominantly White at 67.1 percent, with notable representations of Black or African American individuals at 22.3 percent, and a Hispanic origin population of 13 percent. This indicates a relatively diverse community that may have varying needs and perspectives in hazard mitigation and response.

Stanly County shows a higher percentage of White residents at 83.3 percent, with a smaller Black or African American population of 12.1 percent and a Hispanic origin demographic of 6%. Union County presents a middle ground with 78.7 percent White residents and a Hispanic origin population of 13.6 percent, alongside a Black or African American demographic of 12.9 percent. This suggests a less diverse community than Cabarrus County, which may influence the nature of local hazards and the effectiveness of outreach efforts.

The variations in racial and ethnic compositions across these counties highlight the importance of tailored approaches in hazard mitigation strategies that respect and address the unique cultural and

social dynamics of each community. Overall, these demographics underscore the necessity for inclusive planning that engages all segments of the population to enhance resilience and preparedness in the face of potential hazards.

3.3 HOUSING, INFRASTRUCTURE, AND LAND USE

3.3.1 Housing

According to the US Census Bureau, there were 216,256 housing units in the Cabarrus Stanly Union Region in 2023. Most of these housing units are owner-occupied. Housing information for the three participating counties is presented in **Table 3.6**.

TABLE 3.6: HOUSING CHARACTERISTICS OF PARTICIPATING COUNTIES

Jurisdiction	Housing Units (2010)	Housing Units (2023)	Owner-Occupied Housing Units (2020), %	Renter-Occupied Housing Units (2020), %	Median Home Value Owner-Occupied (2019-2023)
Cabarrus County	71,937	95,942	65.7%	28.7%	$318,600
Stanly County	27,110	29,009	64.5%	24.9%	$214,300
Union County	72,870	91,305	77.9%	17.8%	$374,400
Region	**171,917**	**216,256**	**69.4%**	**23.8%**	**$302,400**

Source: United States Census Bureau

The housing trends across the Cabarrus Stanly Union Region highlight the necessity for a nuanced approach to hazard mitigation planning. As the region continues to evolve, understanding the unique characteristics and needs of each county will be essential for hazard mitigation. Key findings and themes are summarized below:

- Growth in Housing Units – Both Cabarrus and Union Counties have experienced substantial growth in housing units, with increases from 71,937 to 95,942 in Cabarrus and from 72,870 to 91,305 in Union. This growth indicates a trend toward urbanization and population influx, which can strain infrastructure and emergency services.
- Owner-Occupied Housing Rates – Union County leads with a high owner-occupied rate of 77.9 percent, followed closely by Cabarrus at 65.7 percent. This suggests a demographic that may be more economically stable and better positioned to undertake mitigation strategies, enhancing community resilience. In contrast, Stanly County's lower owner-occupied rate (64.5 percent) and median home value ($214,300) indicate a more vulnerable population.
- Financial Resilience and Vulnerability – The regional differences in median home values highlight disparities in financial resilience. Cabarrus and Union Counties have higher median values ($318,600 and $374,400, respectively), which can correlate with greater economic stability and capacity to recover from disasters. Stanly County's lower home values may hinder its residents' ability to bounce back from hazards, particularly for the 24.9 percent of renters who have less control over their living conditions.
- Focus on Renters – Despite the predominance of homeowners, the presence of renters (28.7 percent in Cabarrus, 24.9 percent in Stanly, and 17.8 percent in Union) points to a critical need

for inclusive hazard mitigation strategies. Renters may face unique challenges in disaster recovery, necessitating targeted resources and support to ensure they are not overlooked in planning efforts.

3.3.2 Infrastructure

Transportation

Major highways are essential to hazard mitigation and community resilience, serving as critical routes for evacuation and emergency response during disasters. They enable timely access for first responders and facilitate the movement of supplies and assistance when needed most. Additionally, these transportation networks support economic stability by allowing businesses to operate efficiently, even amid disruptions. There are several major highways that cross the Cabarrus Stanly Union Region. These highways are summarized below:

- I-85 runs from South Carolina to Virginia through North Carolina and the Cabarrus Stanly Union Region.
- US 29 and US 52 are two north-south highways connecting South Carolina with Virginia through North Carolina. The major north-south connector within the region is NC Highway 52
- I-85, US 29, and US 52 provide access to Charlotte.
- The major east-west roads include NC Highway 24/27 and NC Highway 73.
- US 74 is a major highway in the region, running east to west from Chattanooga, Tennessee to Wrightsville Beach, North Carolina and connects the region to the North Carolina Coastline.
- Other important state highways include NC 49, NC 3, NC 601, NC 8, NC 200, NC 205, and NC 740.

Collaborative efforts between the North Carolina Department of Transportation (NCDOT) and the Cabarrus Stanly Union Region to complete highway improvements and expansions are ongoing. The aim of upgrading critical highways is to support the growing needs of the community and improve safety and accessibility. These collaborative initiatives not only address current transportation demands, but also anticipate future challenges to withstand potential hazards impacts. Improved infrastructure can help prevent road failures and ensure that transportation networks remain operational even in adverse conditions. Major projects are summarized below:

- I-85 Widening – This project will add four lanes, from Exit 55 to 63, of I-85 in Cabarrus County. Interchange reconstruction and bridge replacement are included as part of the project.
- NC 73 Widening – This project involves road widening from two lanes to four lanes from Davidson-Concord Road to US 29 in Cabarrus County. Planning and design are underway.
- NC 24/27 Widening – This project will widen from two lanes to four lanes, for an 8-mile stretch, from the Pee Dee River Bridge to the Troy Bypass. Bridge Number 51 over the Pee Dee River will also be replaced.
- US 74 Widening – This project is widening the roadway for inclusion of additional express lanes and general-purpose lanes. Planning and development are underway.

Public transportation is offered throughout the Cabarrus Stanly Union Region, which promotes social equity by connecting underserved populations to essential resources, including healthcare, education, and employment. By fostering a more interconnected and resilient community, public transportation enhances the overall quality of life for residents. As the region continues to face evolving challenges, investing in and expanding public transportation systems will be vital for building a safer and more sustainable future. Public transportation in the Cabarrus Stanly Union Region is briefly summarized below:

- Cabarrus County offers public transportation through the Cabarrus County Transportation Services (CCTS) for eligible residents to access essential services in Mount Pleasant, Midland, and Harrisburg municipalities.
- Concord and Kannapolis also provide full bus service routes through CK Rider to employment areas, schools, medical facilities, shopping and entertainment destinations, and other locations.
- Union County provides public transit through the County's Human Services Transportation Division, which is a scheduled transportation service, for eligible residents, funded by grant programs or sponsorships.
- Stanly County offers community transportation services through SCUSA, utilizing vans and buses through subscription and demand routes.

The Charlotte/Douglas International Airport is the closest airport serving the Cabarrus Stanly Union Region. The airport currently offers non-stop commercial flights on nine airlines to numerous destinations across the eastern US and Midwest as well as to several international destinations. This airport is approximately 32 miles from Locust, which is roughly located in the center of the region. Other major nearby airports include the Hartsfield-Jackson Atlanta International Airport in Georgia and the Nashville Metropolitan Airport in Tennessee.

Passenger rail service is also provided in Cabarrus County, connecting the region to South Carolina, Central and Eastern North Carolina, and Virginia. Commercial rail service is provided by three major transportation companies, as well as various shortlines across the region.

Utilities

The Cabarrus, Stanly, and Union counties are interconnected not only through shared geography, but also through the essential utility services that sustain their communities. Electrical power in the region is primarily provided by Duke Energy Progress, along with contributions from Energy United and Union Energy, ensuring that residents and businesses have reliable access to electricity. Similarly, water and sewer services are managed by a combination of county authorities and local municipalities, each playing a vital role in maintaining public health and infrastructure.

Electrical power in the Cabarrus Stanly Union Region is supplied by three public utilities. Utility provider information is summarized below:

- Duke Energy Progress services Cabarrus, Stanly, and Union Counties.
- Energy United also provides service to Stanly County.

- Union Power serves Union County specifically. Pee Dee Electric serves a small area east of Marshville.
- Electric cooperatives operate within the region, with Duke Energy supplying power to the City of Kannapolis, the City of Monroe, and the Town of Oakboro.

Water and sewer services in the region are managed by various counties and towns. Water and sewer service provider information is summarized below:

- Cabarrus County supplies these essential services through the County's Water and Sewer Authority, along with additional retail sewer service providers that cater to the municipalities of Concord, Kannapolis, Harrisburg, and Mount Pleasant. The Cabarrus County Water and Sewer Authority operates the Rocky River Regional and Muddy Creek Wastewater Treatment Plants and oversees reservoir management for some or all its jurisdictions.
- Union County Water offers water and sewer services throughout the county, including fourteen municipalities. There are five wastewater treatment facilities of various sizes and one water treatment plant within Union County with additional services contracted through the City of Monroe and Charlotte Water. Union County Water partners with Lancaster Water & Sewer District on the Catawba River Water Treatment Plant in Van Wyck, SC. Underground water lines are distributed across the county and are maintained by Union County Water.
- The Albemarle Wastewater Treatment Plant and Great Badin Wastewater Treatment Plant provide services to Stanly County and its municipalities. The City of Albemarle's Public Utility Department is responsible for maintaining all easements related to the sanitary sewer outfall lines.

Additionally, there are two major interstate pipelines for refined petroleum products that run through the City of Concord, including the Plantation Pipe Line (PPL) Company and the Colonial Pipe Line. These pipelines are part of a system that originates in Louisiana and delivers over hundreds of thousands of barrels of petroleum products daily.

Critical Facilities

There is a considerable amount critical facilities located throughout the Cabarrus Stanly Union Region. According to the data collected for *Section 6: Vulnerability Assessment*, there are 110 fire/EMS stations, 29 police stations, and 240 medical care facilities within the study area. There are three hospitals located in the Cabarrus Stanly Union Region. Atrium Health has locations in all three counties, the largest of which is Atrium Health Cabarrus, a 447-bed center with an associated rehabilitation facility with 38 beds located in the City of Concord.

3.3.3 Land Use

The Cabarrus Stanly Union Region has experienced growth because of its proximity to the City of Charlotte. As shown in **Figure 3.1** above, there are several incorporated municipalities located throughout the region, and these areas are where the region's population is generally concentrated. The incorporated areas are also where many businesses, commercial uses, and institutional uses are located. Sustainability is a key element of land use guidance by focusing development to areas where physical conditions of the land can naturally support the development. Maintaining the land use challenges that

comes as communities transition from small towns to growing bedroom communities will continue to be important in the region. Section 7, Capability Assessment documents the land use regulation and management tools at use in the participating jurisdictions within the Cabarrus Stanly Union region.

3.4 EMPLOYMENT AND INDUSTRY

The Cabarrus Stanly Union Region's population is expanding, which is resulting in an increase of economic development to support the growing population. The region has a diverse economy with employment in various industries. Agriculture, business, and industry contribute to the economic growth of the region.

According to the North Carolina Department of Commerce, Labor and Economic Analysis Division, in 2023, Cabarrus County had a labor force of 118,475 (not seasonally adjusted) with the top five employers including Charlotte Mecklenburg Hospital Authority, Cabarrus County Schools, Amazoncom Services Inc., Wal-Mart Associates Inc., and Cabarrus County. The average annual unemployment was 3.2.

As of 2023 Stanly County had a labor force of 32,089 and the top five employers in Stanly County were ESS Southeast LLC., Stanly County Schools, Charlotte Mecklenburg Hospital Authority, Fiber Composites LLC., and Wal-Mart Associates Inc. The average annual unemployment rate was 3.0.

And as of 2023, Union County had a labor force of 132,893 and the top five employers in Union County were Union County Schools, Tyson Farms Inc., Union County, Utility Lines Construction, and ATI Specialty Materials LLC. The average unemployment rate was 3.0.

SECTION 4
HAZARD IDENTIFICATION

This section describes how the regional planning committee identified the hazards to be included in this plan. It consists of the following five subsections:

- 4.1 Overview
- 4.2 Disaster Declarations
- 4.3 Summary of Hazard Impacts Since Previous Plan
- 4.4 Hazard Evaluation
- 4.5 Hazard Identification Results

44 CFR Requirement
44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

4.1 OVERVIEW

The Cabarrus Stanly Union Region is vulnerable to a wide range of natural and human-caused hazards that threaten life and property. Current FEMA regulations and guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. An evaluation of human-caused hazards (i.e., technological hazards, terrorism, etc.) is encouraged, though not required, for plan approval. The Cabarrus Stanly Union Region has included a comprehensive assessment of both types of hazards.

Upon a review of the full range of natural hazards suggested under FEMA planning guidance, the participating counties in the Cabarrus Stanly Union Region have identified numerous hazards that are to be addressed in its Regional Hazard Mitigation Plan. These hazards were identified through an extensive process that utilized input from the Cabarrus Stanly Union Regional Hazard Mitigation Planning Committee members, research of past disaster declarations in the participating counties[1], and review of the North Carolina State Hazard Mitigation Plan (2023). To maintain consistency, the Cabarrus Stanly Union Planning Committee agreed to assess the same hazards that were identified in the most recent update of the North Carolina State Hazard Mitigation Plan. A list of all previous hazards covered in the 2020 Cabarrus Stanly Union Regional Hazard Mitigation Plan is viewable in **Table 4.1**, along with a summary of the hazards assessed in this update. Readily available information from reputable sources (such as federal and state agencies) was also evaluated to supplement information from these key sources.

[1] A complete list of disaster declarations for the Cabarrus Stanly Union Region can be found below in Section 4.2.

TABLE 4.1: 2025 CABARRUS STANLY UNION HAZARDS UPDATE

2020 Cabarrus Stanly Union Identified Hazards		2025 Cabarrus Stanly Union Identified Hazards		Subhazards covered in 2025 Plan
Natural Hazards	Drought	Drought	**Natural Hazards**	Agricultural Drought, Hydrological Drought
	Excessive Heat	Excessive Heat		
	Hurricane and Coastal Hazards	Hurricane and Coastal Hazards		Storm Surge associated with Hurricanes and Nor'easters, High Wind associated with Hurricanes and Nor'easters, Torrential Rain, Tornadoes associated with Hurricanes, Severe Winter Weather associated with Nor'easters
	Tornadoes/Thunderstorms	Tornadoes/Thunderstorms		Hailstorm, Torrential Rain associated with Severe Thunderstorms, Thunderstorm Wind, Lightning, Waterspout, High Wind
	Severe Winter Weather	Severe Winter Weather		Freezing Rain, Snowstorms, Blizzards, Wind Chill, Extreme Cold
	Dam Failures	Dam Failures		
	Flooding	Flooding		
	Earthquakes	Earthquakes		
	Geological	Geological		Landslides, Sinkholes, Erosion
Other Hazards	Wildfires	Wildfires		
	Infectious Disease	Infectious Disease		Vector-Borne Disease, Foreign Animal Disease
Technological Hazards	Hazardous Substances	Hazardous Substances	**Technological Hazards**	Hazardous Materials, Hazardous Chemicals, Oil Spill, Road/Rail Incidents
	Radiological Emergency-Fixed Nuclear Facilities	Radiological Emergency – Fixed Nuclear Facilities		
	Terrorism	Terrorism		Chemical, Biological, Radiological, Nuclear, Explosive
	Cyber	Cyber		Mass power/utility disruption
	Electromagnetic Pulse	Electromagnetic Pulse		
		Civil Disturbance		
		Food Emergency		

Table 4.2 lists the official disaster declarations in the Cabarrus Stanly Union Region.

Next, **Table 4.3** lists a summary of hazard impacts since the approval date of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan.

Table 4.4 documents the evaluation process used for determining which of the initially identified hazards are considered significant enough to warrant further evaluation in the risk assessment. For each hazard considered, the table indicates whether the hazard was identified as a significant hazard to be

further assessed, how this determination was made, and why this determination was made. The table works to summarize not only those hazards that *were* identified (and why) but also those that *were not* identified (and why not). Hazard events not identified for inclusion at this time may be addressed during future evaluations and updates of the risk assessment if deemed necessary by the Regional Hazard Mitigation Planning Committee during the plan update process.

Lastly, **Table 4.5** provides a summary of the hazard identification and evaluation process noting which of the initially identified hazards are considered significant enough for further evaluation through this Plan's risk assessment (marked with a "☑").

4.2 DISASTER DECLARATIONS

Disaster declarations provide initial insight into the hazards that may impact the Cabarrus Stanly Union Regional planning area. Since 1973, twelve presidential disaster declarations have been reported in the Cabarrus Stanly Union Region by FEMA, which can be seen in **Table 4.2** below. This includes six storms related to hurricanes and coastal hazards, three storms related to severe winter weather, one storm related to tornadoes, one severe storm that included major flooding, and an infectious disease pandemic (COVID-19).

TABLE 4.2: CABARRUS STANLY UNION REGION DISASTER DECLARATIONS

Year	Disaster Number	Description	Cabarrus County	Stanly County	Union County
1989	827	Tornadoes			X
1989	844	Hurricane Hugo	X	X	X
1996	1087	Blizzard of 96	X	X	X
1996	1134	Hurricane Fran		X	
1999	1292	Hurricane Floyd		X	X
2000	1312	Severe Winter Storm	X	X	X
2002	1448	Severe Ice Storm	X	X	X
2004	1546	Tropical Storm Frances	X		X
2018	4393	Hurricane Florence			X
2020	4487	COVID-19 Pandemic	X	X	X
2020	4543	Severe Storms, Tornadoes, and Flooding		X	
2024	4827	Tropical Storm Helene	X	X	X

4.3 SUMMARY OF HAZARD IMPACTS SINCE PREVIOUS PLAN

Since the approval date of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan (6/16/2020 to 12/31/2023), there have been 100 hazard events recorded for the region in the National Centers for Environmental Information (NCEI) Storm Events Database. It is important to take note of those hazard events and consider them in the *Hazard Identification* section to help ensure that the appropriate hazards are being considered in the risk assessment sections and in the Mitigation Strategy. **Table 4.3** documents the hazard events recorded and may be underreported by regional jurisdictions. Details for some of these events are discussed in further detail in the *Hazard Profiles* section.

TABLE 4.3: SUMMARY OF HAZARD EVENTS SINCE PREVIOUS PLAN

Hazard Type*	Number of Reported Events in Cabarrus County	Number of Reported Events in Stanly County	Number of Reported Events in Union County
Cold/Wind Chill	1	0	0
Flash Flood	2	8	3
Flood	2	0	0
Hail	9	1	5
Heavy Snow	0	0	0
Heavy Rain	0	0	0
High Wind	0	0	0
Lightning	0	0	0
Strong Wind	0	1	0
Thunderstorm Wind	21	15	15
Tornado	1	2	0
Tropical Storm	2	1	2
Winter Storm	1	1	1
Winter Weather	2	3	1
TOTAL NUMBER OF REPORTED EVENTS	41	32	27

* The hazard type names that NCEI uses are different than the names of hazards used in this plan; however, one can still get an understanding of the types of hazards that impact the region as the hazard types are similar in name. Source: NCEI Storm Events Database

Appendix H includes detailed information about all previous historical hazard occurrence events that have occurred in the region as reported to the National Centers for Environmental Information. Additional detailed information about previous historical hazard events can be found in *Section 5: Hazard Profiles* under each separate hazard profile.

4.4 HAZARD EVALUATION

Table 4.4 documents the evaluation process used for determining which of the initially identified hazards are considered significant to warrant listing and evaluation in the risk assessment. For each hazard considered, the table indicates whether the hazard was identified as a significant listed hazard, how this determination was made, and why this determination was made. The table works to summarize not only those hazards that *were* identified (and why) but also those that *were not* identified (and why not). Hazards not identified for inclusion at this time may be listed during future evaluations and updates of the risk assessment if deemed necessary by the planning committee during the plan update process.

TABLE 4.4: DOCUMENTATION OF THE HAZARD EVALUATION PROCESS

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
NATURAL HAZARDS			
Avalanche	**NO**	• Review of FEMA's National Risk Index • Review of the NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of US Forest Service National Avalanche Center website	• The United States avalanche hazard is limited to mountainous western states including Alaska as well as some areas of low risk in New England. • Avalanche hazards are not discussed in the North Carolina State Hazard Mitigation Plan. • Avalanche is not included in the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan.
Drought	**YES**	• Review of the NC State Hazard Mitigation Plan • Review of FEMA's National Risk Index • Review of the North Carolina Drought Monitor website • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• There are reports of drought conditions in 23 out of the last 24 years (2000-2024) in the Cabarrus Stanly Union Region, according to the North Carolina Drought Monitor. • Droughts are discussed in the NC State Hazard Mitigation Plan. • Drought is included in the previous Cabarrus Stanly Union plan.
Hailstorm	**YES (Assessed under Tornadoes/Thunderstorms)**	• Review of NC State Hazard Mitigation Plan • Review of FEMA's	• Hailstorm events are discussed in the State Plan under the Tornadoes/

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
		National Risk Index • Review of NOAA NCEI Storm Events Database • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	Thunderstorms hazard. • NCEI reports 309 hailstorm events (0.75-inch size hail to 4.5 inches) for the Cabarrus Stanly Union Region between 1959 and 2023. For these events there was over $334,000 (2023 dollars) in property damages. • Although hail is not addressed as an individual hazard in the previous Cabarrus Stanly Union plan, it is addressed under Tornadoes/ Thunderstorms. Given the frequency of the event, individual analysis is warranted.
Excessive Heat	**YES**	• Review of NOAA NCEI Storm Events Database • Review of the NC State Hazard Mitigation Plan • Review of FEMA's National Risk Index • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• NCEI reports at least two excessive heat events, and five heat events, for the Cabarrus Stanly Union counties. • Excessive heat is discussed in the State Plan. • Temperatures have reached as high as 109 degrees Fahrenheit at several points in the region. • Extreme or excessive heat was addressed in the previous Cabarrus Stanly Union plan.

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Hurricane and Coastal Hazards	**YES**	• Review of NC State Hazard Mitigation Plan • Analysis of NOAA historical tropical cyclone tracks and National Hurricane Center Website • Review of FEMA's National Risk Index • Review of NOAA NCEI Storm Events Database • Review of historical presidential disaster declarations • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• Hurricane and coastal hazard events are discussed in the State Plan. • NOAA historical records indicate roughly 85 hurricane/coastal hazards have come within 75 miles of the Cabarrus Stanly Union Region since 1850. • Six out of twelve disaster declarations in the Cabarrus Stanly Union Region are directly related to hurricane and coastal hazard events. • The 50-year return period peak gust for hurricane and tropical storm events in the Cabarrus Stanly Union Region is between 63-68 mph. • Hurricane and coastal hazards were addressed in the previous Cabarrus Stanly Union plan.
Lightning	**YES (Assessed under Tornadoes/Thunderstorms)**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database, NOAA lightning statistics • Review of the previous Cabarrus	• Lightning events are discussed in the State Plan as part of the Tornadoes/ Thunderstorms hazard. • NCEI reports 31 lightning events for the Cabarrus Stanly Union Region since 1996. These events have resulted in a

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
		Stanly Union Regional Hazard Mitigation Plan	recorded 8 injuries and nearly $3.1 million (2023 dollars) in property damage. • Lightning is addressed under Tornadoes/ Thunderstorms in the previous Cabarrus Stanly Union plan. Given the damage and reported deaths and injuries, individual analysis is warranted.
Nor'easter	**NO**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database	• Nor'easters are discussed in the State Plan under Severe Winter Weather. • NCEI does not report any nor'easter activity for the Cabarrus Stanly Union Region. However, nor'easters may have affected the region as severe winter storms. In this case, the activity would be reported under winter storm events. • Nor'easters were not addressed in the previous Cabarrus Stanly Union plan.
Tornadoes/Thunderstorm	**YES**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union	• Tornado events are discussed in the State Plan. • NCEI reports 51 tornado events in Cabarrus Stanly Union Region counties since 1989. These events have resulted

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
		Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database • Review of historical presidential disaster declarations.	in 1 recorded death and have caused 30 injuries and over $108 million (2023 dollars) in property damage with the most severe being an F4. • Tornado events were addressed in the previous Cabarrus Stanly Union plan.
Severe Thunderstorm	**YES (Assessed under Tornadoes/Thunderstorms)**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database • Review of historical presidential disaster declarations.	• Severe thunderstorm events are discussed in the State Plan. • NCEI reports 653 thunderstorm wind events in the Cabarrus Stanly Union Region counties since 1957. These events have resulted in 4 injuries and $7.36 million (2023 dollars) in property damage. • Severe thunderstorm events were addressed in the previous Cabarrus Stanly Union plan.
Severe Winter Weather	**YES**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database	• Severe winter weather events, including snow storms and ice storms, are discussed in the State Plan. • NCEI reports that the Cabarrus Stanly Union counties have been affected by 176 winter weather events since 1993. These events resulted in over $39.9 million

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
		• Review of historical presidential disaster declarations.	(2023 dollars) in damages. • Three of the region's twelve disaster declarations were directly related to winter storm events. • Winter storm events were addressed in the previous Cabarrus Stanly Union plan.
Earthquakes	**YES**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of NOAA NCEI records • USGS Earthquake Hazards Program website	• Earthquake events are discussed in the State Plan and all of the participating counties in the Cabarrus Stanly Union Region are considered to be at moderate risk of an earthquake event (no counties are high risk). • Earthquakes were addressed in the previous Cabarrus Stanly Union plan. • Earthquakes have occurred in and around the State of North Carolina in the past. The state is affected by the Charleston and the New Madrid (near Tennessee) Fault lines which have generated a magnitude 8.0 earthquake in the last 200 years. • 16 events are known to have occurred in the region according to NCEI and

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
			USGS records. The greatest MMI reported was a 7. • According to USGS seismic hazard maps, the peak ground acceleration (PGA) with a 10% probability of exceedance in 50 years for the Cabarrus Stanly Union Region is approximately 4%g. FEMA recommends that earthquakes be further evaluated for mitigation purposes in areas with a PGA of 3%g or more.
Expansive Soils	**NO**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of USDA Soil Conservation Service's Soil Survey	• Expansive soils are not discussed in the State Plan. • According to FEMA and USDA sources, the Cabarrus Stanly Union Region is located in an area that has a "little to no" clay swelling potential. • The previous Cabarrus Stanly Union plan did not address expansive soils as a potential hazard.
Geological (Landslides, Sinkholes, Erosion)	**YES**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus	• Landslide/rock fall events are discussed in the State Plan as a geological hazard. • USGS landslide hazard maps indicate "high landslide incidence" (more than

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
		Stanly Union Regional Hazard Mitigation Plan • Review of USGS Landslide Incidence and Susceptibility Hazard Map • Review of the North Carolina Geological Survey database of historic landslides	15% of the area is involved in landsliding) is found in two of the three counties. All counties also have areas of moderate susceptibility. • Data provided by NCGS indicate few recorded landslides in the Cabarrus Stanly Union Region, but the high incidence areas in Cabarrus and Stanly Counties warrant further consideration. • Geological hazards were addressed in the previous Cabarrus Stanly Union plan.
Land Subsidence	**NO**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• The State Plan does not discuss land subsidence hazards. • Land Subsidence was not addressed in the previous Cabarrus Stanly Union plan.
Tsunami	**NO**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of FEMA	• Tsunamis are not discussed as a hazard in the State Plan. • Tsunamis were not addressed in the previous Cabarrus Stanly Union plan. • No record exists of a catastrophic Atlantic basin tsunami impacting the mid-Atlantic coast of the United States.

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
		"How-to" mitigation planning guidance (Publication 386-2, "Understanding Your Risks – Identifying Hazards and Estimating Losses).	• Tsunami inundation zone maps are not available for communities located along the U.S. East Coast. • FEMA mitigation planning guidance suggests that locations along the U.S. East Coast have a relatively low tsunami risk and need not conduct a tsunami risk assessment at this time.
Volcano	**NO**	• Review of FEMA's National Risk Index • Review of NC State Hazard Mitigation Plan • Review of USGS Volcano Hazards Program website	• There are no active volcanoes in North Carolina. • There has not been a volcanic eruption in North Carolina in over 1 million years. • No volcanoes are located near the Cabarrus Stanly Union Region.
Dam Failure	**YES**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of North Carolina Dam Safety Program's NC Dam Inventory as of July 2024	• Dam failure is discussed in the State Plan. • Per the NC Dam Inventory, there are 82 high hazard dams in the planning region. (High hazard is defined as "where failure will likely cause loss of life or serious damage to homes, industrial and commercial buildings, important public utilities, primary

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
			highways, or major railroads.") • Dam failure was addressed in the previous Cabarrus Stanly Union plan.
Erosion	**YES (Referenced in Geological Hazards)**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• Riverine erosion was addressed in the previous Cabarrus Stanly Union plan. • Coastal erosion is discussed in the State Plan but only for coastal areas (there is no discussion of riverine erosion).
Flooding	**YES**	• Review of NC State Hazard Mitigation Plan • Review of FEMA's National Risk Index • Review of historical disaster declarations • Review of NOAA NCEI Storm Events Database • Review of FEMA's NFIP Community Status Book and Community Rating System (CRS) • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• The flood hazard is thoroughly discussed in the State Plan. • One of the twelve Presidential Disaster Declarations directly addresses flooding events, in addition to four hurricane/tropical storm events that caused severe flooding. • NCEI reports that Cabarrus Stanly Union Region counties have been affected by 242 flood events since 1993. These events in total caused 9 reported deaths and an estimated $24.1 million (2023 dollars) in property damages. • Nearly 6.8% of the Cabarrus Stanly Union Region is located in an

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
			identified floodplain (100 or 500-year). • All counties participate in the NFIP. • Flooding was addressed in the previous Cabarrus Stanly Union plan.
Storm Surge	**NO**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of NOAA NCEI Storm Events Database	• Storm surge is discussed in the State Plan under the Hurricane hazard. • Storm surge was not addressed in the previous Cabarrus Stanly Union plan. • No historical events were reported by NCEI. • Given the inland location of the Cabarrus Stanly Union Region, storm surge would not affect the area.
Wildfires	**YES**	• Review of NC State Hazard Mitigation Plan • Review of FEMA's National Risk Index • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of Southern Wildfire Risk Assessment (SWRA) Data • Review of the NC Forest Service website	• Wildfires were identified as a hazard in the State Plan. • Wildfires were addressed in the previous Cabarrus Stanly Union plan. • Wildfire hazard risks will increase as low-density development along the urban/wildland interface increases.

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Infectious Disease	**YES**	• Review of the NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• Including infectious disease to be consistent with the State Plan. • This hazard will assess foreign animal disease.
TECHNOLOGICAL HAZARDS			
Hazardous Substances	**YES**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• The previous Cabarrus Stanly Union plan addressed hazardous substances. • This update assesses hazardous materials, hazardous chemicals, and oil spills under this hazard.
Terrorism	**YES**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of local official knowledge	• Including terrorism hazards to be consistent with the State Plan. • There are several fixed nuclear facilities in the state. • This hazard will assess chemical, biological, radiological, nuclear, and explosive terrorism events.
Radiological Emergency – Fixed Nuclear Facilities	**YES**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan • Review of IAEA list of fixed nuclear	• The McGuire Nuclear Power Station is located on Lake Norman near the region. • The Catawba Nuclear Power Station is located across the state border in York, South Carolina, and

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
		power stations in the United States • Discussion with local officials about location of nuclear power stations	could impact the region. • Local officials expressed a desire to address radiological emergencies as a hazard in this plan. Union County is especially vulnerable as it is within the 50-mile Ingestion Pathway Zone (IPZ) of 5 nuclear power stations. • Nuclear events can sometimes be caused by natural hazards and deserve some attention in this plan due to some areas of the region being located in the 10-mile evacuation zone for the McGuire and Catawba Nuclear Power Stations.
Cyber	**YES**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• Changing future conditions encourage the assessment of the possibility of a cyberattack with the increase in global technology.
Electromagnetic Pulse	**YES**	• Review of NC State Hazard Mitigation Plan • Review of the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan	• Changing future conditions encourage the assessment of the possibility of an electromagnetic pulse with the increase in global technology.

Hazards Considered	Was this hazard identified as a significant hazard to be listed in the plan at this time? (Yes or No)	How was this determination made?	Why was this determination made?
Civil Disturbance	**YES**	• Review of NC State Hazard Mitigation Plan	• Changing future conditions and social systems encourage the assessment of the possibility of a civil disruption incident.
Food Emergency	**YES**	• Review of NC State Hazard Mitigation Plan	• Changing future conditions and food systems encourage the assessment of the possibility of a food emergency.

4.5 HAZARD IDENTIFICATION RESULTS

Table 4.5 provides a summary of the hazard identification and evaluation process noting which of the initially identified hazards are considered significant enough for further evaluation through this Plan's risk assessment (marked with a "☑").

TABLE 4.5: HAZARD IDENTIFICATION AND EVALUATION RESULTS

NATURAL HAZARDS	TECHNOLOGICAL HAZARDS
☐ Avalanche	☑ Hazardous Substances
☑ Drought	☑ Radiological Emergency – Fixed Nuclear Facilities
☑ Hailstorm**	☑ Terrorism
☑ Excessive Heat	☑ Cyber
☑ Hurricane and Coastal Hazards	☑ Electromagnetic Pulse
☑ Flooding	☑ Civil Disturbance
☑ Lightning**	☑ Food Emergency
☐ Nor'easter	
☑ Tornadoes/Thunderstorms	
☑ Severe Winter Weather	
☑ Earthquakes	
☑ Dam Failures	
☑ Geological	
☐ Expansive Soils	
☐ Land Subsidence	
☐ Tsunami	
☐ Volcano	
☐ Storm Surge	
☑ Erosion***	
☑ Wildfires	
☑ Infectious Disease	

☑ = Hazard considered significant enough for further evaluation in the Cabarrus Stanly Union Region hazard risk assessment.

** = Hazard is assessed as a subhazard under the Tornadoes/Thunderstorms hazard.

*** = Hazard is assessed as a subhazard under the Geological hazard.

SECTION 5
HAZARD PROFILES

This section includes detailed hazard profiles for each of the hazards identified in the previous section (*Hazard Identification*) as significant enough for further evaluation in the Cabarrus Stanly Union Regional Hazard Mitigation Plan. It contains the following subsections:

44 CFR Requirement

44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan must include information on previous occurrences of hazard events and on the probability of future hazard events.

5.1 OVERVIEW

This section includes detailed hazard profiles for each of the hazards identified in the previous section (*Hazard Identification*) as significant enough for further evaluation in the Cabarrus Stanly Union Region hazard risk assessment by creating a hazard profile. Each hazard profile includes a general description of the hazard, its location and extent, notable historical occurrences, a discussion about changing future conditions, and the probability of future occurrences. Each profile also includes specific items noted by members of the Cabarrus Stanly Union Regional Hazard Mitigation Planning Committee as it relates to unique historical or anecdotal hazard information for the counties in the Cabarrus Stanly Union Region, or a participating municipality within them.

After reviewing the list of assessed hazards from the previous update, the Cabarrus Stanly Union Regional Planning Committee agreed to amend the hazards in order to be consistent with the State of North Carolina Hazard Mitigation Plan. This required some of the hazard names to be changed and additional hazards were included in the assessment.

The following hazards were identified in the left below along with "compounding hazards" that may either act as a key driver or create secondary risks associated with the primary hazard:

HAZARD	COMPOUNDING - NATURAL											COMPOUNDING - TECHNOLOGICAL						
	Drought	Excessive Heat	Hurricane and Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Geological	Dam Failure	Flooding	Wildfires	Infectious Disease	Hazardous Substances	Radiological Emergency	Terrorism	Cyber	Electromagnetic Pulse	Civil Disturbance	Food Emergency
NATURAL HAZARDS																		
DROUGHT (6)		•			•		•		•	•								•
EXCESSIVE HEAT (7)	•			•			•		•	•	•							•
HURRICANE AND COASTAL HAZARDS (7)				•			•	•	•			•	•					•
TORNADOES/ THUNDERSTORMS (6)		•	•				•		•	•		•						
SEVERE WINTER WEATHER (6)	•			•			•		•		•							•
EARTHQUAKES (5)							•	•	•			•	•					
GEOLOGICAL (8)	•	•	•	•	•	•		•	•									
DAM FAILURE (5)			•			•	•		•					•				
FLOODING (11)	•	•	•	•	•	•	•	•			•	•						•
WILDFIRES (3)	•	•		•														
INFECTIOUS DISEASE (7)		•			•				•			•		•			•	•
TECHNOLOGICAL HAZARDS																		
HAZARDOUS SUBSTANCES (9)			•	•		•			•	•	•		•	•				•
RADIOLOGICAL EMERGENCY (7)			•			•						•		•	•	•		•
TERRORISM (7)								•			•	•	•		•	•	•	
CYBER (4)													•	•		•	•	
ELECTROMAGNETIC PULSE (4)													•	•	•		•	
CIVIL DISTURBANCE (4)											•			•	•	•		
FOOD EMERGENCY (8)	•	•	•		•				•		•	•	•					

This 2025 plan update cycle also explicitly recognizes the threat of climate change as a real concern for the Cabarrus Stanly Union Region as it relates to how it will impact the hazards that can affect the area. As the Earth's climate warms, changing global weather patterns, future development in both urban and rural areas, and changing local and global environmental conditions are anticipated based on historical trends and future projections. Recent studies demonstrate that North Carolina will experience a wide variety of negative effects due to climate change[1]. Additionally, the United States Environmental Protection Agency reports as of August 2016 that most of North Carolina has warmed by one-half to one degree (F) in the last century, and the sea level is rising about one inch every decade. Some of the impacts of climate change over the next fifty (50) years are expected to include, but potentially not be limited to, more frequent and/or more intense hazard events, increased vulnerability of the built environment to hazards, increased number of extreme heat days, increased risks of heat stroke and other heat-related illnesses, reduced crop yields, and livestock harms.

In response to this growing body of information, each hazard profile now includes a subsection titled ***Changing Future Conditions*** that discusses how the hazard, and thus how it impacts the Cabarrus Stanly Union Region, may be expected to change in the future. Where applicable, climate change is specifically addressed in those subsections.

5.2 STUDY AREA

The Cabarrus Stanly Union Region includes three counties: Cabarrus, Stanly, and Union. **Table 5.1** provides a summary table of the participating jurisdictions within each county. In addition, **Figure 5.1** provides a base map, for reference, of the Cabarrus Stanly Union Region.

[1] *2020 North Carolina Climate Science Report* (https://ncics.org/programs/nccsr/)

TABEL 5.1: PARTICIPATING JURISDICTIONS IN THE CABARRUS STANLY UNION REGIONAL HAZARD MITIGATION PLAN

Cabarrus County	
Concord	Midland
Harrisburg	Mount Pleasant
Kannapolis	Unincorporated Cabarrus County
Stanly County	
Albemarle	Norwood
Badin	Oakboro
Locust	Red Cross
Misenhiemer	Richfield
New London	Stanfield
Unincorporated Stanly County	
Union County	
Fairview	Monroe
Hemby Bridge	Stallings
Indian Trail	Unionville
Lake Park	Waxhaw
Marshville	Weddington
Marvin	Wesley Chapel
Mineral Springs	Wingate
Unincorporated Union County	

FIGURE 5.1: CABARRUS STANLY UNION REGION BASE MAP

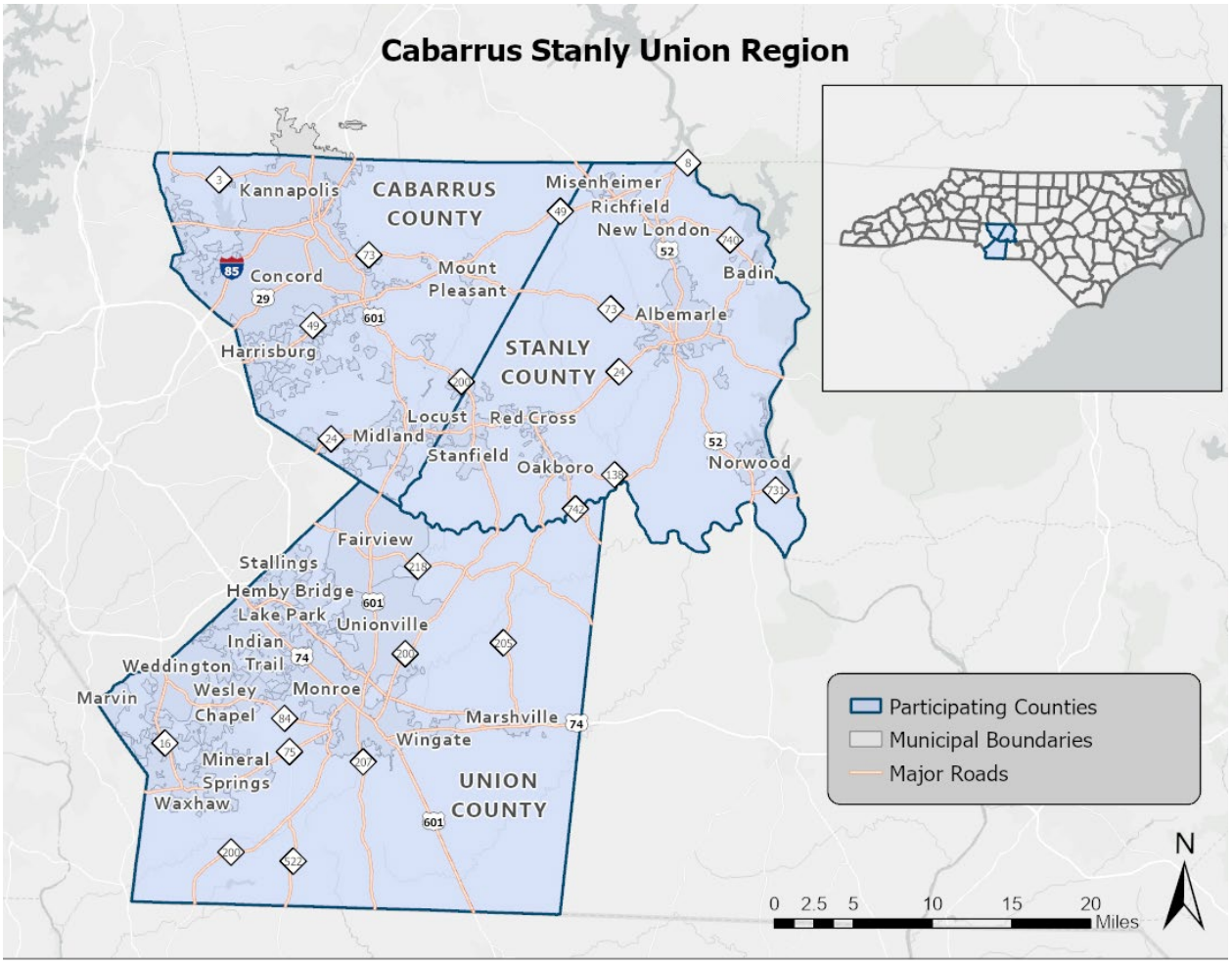


Table 5.2 lists each significant hazard for the Cabarrus Stanly Union Region and identifies whether or not it has been determined to be a specific hazard of concern for the 29 municipal jurisdictions and each of the countywide unincorporated areas. This is based on the best available data and information from the Cabarrus Stanly Union Regional Hazard Mitigation Planning Committee. (● = hazard of concern)

TABLE 5.2 SUMMARY OF IDENTIFIED HAZARDS

Jurisdiction	NATURAL											TECHNOLOGICAL						
	Drought	Excessive Heat	Hurricane and Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Geological	Dam Failure	Flooding	Wildfires	Infectious Disease	Hazardous Substances	Radiological Emergency	Terrorism	Cyber	Electromagnetic Pulse	Civil Disturbance	Food Emergency
Cabarrus County																		
Concord	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Harrisburg	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Kannapolis	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Midland	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mount Pleasant	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stanly County																		
Albemarle	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Badin	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Locust	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Misenhiemer	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
New London	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Norwood	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Oakboro	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Red Cross	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Richfield	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stanfield	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Union County																		
Fairview	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Hemby Bridge	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Indian Trail	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lake Park	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Marshville	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Marvin	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Mineral Springs	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Monroe	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Stallings	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unionville	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Waxhaw	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Weddington	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Wesley Chapel	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Wingate	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Unincorporated Area	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Natural Hazards

5.3 DROUGHT

5.3.1 Background and Description

Drought is a normal part of virtually all climatic regions, including areas with high and low average rainfall. Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. High temperatures, high winds, and low humidity can exacerbate drought conditions. In addition, human actions and demands for water resources can hasten drought-related impacts. Drought may also lead to more severe wildfires.

Droughts are typically classified into one of four types: 1) meteorological, 2) hydrologic, 3) agricultural, or 4) socioeconomic. **Table 5.3** presents definitions for these types of droughts.

TABLE 5.3 DROUGHT CLASSIFICATION DEFINITIONS

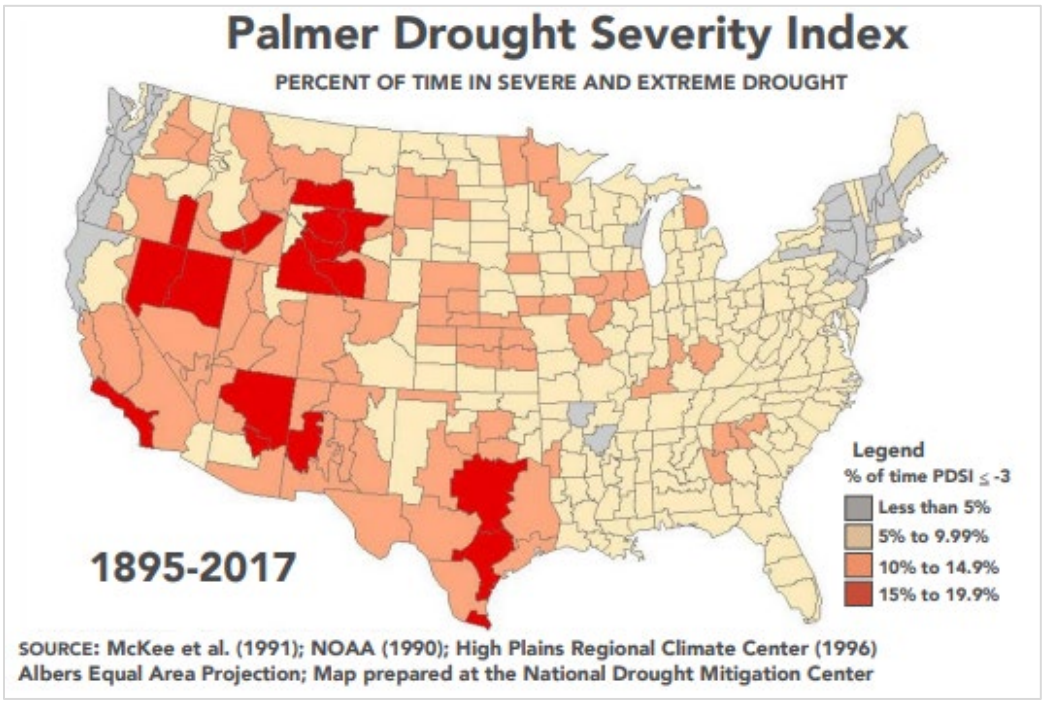
Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

Droughts are slow-onset hazards, but, over time, can have very damaging effects on crops, municipal water supplies, recreational uses, and wildlife. If drought conditions extend over a number of years, the direct and indirect economic impact can be significant.

The Palmer Drought Severity Index (PDSI) is based on observed drought conditions and range from -0.5 (incipient dry spell) to -4.0 (extreme drought). As evident in **Figure 5.2**, the Palmer Drought Severity Index Summary Map for the United States, drought affects most areas of the United States, but is less severe in the Eastern United States.

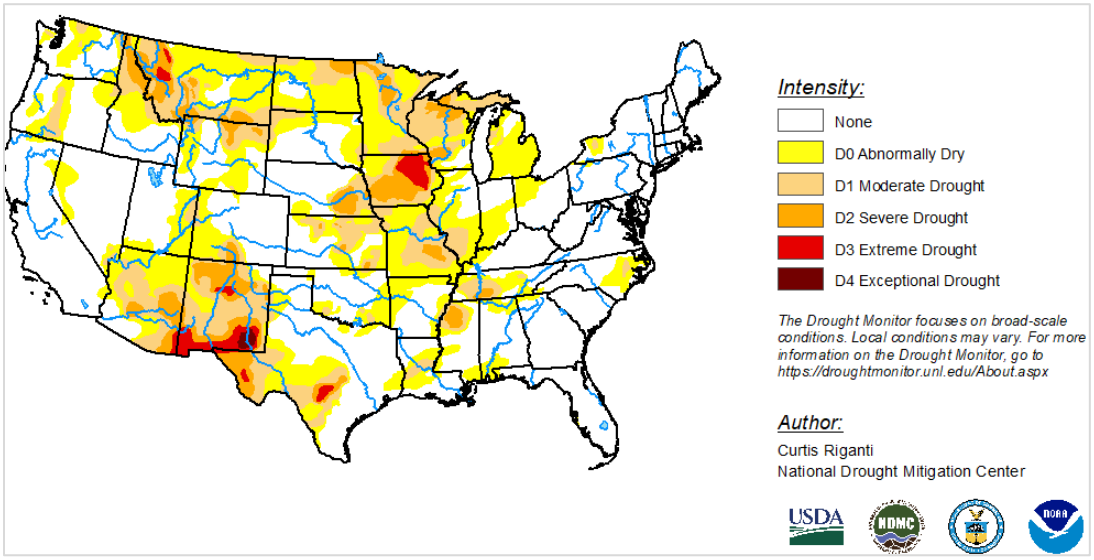
FIGURE 5.2: PALMER DROUGHT SEVERITY INDEX SUMMARY MAP



Source: National Drought Mitigation Center

The figure above is the most updated version of the Palmer Drought Severity Index; however, the US Drought Monitor is updated on a weekly basis. An archived map from March 5, 2024, can be seen below in **Figure 5.3** to reflect more current drought conditions in the US.

FIGURE 5.3: US DROUGHT MONITOR



Source: US Drought Monitor

5.3.2 Location and Spatial Extent

Drought typically covers a large area and cannot be confined to any geographic or political boundaries. According to the Palmer Drought Severity Index (**Figure 5.2**), west-central North Carolina has a relatively

low risk for drought hazard. However, local areas may experience much more severe and/or frequent drought events than what is represented on the Palmer Drought Severity Index map. Furthermore, it is assumed that the Cabarrus Stanly Union Region would be uniformly exposed to drought, making the spatial extent potentially widespread. It is also notable that drought conditions typically do not cause significant damage to the built environment.

5.3.3 Historical Occurrences

The North Carolina Drought Management Advisory Council also reports data on North Carolina drought conditions from 2000 to 2024 through the North Carolina Drought Monitor. It classifies drought conditions using the scale set by the US Drought Monitor (USDM), which classifies conditions on a scale of D0 to D4. Each class is further explained in **Table 5.4.**

TABLE 5.4: USDM DROUGHT CLASSIFICATIONS

Scale	Description	Impacts
D0	Abnormally Dry	- Short-term dryness slowing planting, growth of crops - Some lingering water deficits - Pastures or crops not fully recovered
D1	Moderate Drought	- Some damage to crops, pastures - Some water shortages developing - Voluntary water-use restrictions requested
D2	Severe Drought	- Crop or pasture loss likely - Water shortages common - Water restrictions imposed
D3	Extreme Drought	- Major crop/pasture losses - Widespread water shortages or restrictions
D4	Exceptional Drought	- Exceptional and widespread crop/pasture losses - Shortages of water creating water emergencies

According to the North Carolina Drought Monitor, all of the counties in the Cabarrus Stanly Union Region have had drought occurrences in 24 of the last 25 years (2000-2024) (**Table 5.5**). It should be noted that the North Carolina Drought Monitor also estimates what percentage of the county is in each classification of drought severity. For example, the most severe classification reported may be exceptional, but a majority of the county may actually be in a less severe condition.

TABLE 5.5: SUMMARY OF DROUGHT OCCURRENCES

Location	Years with Drought Occurrences	Years with Exceptional Drought Occurrences
Cabarrus County	24	3
Stanly County	24	3
Union County	24	3

Source: North Carolina Drought Monitor (through February 2024)

5.3.4 Changing Future Conditions

According to findings from the 2020 North Carolina Climate Science Report, it is very likely that average temperatures and the number of very warm nights will both continue to increase throughout North Carolina. Annual average temperatures have been consistently above normal in the state since the 1990s, with the most recent 10-year span (2009-2018) marking the warmest 10-year period on its record.

Additionally, by 2050, climate models project that the annual average temperature in North Carolina (compared to the 1996-2015 average temperature) will increase by 2 to 4°F under a lower emissions scenario and by 2 to 5°F under a higher emissions scenario. The frequency, duration, and intensity of droughts are likely to continue to increase in tandem with higher average temperatures and a higher rate of evapotranspiration.

5.3.5 Probability of Future Occurrences

Based on historical occurrence information, it is assumed that all of the Cabarrus Stanly Union Region has a probability level of likely (10 to 100 percent annual probability) for future drought events. This hazard may vary slightly by location, but each area has an equal probability of experiencing a drought. However, historical information also indicates that there is a much lower probability of extreme, long-lasting drought conditions. As of 2024, the FEMA National Risk Index[2] rates the drought hazard as "very low" in Cabarrus County and Stanly County compared to "relatively low" in Union County.

[2] FEMA National Risk Index (https://hazards.fema.gov/nri/)

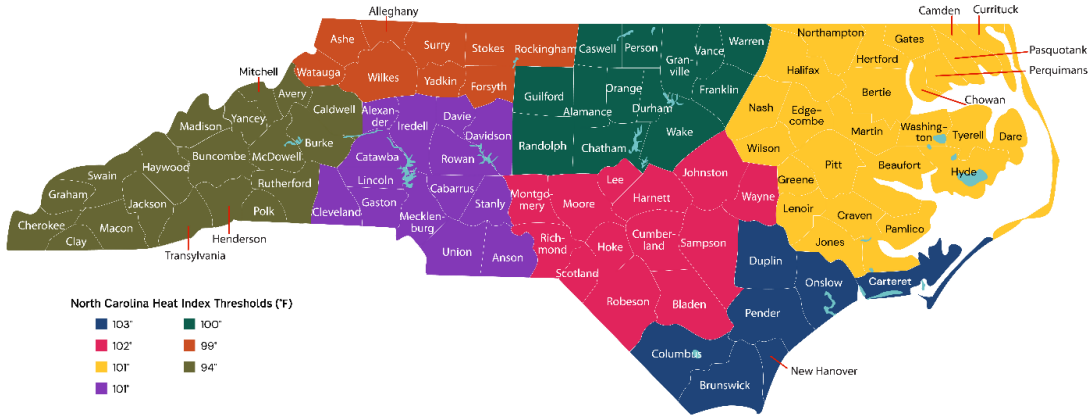
5.4 EXCESSIVE HEAT

5.4.1 Background and Description

Excessive heat, like drought, poses little risk to property. However, excessive heat can have devastating effects on health. Excessive heat is often referred to as "extreme heat" or a "heat wave." According to the National Oceanic and Atmospheric Administration, there is no universal definition for extreme heat because "the definition of "extreme" can vary depending on the location and typical climate[3]." In most areas of the country, the National Weather Service generally issues alerts "when the heat index is expected to exceed 105°F-110°F for at least two consecutive days," but they also work with local partners to determine the most appropriate conditions for a specific geography[4, 5]. Each National Weather Service forecast office considers their own community's vulnerabilities, local guidelines and thresholds, forecast confidence, heat intensity and duration, occurrences during summer holidays or outdoor events, and other factors. They use this information to decide when and whether to issue a heat watch, warning, or advisory.

The State of North Carolina defines extreme heat regionally using heat index thresholds, as shown in **Figure 5.4**. The regional thresholds recognize that an area's typical climate conditions and relevant local factors, such as the proportion of the population engaged in outdoor work, can impact how heat affects the local population. At heat indices higher than established thresholds, negative health impacts begin to occur. The North Carolina Department of Health and Human Services (NCDHHS) uses these regional temperature thresholds to activate its Heat Health Alert System. NCDHHS sends heat alerts to county health departments and Heat Health Alert System subscribers when the daily maximum heat index is forecasted to meet or exceed the heat index threshold for their region. In the Cabarrus Stanly Union Region, that threshold is 101°F.

FIGURE 5.4: NORTH CAROLINA REGIONAL HEAT INDEX THRESHOLDS



Source: North Carolina State Climate Office

[3] 2024-2030 National Heat Strategy (https://cpo.noaa.gov/wp-content/uploads/2024/07/National_Heat_Strategy-2024-2030.pdf)

[4] NWS Heat Forecast Tools (https://www.weather.gov/safety/heat-index)

[5] NWS Heat Safety (https://www.weather.gov/safety/heat-ww)

Extreme heat can lead to heat-related illness and death. The number of extreme heat days has been increasing on average each year, putting residents at a higher risk of health impacts. In 2023, more people in the United States died of heat-related illness than any other year on record[6]. **Table 5.6** shows the dangers associated with different heat index temperatures. Some populations, such as the elderly the young, and people with pre-existing health conditions, are more susceptible to heat danger than other segments of the population. However, everyone is at risk of health impacts from exposure to extreme heat.

TABLE 5.6: HEAT DISORDERS ASSOCIATED WITH HEAT INDEX TEMPERATURE

Heat Index Temperature (Fahrenheit)	Description of Risks
80°- 90°	Fatigue possible with prolonged exposure and/or physical activity
90°- 105°	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105°- 130°	Sunstroke, heat cramps, and heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
130° or higher	Heatstroke or sunstroke is highly likely with continued exposure

Source: National Weather Service, NOAA

In addition to the direct impact excessive heat has on health, heat waves can cause air pollution levels to spike. Stagnant atmospheric conditions trap pollutants. Heat accelerates the production of ground-level ozone. Excessive heat can lead to droughts, which subsequently increases wildfire risk. These compounding impacts can add unhealthy air to excessively hot temperatures. In addition, the urban heat island effect, which occurs anywhere with development – not just in large urban areas, can produce significantly higher nighttime temperatures because asphalt and concrete (which store heat longer) gradually release heat at night.

5.4.2 Location and Spatial Extent

Excessive heat typically impacts a large area and cannot be confined to any geographic or political boundaries. The entire Cabarrus Stanly Union Region is susceptible to extreme heat conditions.

5.4.3 Historical Occurrences

Data from the National Centers for Environmental Information (NCEI) was used to determine historical excessive heat and heat wave events in the Cabarrus Stanly Union Region. The results are reported in **Table 5.7** below.

[6] Associated Press Climate (https://apnews.com/article/record-heat-deadly-climate-change-humidity-south-11de21a526e1cbe7e306c47c2f12438d)

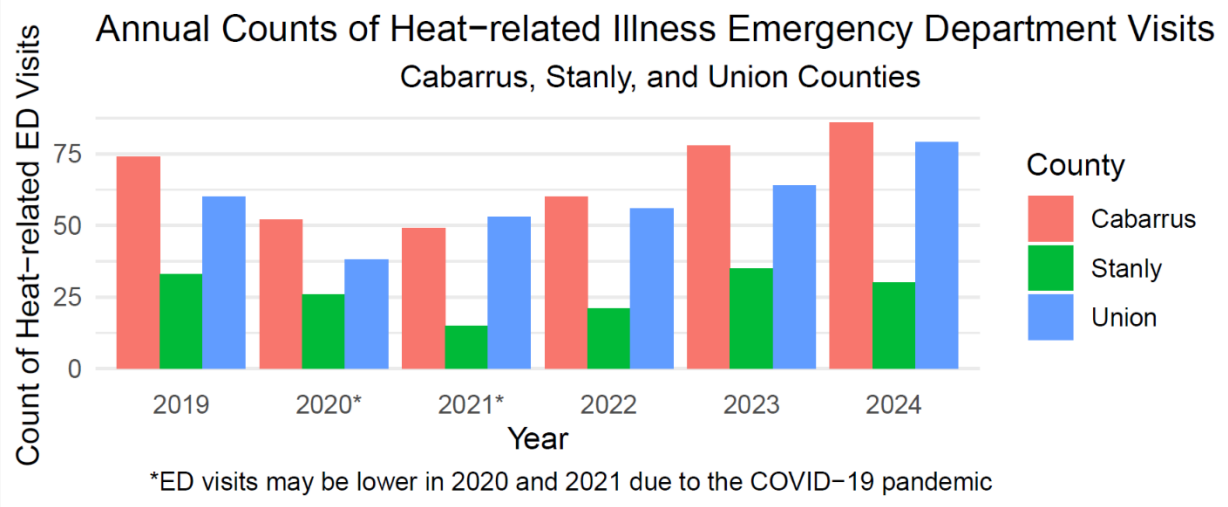
TABLE 5.7: EXCESSIVE HEAT OCCURRENCES

County	Number of Events	Deaths/Injuries	Property Damage (2023 dollars)[7]
Cabarrus County	3	0/0	$0
Stanly County	1	0/0	$0
Union County	3	0/0	$0
Cabarrus Stanly Union Regional Total	**7**	**0/0**	**$0**

Source: NOAA NCEI

Although there were no deaths or property damage reported in Table 5.7, residents experienced heat-related illnesses. **Figure 5.5** shows the annual count of emergency department visits for heat-related illness in the Cabarrus Stanly Union Region, using public health syndromic surveillance system data from the North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT). The annual count of emergency department visits for heat-related illness in Cabarrus County ranged from 49 visits in 2021 to 86 visits in 2024. The annual count of emergency department visits for heat-related illness in Stanly County ranged from 15 in 2021 to 35 in 2023. The annual count of emergency department visits for heat-related illness in Union County ranged from 38 in 2020 to 79 in 2024.

FIGURE 5.5: HEAT-RELATED ILLNESS



In addition, information from the State Climate Office of North Carolina was reviewed to obtain historical temperatures in the region. Temperature information was reported since 1890. The recorded maximum for each county can be found below in **Table 5.8**.

TABLE 5.8: HIGHEST RECORDED TEMPERATURE

Location	Date	Temperature (°F)
Cabarrus County	8/22/1983	107
Stanly County	7/28/1940	109
Union County	8/21/1983	107
Cabarrus Stanly Union Regional Maximum	--	109

[7] **Note for all NCEI property damage calculations**: these are adjusted for inflation using the Consumer Price Index (CPI) based on December 2023 dollar values to align with NCEI reporting and do not include estimates of crop damages.

Source: State Climate Office of North Carolina

The State Climate Office also reports average maximum temperatures in various locations in the region. The most centralized location is in Concord (Cabarrus County). **Table 5.9** shows the average maximum temperatures from 1892 to 2023 at the Concord observation station which can be used as a general comparison for the region.

TABLE 5.9: AVERAGE MAXIMUM TEMPERATURE IN CONCORD, CABARRUS COUNTY

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Max (°F)	70.4	73.5	81.3	88.2	92.2	96.8	98.4	97.3	94.1	87.1	79.0	71.2

Source: State Climate Office of North Carolina

5.4.4 Changing Future Conditions

According to 2022 climate summary data from the NOAA National Centers for Environmental Information, temperatures recorded since the middle of the century have steadily increased and been marked above the average consistently beyond the late 1990s. Recent summer average temperatures were also logged as the warmest reported on record for the last 16 years (2005-2020). Furthermore, the last 11 years (2010-2020) indicated the greatest number of very warm nights recorded despite no significant increase in the frequency of very hot days[8].

The State Climate Office of North Carolina provides county-specific climate projections on the North Carolina Resilience Exchange. These projections, which are based on the Fifth National Climate Assessment, anticipate that the number of days above 90°F in all three counties will increase significantly by the 2060s, as shown in **Table 5.10**. The number of days above 95°F are anticipated to increase substantially by the 2060s – as much as several times greater than the amount that Cabarrus County, Stanly County, and Union County currently experience. The same dataset shows that nighttime temperatures, which have historically surpassed 70°F for 30 nights per year in Cabarrus County, will surpass 70°F between 64 to 81 nights per year, on average. The data for nighttime temperatures projections is just as stark in Stanly and Union Counties[9].

TABLE 5.10: EXTREME HEAT PROJECTIONS IN THE CABARRUS STANLY UNION REGION

Location	Average Number of Days each Year with Daytime Temperatures Over 90°F	
	Historical Number of Days	Projected Number of Days by the 2060s
Cabarrus County	50	86-100
Stanly County	47	83-97
Union County	48	84-98
	Average Number of Days each Year with Daytime Temperatures Over 95°F	
	Historical Number of Days	Projected Number of Days by the 2060s
Cabarrus County	14	38-51
Stanly County	12	34-47

[8] NOAA NCEI 2022 State Climate Summaries (https://statesummaries.ncics.org/chapter/nc/)

[9] NC Resilience Exchange (https://www.resilienceexchange.nc.gov/understand-your-vulnerabilities/climate-observations-and-projections)

Union County	12	34-46
	Average Number of Days each Year with Nighttime Lows Over 70°F	
	Historical Number of Nights	Projected Number of Nights by the 2060s
Cabarrus County	30	64-81
Stanly County	29	64-81
Union County	33	67-83

Source: North Carolina State Climate Office

Nights that do not go below 70°F make it increasingly difficult for the human body to recover from hot days. This continuous exposure to heat can make health problems worse, especially for residents that live in homes without adequate air conditioning and other vulnerable populations.

5.4.5 Probability of Future Occurrences

Based on historical occurrence information and echoing key findings from the 2020 North Carolina Climate Science Report, it is assumed that all of the Cabarrus Stanly Union Region has a probability level of likely (10 to 100 percent annual probability) for future extreme heat events to impact the region.

5.5 HURRICANE AND COASTAL HAZARDS

5.5.1 Background and Description

Hurricanes and coastal hazards are classified as cyclones and defined as any closed circulation developing around a low-pressure center in which the winds rotate counterclockwise in the Northern Hemisphere (or clockwise in the Southern Hemisphere) and whose diameter averages 10 to 30 miles across. A tropical cyclone refers to any such circulation that develops over tropical waters. Tropical cyclones act as a "safety-valve," limiting the continued build-up of heat and energy in tropical regions by maintaining the atmospheric heat and moisture balance between the tropics and the pole-ward latitudes. The primary damaging forces associated with these storms are high-level sustained winds, heavy precipitation, and tornadoes.

The key energy source for a tropical cyclone is the release of latent heat from the condensation of warm water. Their formation requires a low-pressure disturbance, warm sea surface temperature, rotational force from the spinning of the earth, and the absence of wind shear in the lowest 50,000 feet of the atmosphere. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season, which encompasses the months of June through November. The peak of the Atlantic hurricane season is in early to mid-September and the average number of storms that reach hurricane intensity per year in the Atlantic basin is about six.

As an incipient hurricane develops, barometric pressure (measured in millibars or inches) at its center falls and winds increase. If the atmospheric and oceanic conditions are favorable, it can intensify into a tropical depression. When maximum sustained winds reach or exceed 39 miles per hour, the system is designated a tropical storm, given a name, and is closely monitored by the National Hurricane Center in Miami, Florida. When sustained winds reach or exceed 74 miles per hour the storm is deemed a hurricane. Hurricane intensity is further classified by the Saffir-Simpson Scale (**Table 5.11**), which rates hurricane intensity on a scale of 1 to 5, with 5 being the most intense.

TABLE 5.11: SAFFIR-SIMPSON SCALE

Category	Maximum Sustained Wind Speed (MPH)	Minimum Surface Pressure (Millibars)
1	74-95	Greater than 980
2	96-110	979-965
3	111-129	964-945
4	130-156	944-920
5	157 +	Less than 920

Source: National Hurricane Center (2024)

The Saffir-Simpson Scale categorizes hurricane intensity linearly based upon maximum sustained winds and barometric pressure, which are combined to estimate potential damage. Categories 3, 4, and 5 are classified as "major" hurricanes and, while hurricanes within this range comprise only 20 percent of total tropical cyclone landfalls, they account for over 70 percent of the damage in the United States. **Table 5.12** describes the damage that could be expected for each category of hurricane. Damage during hurricanes may also result from spawned tornadoes, storm surge, and inland flooding associated with heavy rainfall that usually accompanies these storms.

TABLE 5.12: HURRICANE DAMAGE CLASSIFICATIONS

Category	Damage Level	Description of Damages	Photo Example
1	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
2	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
3	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
4	EXTREME	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Source: National Hurricane Center; Federal Emergency Management Agency

5.5.2 Location and Spatial Extent

Hurricanes, coastal hazards, and tropical storms threaten the entire Atlantic and Gulf seaboard of the United States. While coastal areas are most directly exposed to the brunt of landfalling storms, their impact is often felt hundreds of miles inland and they can affect the Cabarrus Stanly Union Region. All areas in the Cabarrus Stanly Union Region are equally susceptible to hurricanes and coastal hazards.

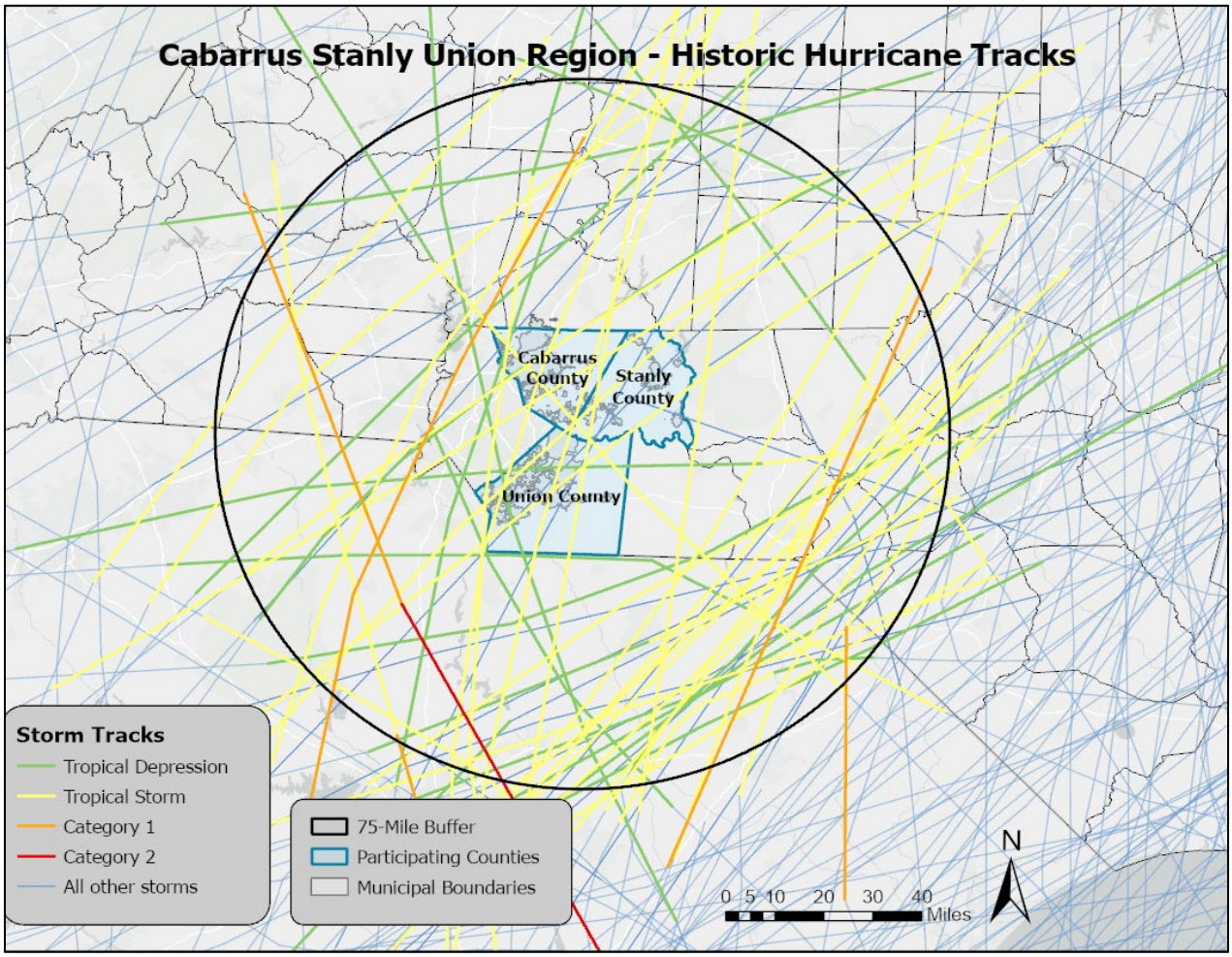
5.5.3 Historical Occurrences

According to the National Hurricane Center's historical storm track records, 69 hurricane or tropical storm tracks have passed within 75 miles of the Cabarrus Stanly Union Region since 1850[10].

Of the recorded storm events, thirteen have traversed directly through the Cabarrus Stanly Union Region as shown in **Figure 5.6**. Furthermore, **Table 5.13** provides for each event the date of occurrence, name (if applicable), maximum wind speed, and maximum category of the storm based on the Saffir-Simpson Scale (e.g., Hurricane Category 1-5 = "H1" to "H5", Tropical Storm = "TS", Tropical Depression = "TD").

[10] These storm track statistics do not include extra-tropical storms. Though these related hazard events are less severe in intensity, they may cause significant local impact in terms of rainfall and high winds.

FIGURE 5.6: HISTORICAL HURRICANE STORM TRACKS WITHIN 75 MILES



Source: National Oceanic and Atmospheric Administration; National Hurricane Center

TABLE 5.13: HISTORICAL STORM TRACKS WITHIN 75 MILES OF THE CABARRUS STANLY UNION REGION (1850–2024)

Storm Name	Formation Date	Maximum Wind Speed (knots)	Maximum Storm Category
IAN 2022	9/22/2022	140	H5
ELSA 2021	6/30/2021	75	H1
CLAUDETTE 2021	6/17/2021	40	TS
ZETA 2020	10/24/2020	100	H3
BERTHA 2020	5/27/2020	45	TS
MICHAEL 2018	10/6/2018	140	H5
FLORENCE 2018	8/30/2018	130	H4
ANDREA 2013	6/5/2013	55	TS
ALBERTO 2006	6/10/2006	60	TS
JEANNE 2004	9/13/2004	105	H3
GASTON 2004	8/27/2004	65	H1
ALLISON 2001	6/5/2001	50	TS
HELENE 2000	9/15/2000	60	TS
DENNIS 1999	8/24/1999	90	H2
DANNY 1997	7/16/1997	70	H1
FRAN 1996	8/23/1996	105	H3

Storm Name	Formation Date	Maximum Wind Speed (knots)	Maximum Storm Category
GORDON 1994	11/8/1994	75	H1
UNNAMED 1994	7/20/1994	30	TD
HUGO 1989	9/10/1989	140	H5
CHRIS 1988	8/21/1988	45	TS
DANNY 1985	8/12/1985	80	H1
BOB 1985	7/21/1985	65	H1
UNNAMED 1981	7/2/1981	30	TD
DAVID 1979	8/25/1979	150	H5
BABE 1977	9/3/1977	65	H1
UNNAMED 1976	9/13/1976	40	TS
AGNES 1972	6/14/1972	75	H1
ALMA 1970	5/17/1970	65	H1
ABBY 1968	6/1/1968	65	H1
CLEO 1964	8/20/1964	130	H4
UNNAMED 1964	7/23/1964	50	TS
GRACIE 1959	9/20/1959	115	H4
CINDY 1959	7/4/1959	65	H1
ARLENE 1959	5/28/1959	55	TS
UNNAMED 1952	8/27/1952	45	TS
ABLE 1952	8/18/1952	85	H2
UNNAMED 1949	9/11/1949	45	TS
UNNAMED 1949	8/23/1949	115	H4
UNNAMED 1946	10/5/1946	85	H2
UNNAMED 1945	9/12/1945	115	H4
UNNAMED 1935	8/29/1935	160	H5
UNNAMED 1927	9/30/1927	50	TS
UNNAMED 1920	9/19/1920	75	H1
UNNAMED 1916	7/11/1916	100	H3
UNNAMED 1915	7/31/1915	65	H1
UNNAMED 1913	10/2/1913	65	H1
UNNAMED 1913	8/30/1913	75	H1
UNNAMED 1906	9/3/1906	80	H1
UNNAMED 1904	9/8/1904	70	H1
UNNAMED 1902	6/12/1902	50	TS
UNNAMED 1901	7/4/1901	70	H1
UNNAMED 1899	10/26/1899	95	H2
UNNAMED 1896	9/22/1896	110	H3
UNNAMED 1893	9/27/1893	115	H4
UNNAMED 1893	8/15/1893	105	H3
UNNAMED 1889	9/12/1889	95	H2
UNNAMED 1888	9/6/1888	50	TS
UNNAMED 1887	10/9/1887	75	H1
UNNAMED 1886	6/27/1886	85	H2
UNNAMED 1886	6/17/1886	85	H2
UNNAMED 1885	10/10/1885	60	TS
UNNAMED 1882	9/2/1882	110	H3
UNNAMED 1878	9/1/1878	90	H2
UNNAMED 1877	9/21/1877	100	H3
UNNAMED 1867	6/21/1867	70	H1
UNNAMED 1859	9/15/1859	70	H1
UNNAMED 1856	8/25/1856	100	H3
UNNAMED 1854	9/7/1854	110	H3
UNNAMED 1852	10/6/1852	90	H2
UNNAMED 1851	8/16/1851	100	H3

Source: National Hurricane Center

The National Centers for Environmental Information reported fourteen events associated with a hurricane or tropical storm in the Cabarrus Stanly Union Region between 1950 and 2023. The storms resulted in over $1.46 million (2023 dollars) of property damage and numerous trees and power lines were reported down across the region. Federal records also indicate that six disaster declarations were made in 1989 (Hurricane Hugo), 1996 (Hurricane Fran), 1999 (Hurricane Floyd), 2004 (Tropical Storm Frances), 2018 (Hurricane Florence), and 2024 (Tropical Storm Helene) for the region[11].

Flooding is generally the greatest hazard of concern with hurricane and tropical storm events in the Cabarrus Stanly Union Region. However, winds can also be a concern in cases where a hurricane makes landfall in South Carolina, as was the case with Hurricane Hugo in 1989. Some anecdotal information is available for the major storms that have impacted that area as found below:

Hurricane Hugo – September 22-24, 1989
Hurricane Hugo was one of the largest storms on record in the Atlantic Basin that produced high winds and dumped heavy rains over much of North Carolina and South Carolina. Hugo reached a peak level of Category 5 on the Saffir-Simpson scale and made landfall near Isle of Palms in South Carolina as a Category 4, eventually passing over Charlotte and much of the surrounding area as a Category 1 storm. Although the storm caused its greatest damage in South Carolina, over 1,000 structures were destroyed or severely damaged in North Carolina, causing over $1 billion dollars in damages. Wind gusts reached over 40 mph and numerous trees were downed throughout much of south and western North Carolina.

Tropical Storm Frances – September 7-8, 2004
Tropical Storm Frances was a slow-moving, relatively large storm that dumped heavy rains over the eastern United States. The remnants of Frances produced a swath of 5 to 15 inches of rain across much of western North Carolina with reports of 12 to 15 inches of rain along the higher terrain and isolated reports in excess of 18 inches. Wind gusts reached between 40 and 60 mph in many areas and numerous trees were downed. Frances caused significant crop damages totaling $55 million statewide. North Carolina residents received almost $20.6 million in federal disaster assistance following the storm.

Tropical Storm Helene – September 26-29, 2024
Tropical Storm Helene originated in the Caribbean Sea and rapidly intensified to a major hurricane ahead of its landfall along the coast of Florida before moving farther north towards the Appalachian Mountains with an unprecedented amount of rainfall. Many areas across the Carolinas broke historic records for precipitation totals with anywhere from 10 to nearly 30 inches recorded and some estimates reported over 40 trillion cumulative gallons released throughout the course of Helene's lifetime in the Southeast. This led to multiple 1,000-year flood events in Western North Carolina where the worst impacts materialized. According to the National Centers for Environmental Information (NCEI), Helene led to roughly 219 deaths making it one of the deadliest hurricanes after Hurricane Maria (2,981) and Hurricane Katrina (1,833) in addition to approximately $78.7 billion in CPI-adjusted estimated costs[12].

[11] Not all of the participating counties were declared disaster areas for these storms. A complete listing of historical disaster declarations, including the affected counties, can be found in Section 4: *Hazard Identification*.
[12] NCEI Billion-Dollar Weather and Climate Disasters (https://www.ncei.noaa.gov/access/billions/events)

5.5.4 Changing Future Conditions

North Carolina is vulnerable to the hazards of tropical storms and hurricanes due to its location along the Atlantic Coast. This inherently creates the greatest risk near low-lying coastal areas of the state, although inland areas found to the west may still face significant impacts over time. According to 2022 climate summary data from the NOAA National Centers for Environmental Information, a storm at hurricane-level intensity makes landfall in the state roughly once every 3 years. Several periods since the late 1990s were notably active in terms of hurricane formation and local damages, including Hurricanes Dennis, Floyd, Frances, Ivan, Matthew, and Florence. Climate change models project that hurricane-associated storm intensity and rainfall rates will both increase in the future despite some annual variability in the number of landfalling hurricanes in North Carolina[13].

5.5.5 Probability of Future Occurrences

Given the inland location of the region, it is more likely to be affected by remnants of hurricane and tropical storm systems (as opposed to a major hurricane) which may result in flooding or high winds. However, as Hurricane Hugo demonstrated, the region is not immune to a major hurricane strike. The probability of being impacted is less than coastal areas but still remains a real threat to the Cabarrus Stanly Union Region due to induced events like flooding and landsliding. Based on historical evidence, the probability level of future occurrence is possible (between 1 and 10 percent annual probability). Given the regional nature of the hazard, all areas are equally exposed to this hazard. However, when the region is impacted, the damage could be catastrophic, threatening lives and property throughout the planning area. As of 2024, the FEMA National Risk Index rates the hurricane hazard as “relatively low” across Cabarrus County, Stanly County, and Union County.

[13] NOAA NCEI 2022 State Climate Summaries (https://statesummaries.ncics.org/chapter/nc/)

5.6 TORNADOES/THUNDERSTORMS

For the purposes of maintaining consistency with the State of North Carolina Hazard Mitigation Plan, this section will assess tornadoes and thunderstorms, which also include high winds, hailstorms, and lightning.

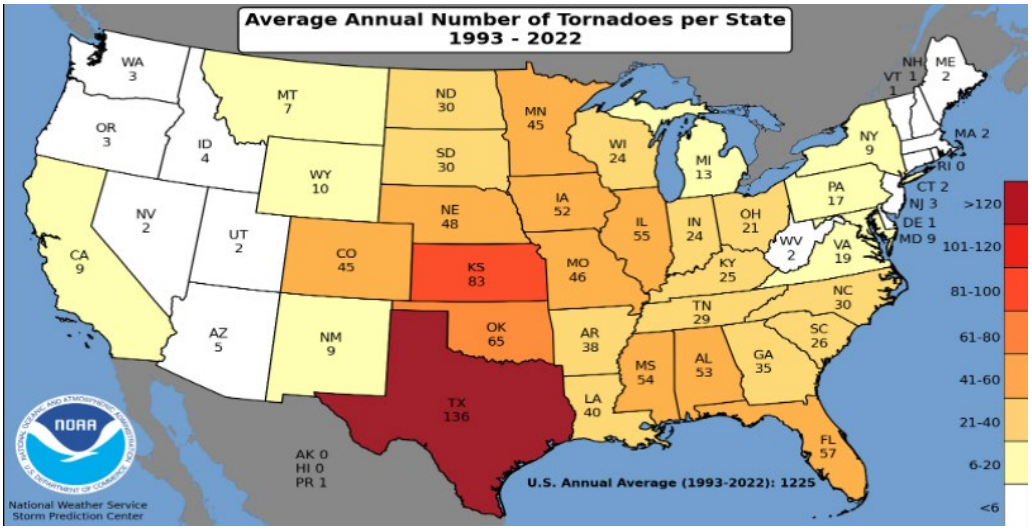
5.6.1 Background and Description

Tornadoes

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 miles per hour to more than 300 miles per hour. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Each year, an average of over 1,200 tornadoes is reported nationwide, resulting in an average of approximately 56 deaths and 1,500 injuries[14]. According to the NOAA Storm Prediction Center (SPC), the highest concentration of tornadoes in the United States has been in Oklahoma, Texas, Kansas, and Florida respectively. Although the Great Plains region of the Central United States does favor the development of the largest and most dangerous tornadoes (earning the designation of "tornado alley"), Florida experiences the greatest number of tornadoes per square mile of all U.S. states (SPC, 2002). **Figure 5.7** shows tornado activity in the United States based on the number of recorded tornadoes per 10,000 square miles.

FIGURE 5.7: TORNADO ACTIVITY IN THE UNITED STATES



Source: NOAA Storm Prediction Center

Tornadoes are more likely to occur during the months of March through May and are most likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

[14] NOAA, 2013.

The destruction caused by tornadoes ranges from light to inconceivable depending on the intensity, size, and duration of the storm. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings (particularly mobile homes). Tornadic magnitude is reported according to the Fujita and Enhanced Fujita Scales. Tornado magnitudes prior to 2005 were determined using the traditional version of the Fujita Scale (**Table 5.14**). Tornado magnitudes that were determined in 2005 and later were determined using the Enhanced Fujita Scale (**Table 5.15**).

TABLE 5.14: THE FUJITA SCALE (EFFECTIVE PRIOR TO 2005)

F-Scale Number	Intensity Phrase	Wind Speed	Type of Damage Done
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.
F6	Inconceivable tornado	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies

Source: National Weather Service

TABLE 5.15 THE ENHANCED FUJITA SCALE (EFFECTIVE 2005 AND LATER)

EF-Scale Number	Intensity Phrase	3 Second Gust (MPH)	Type of Damage Done
0	Gale	65-85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
1	Moderate	86-110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
2	Significant	111-135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
3	Severe	136-165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
4	Devastating	166-200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.

EF-Scale Number	Intensity Phrase	3 Second Gust (MPH)	Type of Damage Done
5	Incredible	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

Source: National Weather Service

Thunderstorms

Thunderstorms can produce a variety of accompanying hazards including wind, hailstorms, and lightning[15], which are all discussed here. Although thunderstorms generally affect a small area, they are very dangerous and may cause substantial property damage.

Three conditions need to occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the "engine" of the storm). Third, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun's heat. When these conditions occur simultaneously, air masses of varying temperatures meet, and a thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Furthermore, they can move through an area very quickly or linger for several hours.

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as "severe." A severe thunderstorm occurs when the storm produces at least one of these three elements: 1) hail of three-quarters of an inch, 2) a tornado, or 3) winds of at least 58 miles per hour.

Thunderstorm events have the capability of producing straight-line winds that can cause severe destruction to communities and threaten the safety of a population. Such wind events, sometimes separate from a thunderstorm event, are common throughout the Cabarrus Stanly Union Region. Therefore, high winds are also reported in this section.

High winds can form due to pressure of the Northeast coast that combines with strong pressure moving through the Ohio Valley. This creates a tight pressure gradient across the region, resulting in high winds which increase with elevation. It is common for gusts of 30 to 60 miles per hour during the winter months.

Downbursts are also possible with thunderstorm events. Such events are an excessive burst of wind in excess of 125 miles per hour. They are often confused with tornadoes. Downbursts are caused by down drafts from the base of a convective thunderstorm cloud. It occurs when rain-cooled air within the cloud becomes heavier than its surroundings. Thus, air rushes towards the ground in a destructive yet isolated manner. There are two types of downbursts. Downbursts less than 2.5 miles wide, duration less than 5 minutes, and winds up to 168 miles per hour are called "microbursts." Larger events greater than 2.5 miles at the surface and longer than 5 minutes with winds up to 130 miles per hour are referred to as "macrobursts."

Hailstorms

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air

[15] Lightning and hail hazards are discussed as separate hazards in this section.

into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop to a sufficient weight and fall as precipitation. Hail typically takes the form of spheres or irregularly-shaped masses greater than 0.75 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size. **Table 5.16** shows the TORRO Hailstorm Intensity Scale which is a way of measuring hail severity.

TABLE 5.16: TORRO HAILSTORM INTENSITY SCALE

	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m^2	mm to inch conversion (inches)	Typical Damage Impacts
H0	Hard Hail	5	0-20	0 – 0.2	No damage
H1	Potentially Damaging	5-15	>20	0.2 – 0.6	Slight general damage to plants, crops
H2	Significant	10-20	>100	0.4 – 0.8	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	>300	0.8 – 1.2	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40	>500	1.0 – 1.6	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	>800	1.2 – 2.0	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60		1.6 – 2.4	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-75		2.0 – 3.0	Severe roof damage, risk of serious injuries
H8	Destructive	60-90		1.6 – 3.5	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100		3.0 – 3.9	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100			Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organisation (TORRO)

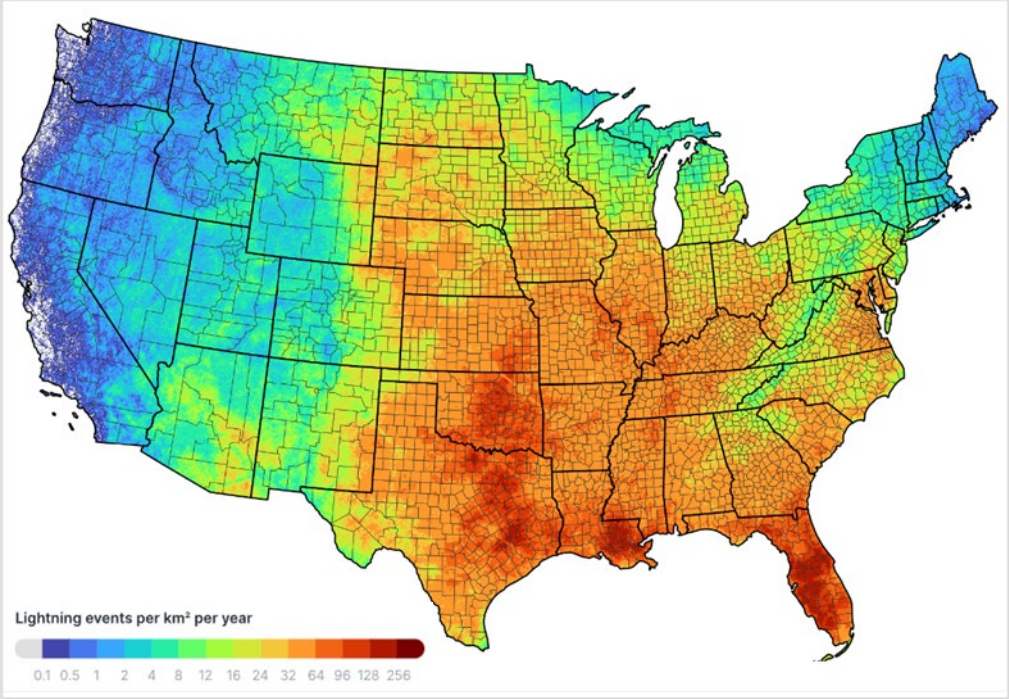
Lightning

Lightning is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm, creating a "bolt" when the buildup of charges becomes strong enough. This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000 degrees Fahrenheit. Lightning rapidly heats the sky as it flashes but the surrounding air cools following the bolt. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. While most often affiliated with severe thunderstorms, lightning may also strike outside of heavy rain and might occur as far as 10 miles away from any rainfall.

Lightning strikes occur in very small, localized areas. For example, they may strike a building, electrical transformer, or even a person. According to FEMA, lightning injures an average of 300 people and kills 80 people each year in the United States. Direct lightning strikes also have the ability to cause significant damage to buildings, critical facilities, and infrastructure largely by igniting a fire. Lightning is also responsible for igniting wildfires that can result in widespread damages to property.

Figure 5.8 shows a lightning flash density map for the years 2016-2022 based upon data provided by Vaisala's U.S. National Lightning Detection Network (NLDN).

FIGURE 5.8: LIGHTNING FLASH DENSITY IN THE UNITED STATES (2016-2022)



Source: Vaisala U.S. National Lightning Detection Network

5.6.2 Location and Spatial Extent

Tornadoes

Tornadoes occur throughout the state of North Carolina, and thus in the Cabarrus Stanly Union Region. Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict specific areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that the Cabarrus Stanly Union Region is uniformly exposed to this hazard.

Thunderstorms

A thunderstorm/wind event is an atmospheric hazard, and thus has no geographic boundaries. It is typically a widespread event that can occur in all regions of the United States. However, thunderstorms are most common in the central and southern states because atmospheric conditions in those regions are favorable for generating these powerful storms. Also, the Cabarrus Stanly Union Region typically experiences several straight-line wind events each year. These wind events can and have caused significant damage. It is assumed that the Cabarrus Stanly Union Region has uniform exposure to a

thunderstorm/wind event and the spatial extent of an impact could be large.

Hailstorms

Hailstorms frequently accompany thunderstorms, so their locations and spatial extents coincide. It is assumed that the Cabarrus Stanly Union Region is uniformly exposed to severe thunderstorms; therefore, all areas of the region are equally exposed to hail which may be produced by such storms.

Lightning

Lightning occurs randomly, therefore it is impossible to predict where and with what frequency it will strike. It is assumed that all of the Cabarrus Stanly Union Region is uniformly exposed to lightning.

5.6.3. Historical Occurrences

Tornadoes

Tornadoes are a somewhat rare occurrence, however, they have and do occur in the Cabarrus Stanly Union Region. Tornadoes resulted in two disaster declarations in the Cabarrus Stanly Union Region in 1989 and 2020[16]. According to the National Centers for Environmental Information, there have been a total of 51 recorded tornado events in the Cabarrus Stanly Union Region since 1950 (**Table 5.17**), resulting in over $108 million (2023 dollars) in property damages[17]. In addition, 1 death and 30 injuries were reported. The magnitude of these tornadoes ranges from F0 to F4 in intensity, although an F5 event is possible. It is important to note that only tornadoes that have been reported are factored into this risk assessment. It is likely that a high number of occurrences have gone unreported.

TABLE 5.17: SUMMARY OF TORNADO OCCURRENCES

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)[18]
Cabarrus County	**15**	**0/3**	**$11,249,513**
Concord	2	0/0	$7,574
Harrisburg	2	0/0	$2,016,314
Kannapolis	0	0/0	$0
Midland	0	0/0	$0
Mount Pleasant	0	0/0	$0
Unincorporated Area	11	0/3	$9,225,625
Stanly County	**15**	**0/1**	**$19,412,743**
Albemarle	1	0/0	$5,480,870
Badin	0	0/0	$0
Locust	1	0/0	$45,674
Misenhiemer	0	0/0	$0
New London	0	0/0	$0
Norwood	0	0/0	$0
Oakboro	0	0/0	$0
Red Cross	0	0/0	$0

[16] A complete listing of historical disaster declarations can be found in Section 4: *Hazard Profiles.*

[17] These tornado events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is likely that additional tornadoes have occurred in the Cabarrus Stanly Union Region. As additional local data becomes available, this hazard profile will be amended.

[18] **Note for all NCEI property damage calculations**: these are adjusted for inflation based on December 2023 dollar values to align with NCEI reporting and do not include estimates of crop damages.

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)[18]
Richfield	0	0/0	$0
Stanfield	0	0/0	$0
Unincorporated Area	13	0/1	$13,886,199
Union County	**21**	**1/26**	**$77,413,681**
Fairview	0	0/0	$0
Hemby Bridge	0	0/0	$0
Indian Trail	1	0/0	$0
Lake Park	0	0/0	$0
Marshville	0	0/0	$0
Marvin	0	0/0	$0
Mineral Springs	0	0/0	$0
Monroe	2	0/0	$420,159
Stallings	1	0/1	$100,970
Unionville	1	0/0	$0
Waxhaw	0	0/0	$0
Weddington	0	0/0	$0
Wesley Chapel	0	0/0	$0
Wingate	0	0/0	$0
Unincorporated Area	16	1/25	$76,892,552
Cabarrus Stanly Union Regional Total	**51**	**1/30**	**$108,075,937**

Source: National Centers for Environmental Information

Thunderstorms

Severe storms have resulted in one disaster declaration in the Cabarrus Stanly Union Region and several other declared disaster events such as the tornadoes of 1989 were likely accompanied by severe storms[19]. According to NCEI, there have been 673 reported thunderstorm and high wind events since 1957 in the Cabarrus Stanly Union[20]. These events caused over $8.4 million (2023 dollars) in damages. There were reports of four injuries. **Table 5.18** summarizes this information.

TABLE 5.18: SUMMARY OF THUNDERSTORM / HIGH WIND OCCURRENCES

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Cabarrus County	**226**	**0/0**	**$2,113,202**
Concord	53	0/0	$386,421
Harrisburg	23	0/0	$183,743
Kannapolis	23	0/0	$126,647
Midland	11	0/0	$93,695
Mount Pleasant	12	0/0	$60,728
Unincorporated Area	104	0/0	$1,261,968
Stanly County	**197**	**0/3**	**$3,918,306**
Albemarle	47	0/3	$3,548,850

[19] Not all of the participating counties were declared disaster areas for these events. A complete listing of historical disaster declarations, including the affected counties, can be found in Section 4: *Hazard Identification*.

[20] These thunderstorm events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is likely that additional thunderstorm events have occurred in the Cabarrus Stanly Union Region. As additional local data becomes available, this hazard profile will be amended.

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Badin	6	0/0	$28,443
Locust	8	0/0	$12,216
Misenhiemer	0	0/0	$0
New London	11	0/0	$26,151
Norwood	13	0/0	$14,436
Oakboro	10	0/0	$102,155
Red Cross	5	0/0	$47,578
Richfield	6	0/0	$2,501
Stanfield	10	0/0	$46,727
Unincorporated Area	78	0/0	$89,249
Union County	**250**	**0/1**	**$2,382,775**
Fairview	11	0/0	$2,879
Hemby Bridge	0	0/0	$0
Indian Trail	11	0/0	$66,892
Lake Park	0	0/0	$0
Marshville	16	0/0	$66,792
Marvin	2	0/0	$0
Mineral Springs	7	0/0	$26,707
Monroe	48	0/0	$498,838
Stallings	6	0/0	$1,888
Unionville	10	0/0	$423,842
Waxhaw	28	0/0	$1,152,720
Weddington	8	0/0	$30,291
Wesley Chapel	3	0/0	$0
Wingate	8	0/0	$8,349
Unincorporated Area	92	0/1	$103,577
Cabarrus Stanly Union Regional Total	**673**	**0/4**	**$8,414,283**

Source: National Centers for Environmental Information

Hailstorms

According to the National Centers for Environmental Information, 309 recorded hailstorm events have affected the Cabarrus Stanly Union Region since 1959[21]. **Table 5.19** is a summary of the hail events in the Cabarrus Stanly Union Region. In all, hail occurrences resulted in over $334,328 (2023 dollars) in property damages, most of which were reported in Stanly County. Hail ranged in diameter from 0.75 inches to 4.5 inches. It should be noted that hail is notorious for causing substantial damage to cars, roofs, and other areas of the built environment that may not be reported to the National Centers for Environmental Information. Furthermore, high losses in Stanly County indicate that neighboring counties may also be subject to additional, unreported losses. Therefore, it is likely that damages are greater than the reported value. Additionally, a single storm event may have affected multiple counties.

[21] These hail events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is likely that additional hail events have affected the Cabarrus Stanly Union Region. As additional local data becomes available, this hazard profile will be amended.

TABLE 5.19: SUMMARY OF HAIL OCCURRENCES

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Cabarrus County	**121**	**0/0**	**$0**
Concord	38	0/0	$0
Harrisburg	9	0/0	$0
Kannapolis	12	0/0	$0
Midland	3	0/0	$0
Mount Pleasant	10	0/0	$0
Unincorporated Area	49	0/0	$0
Stanly County	**63**	**0/0**	**$334,328**
Albemarle	14	0/0	$0
Badin	2	0/0	$0
Locust	5	0/0	$0
Misenhiemer	0	0/0	$0
New London	3	0/0	$0
Norwood	3	0/0	$0
Oakboro	4	0/0	$0
Red Cross	0	0/0	$0
Richfield	3	0/0	$0
Stanfield	1	0/0	$0
Unincorporated Area	28	0/0	$334,328
Union County	**125**	**0/0**	**$0**
Fairview	3	0/0	$0
Hemby Bridge	0	0/0	$0
Indian Trail	10	0/0	$0
Lake Park	0	0/0	$0
Marshville	3	0/0	$0
Marvin	1	0/0	$0
Mineral Springs	8	0/0	$0
Monroe	16	0/0	$0
Stallings	6	0/0	$0
Unionville	5	0/0	$0
Waxhaw	24	0/0	$0
Weddington	4	0/0	$0
Wesley Chapel	3	0/0	$0
Wingate	5	0/0	$0
Unincorporated Area	37	0/0	$0
Cabarrus Stanly Union Regional Total	**309**	**0/0**	**$334,328**

Source: National Centers for Environmental Information

Lightning

According to the National Centers for Environmental Information, there have been a total of 31 recorded lightning events in the Cabarrus Stanly Union Region since 1994[22]. These events resulted in

[22] These lightning events are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is certain that additional lightning events have occurred in the Cabarrus Stanly Union Region. As additional local data becomes available, this hazard profile will be amended.

nearly $3.1 million (2023 dollars) in damages, as listed in summary **Table 5.20**. Furthermore, lightning caused eight injuries throughout the Cabarrus Stanly Union Region.

It is certain that more than 31 events have impacted the region. Many of the reported events are those that caused damage. Therefore, it should be expected that damages are likely much higher for this hazard than what is reported.

TABLE 5.20: SUMMARY OF LIGHTNING OCCURRENCES

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Cabarrus County	**9**	**0/1**	**$890,312**
Concord	0	0/0	$0
Harrisburg	3	0/1	$77,548
Kannapolis	2	0/0	$66,861
Midland	0	0/0	$0
Mount Pleasant	0	0/0	$0
Unincorporated Area	4	0/0	$745,903
Stanly County	**4**	**0/3**	**$156,037**
Albemarle	2	0/0	$127,423
Badin	0	0/0	$0
Locust	0	0/0	$0
Misenhiemer	0	0/0	$0
New London	0	0/0	$0
Norwood	1	0/3	$0
Oakboro	0	0/0	$0
Red Cross	0	0/0	$0
Richfield	0	0/0	$0
Stanfield	0	0/0	$0
Unincorporated Area	1	0/0	$28,614
Union County	**18**	**0/4**	**$2,072,404**
Fairview	0	0/0	$0
Hemby Bridge	0	0/0	$0
Indian Trail	1	0/2	$0
Lake Park	0	0/0	$0
Marshville	1	0/0	$73,604
Marvin	0	0/0	$0
Mineral Springs	2	0/0	$420,632
Monroe	9	0/1	$776,668
Stallings	0	0/0	$0
Unionville	0	0/0	$0
Waxhaw	0	0/0	$0
Weddington	3	0/1	$301,497
Wesley Chapel	0	0/0	$0
Wingate	1	0/0	$30,110
Unincorporated Area	1	0/0	$469,893
Cabarrus Stanly Union Regional Total	**31**	**0/8**	**$3,118,753**

Source: National Centers for Environmental Information

5.6.4 Changing Future Conditions

Tornadoes are among the most difficult hazards to link definitively to changes in climate, partially because they are both relatively small and short-lived events when compared against wildfires, heat waves, and other climate disasters with a larger temporal and/or spatial distribution. However, the clustering of tornado systems has appeared to increase in recent years despite few changes in the total number of systems observed[23]. According to 2022 climate summary data from the NOAA National Centers for Environmental Information, tornadoes can be produced by hurricanes and severe thunderstorm systems, with the largest outbreak of 30 confirmed tornadoes and 24 deaths in North Carolina reported as of April 16, 2011.

Changing weather patterns related to climate change may also result in more frequent and more severe storms (thunderstorms, lightning, and hail) throughout the Cabarrus Stanly Union Region. According to the National Aeronautics and Space Administration (NASA), severe storm events are likely to become more frequent and intense throughout the Southeast due to radical changes in weather extremes[24].

5.6.5 Probability of Future Occurrences

Tornadoes

According to historical information, tornado events are not an annual occurrence for the region. However, in recent years, the southeastern United States, including North Carolina, has experienced a number of tornado events. While the majority of the reported tornado events are small in terms of size, intensity, and duration, they do pose a significant threat should the Cabarrus Stanly Union Region experience a direct tornado strike. The probability of future tornado occurrences affecting the Cabarrus Stanly Union Region is likely (10 to 100 percent annual probability). As of 2024, the FEMA National Risk Index rates the tornado hazard as “relatively low” in Stanly County, “relatively moderate” in Cabarrus County, and “relatively high” in Union County.

Thunderstorms

Given the high number of previous events, it is certain that wind events, including straight-line wind and thunderstorm wind, will occur in the future. This results in a probability level of highly likely (100 percent annual probability) for future wind events for the entire planning area. As of 2024, the FEMA National Risk Index rates the strong wind hazard as “relatively low” in Stanly County, “relatively moderate” in Cabarrus County, and “relatively high” in Union County.

Hailstorms

Based on historical occurrence information, it is assumed that the probability of future hail occurrences is likely (10 to 100 percent annual probability). Since hail is an atmospheric hazard (coinciding with thunderstorms), it is assumed that the entire Cabarrus Stanly Union Region has equal exposure to this hazard. It can be expected that future hail events will continue to cause minor damage to property and vehicles throughout the region. As of 2024, the FEMA National Risk Index rates the hail hazard as “relatively low” in Stanly County compared to “relatively moderate” in Cabarrus County and Union County.

Lightning

Since there were a moderate number of historical lightning events reported throughout the Cabarrus Stanly Union Region via NCEI data, it is considered a fairly regular occurrence that often accompanies

[23] Brooks et al. (2014). Increased variability of tornado occurrence in the United States. *Science* **346**(6207). https://doi.org/10.1126/science.1257460

[24] NASA Climate Change Effects (https://science.nasa.gov/climate-change/effects/)

thunderstorms. In fact, lightning events will assuredly happen on an annual basis, though not all events will cause damage. According to Vaisala's U.S. National Lightning Detection Network (NLDN) data from 2016 to 2023, the Cabarrus Stanly Union Region experiences between 8-16 events per square kilometer per year. Therefore, the probability of future events is highly likely (100 percent annual probability). It can be expected that future lightning events will continue to threaten life and cause minor property damages throughout the region. As of 2024, the FEMA National Risk Index rates the lightning hazard as "relatively moderate" in Union County compared to "relatively low" in Cabarrus County and Stanly County.

5.7 SEVERE WINTER WEATHER

5.7.1 Background and Description

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings.

All winter storm events have the potential to present dangerous conditions to the affected area. Larger snowfalls pose a greater risk, reducing visibility due to blowing snow and making driving conditions treacherous. A heavy snow event is defined by the National Weather Service as an accumulation of 4 of more inches in 12 hours or less. A blizzard is the most severe form of winter storm. It combines low temperatures, heavy snow, and winds of 35 miles per hour or more, which reduces visibility to a quarter mile or less for at least 3 hours. Winter storms are often accompanied by sleet, freezing rain, or an ice storm. Such freeze events are particularly hazardous as they create treacherous surfaces.

Ice storms are defined as storms with significant amounts of freezing rain and are a result of cold air damming (CAD). CAD is a shallow, surface-based layer of relatively cold, stably-stratified air entrenched against the eastern slopes of the Appalachian Mountains. With warmer air above, falling precipitation in the form of snow melts, then becomes either super-cooled (liquid below the melting point of water) or re-freezes. In the former case, super-cooled droplets can freeze on impact (freezing rain), while in the latter case, the re-frozen water particles are ice pellets (or sleet). Sleet is defined as partially frozen raindrops or refrozen snowflakes that form into small ice pellets before reaching the ground. They typically bounce when they hit the ground and do not stick to the surface. However, it does accumulate like snow, posing similar problems and has the potential to accumulate into a layer of ice on surfaces. Freezing rain, conversely, usually sticks to the ground, creating a sheet of ice on the roadways and other surfaces. All of the winter storm elements – snow, low temperatures, sleet, ice, etcetera – have the potential to cause significant hazard to a community. Even small accumulations can down power lines and trees limbs and create hazardous driving conditions. Furthermore, communication and power may be disrupted for days.

5.7.2 Location and Spatial Extent

Nearly the entire continental United States is susceptible to winter storm and freeze events. Some ice and winter storms may be large enough to affect several states, while others might affect limited, localized areas. The degree of exposure typically depends on the normal expected severity of local winter weather. The Cabarrus Stanly Union Region is accustomed to severe winter weather conditions and often receives winter weather during the winter months. Given the atmospheric nature of the hazard, the entire region has uniform exposure to a winter storm.

5.7.3 Historical Occurrences

Winter weather has resulted in three disaster declarations in the Cabarrus Stanly Union Region. This includes the Blizzard of 1996, one subsequent 2000 winter storm, and an ice storm in 2002[25]. According to the National Centers for Environmental Information, there have been a total of 176 recorded winter

[25] All of the participating counties were declared disaster areas for these events. A complete listing of historical disaster declarations, including the affected counties, can be found in Section 4: *Hazard Profiles*.

storm events in the Cabarrus Stanly Union Region since 1993 (**Table 5.21**)[26]. These events resulted in over $39.9 million (2023 dollars) in damages.

TABLE 5.21: SUMMARY OF WINTER STORM EVENTS

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Cabarrus County	74	0/0	$20,430,363
Stanly County	47	0/0	$0
Union County	55	0/0	$19,476,027
Cabarrus Stanly Union Regional Total	**176**	**0/0**	**$39,906,390**

Source: National Centers for Environmental Information

There have been several severe winter weather events in the Cabarrus Stanly Union Region. The text below describes three of the major events and associated impacts on the region. Similar impacts can be expected with severe winter weather.

1996 Winter Storm – January 6-8, 1996
This storm left up to two feet of snow and several thousand citizens without power for up to nine days. Although shelters were opened, some roads were impassible for up to four days. This event caused considerable disruption to business, industry, schools, and government services.

2002 Ice Storm – December 4-5, 2002
An ice storm produced up to an inch of freezing rain in central North Carolina impacting 40 counties. A total of 24 people were killed, and as many as 1.8 million people were left without electricity. Additionally, property damage was estimated at almost $100 million. New records were also set for traffic accidents and school closing durations. The scale of destruction was comparable to that of hurricanes that have impacted the state, such as Hurricane Fran in 1996. The storm cost the state $97.2 million in response and recovery.

2018 Winter Storm – December 8-9, 2018
This storm developed shortly after midnight on December 9, 2018 and continued into the afternoon. Snowfall was moderate to heavy and both sleet and rain were incorporated. Driving conditions were heavily disrupted and snowfall amounts reached up to 8 inches.

Winter storms throughout the planning area have several negative externalities including hypothermia for those individuals having to remain outdoors for a certain length of time and likely increased impact for the need of medical services, cost of snow and debris cleanup, business and government service interruption, traffic accidents, and power outages. Furthermore, citizens may resort to using inappropriate heating devices that could lead to fire or an accumulation of toxic fumes.

5.7.4 Changing Future Conditions

According to recent climate findings from NOAA, average winter temperatures in urban hubs throughout North Carolina have been noted at 2 to 4 degrees Fahrenheit above the normal average, which is defined as the 30-year Climate Normals data published from 1991 to 2020[27]. The increased

[26] These ice and winter storm events (including cold/wind chill, extreme cold/wind chill, freezing fog, frost/freeze, heavy snow, ice storm, sleet, winter storm, and winter weather) are only inclusive of those reported by the National Centers for Environmental Information (NCEI). It is likely that additional winter storm conditions have affected the Cabarrus Stanly Union Region. In addition, the events are reported by county, so many of these storms likely affected all of the counties.
[27] NOAA Winter 2022 Climate Report (https://www.ncei.noaa.gov/access/monitoring/monthly-report/national/202202)

atmospheric moisture of warmer conditions year-round also helps to intensify the water cycle. Air holds about 4% more water vapor for each additional degree Fahrenheit increase in temperature – thereby increasing the likelihood of warmer and wetter conditions in future winter seasons[28].

5.7.5 Probability of Future Occurrences

Winter storm events will remain a regular occurrence in the Cabarrus Stanly Union Region due to its location in the western part of the state. According to historical information the Cabarrus Stanly Union Region often experiences several winter storms events each year. Therefore, the annual probability is likely (10 to 100 percent annual probability). As of 2024, the FEMA National Risk Index rates the winter weather hazard as “very low” in Cabarrus County and Stanly County compared to “relatively low” in Union County.

[28] U.S. Climate Resilience Toolkit, Southeast (https://toolkit.climate.gov/regions/southeast)

5.8 EARTHQUAKES

5.8.1 Background and Description

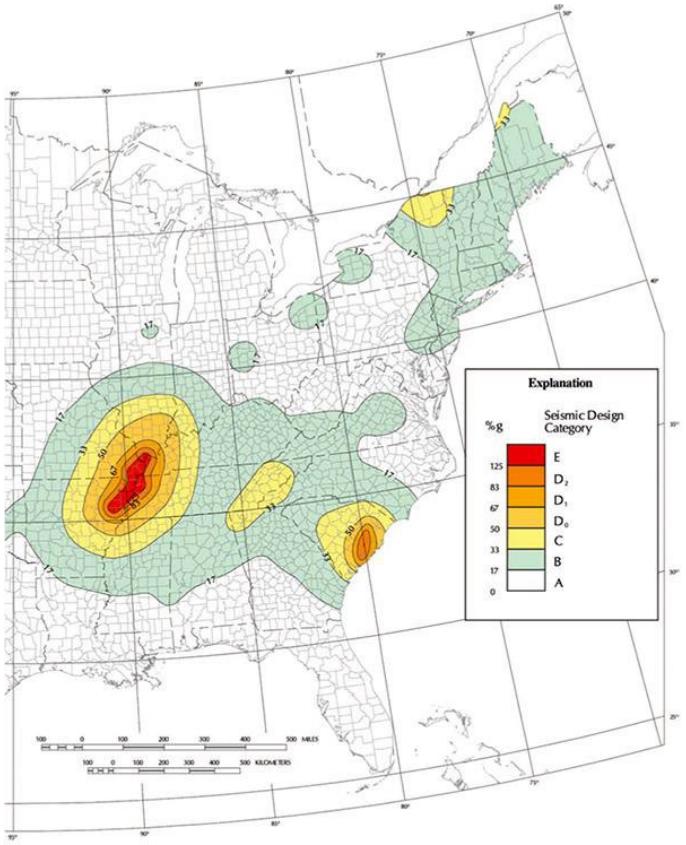
An earthquake is movement or trembling of the ground produced by sudden displacement of rock in the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area.

Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault, site, and regional geology. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (mountain regions and along hillsides), and liquefaction, in which ground soil loses the ability to resist shear and flows much like quicksand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

Most earthquakes are caused by the release of stresses accumulated as a result of the rupture of rocks along opposing fault planes in the Earth’s outer crust. These fault planes are typically found along borders of the Earth's 10 tectonic plates. The areas of greatest tectonic instability occur at the perimeters of the slowly moving plates. Deformations at plate boundaries can lead to fractures as energy builds. The rock on both sides of the fracture is then snapped, releasing the stored energy and producing seismic waves, generating an earthquake.

The greatest earthquake threat in the United States is along tectonic plate boundaries and seismic fault lines located in the central and western states; however, the Eastern United States does face moderate risk to less frequent, less intense earthquake events. **Figure 5.9** shows relative seismic risk for the United States.

FIGURE 5.9: EASTERN UNITED STATES EARTHQUAKE HAZARD MAP



Source: Federal Emergency Management Agency

Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude (**Table 5.22**). Each unit increase in magnitude on the Richter Scale corresponds to a 10-fold increase in wave amplitude, or a 32-fold increase in energy. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. The scale levels are typically described using roman numerals, ranging from "I" corresponding to imperceptible (instrumental) events to "XII" for catastrophic (total destruction). A detailed description of the Modified Mercalli Intensity Scale of earthquake intensity and its correspondence to the Richter Scale is given in **Table 5.23**.

TABLE 5.22: RICHTER SCALE

Richter Magnitudes	Earthquake Effects
< 3.5	Generally not felt, but recorded.
3.5 – 5.3	Often felt, but rarely causes damage.
5.4 – 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 – 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 – 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency

TABLE 5.23: MODIFIED MERCALLI INTENSITY SCALE FOR EARTHQUAKES

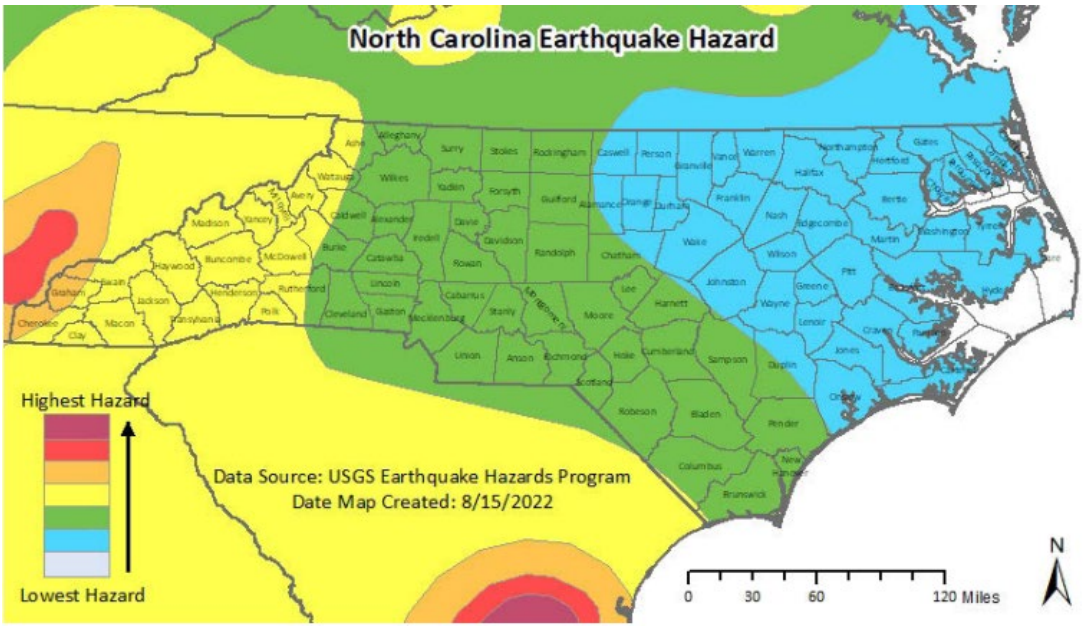
Scale	Intensity	Description of Effects	Corresponding Richter Scale Magnitude
I	Not felt	Not felt except by a very few under especially favorable conditions.	
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.	< 4.2
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.	
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.	
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.	< 4.8
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.	< 5.4
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.	< 6.1
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.	
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.	< 6.9
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.	< 7.3
I	Not felt	Not felt except by a very few under especially favorable conditions.	< 8.1
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.	> 8.1

Source: Federal Emergency Management Agency

5.8.2 Location and Spatial Extent

Approximately two-thirds of North Carolina is subject to earthquakes, with the western and southeast region most vulnerable to a very damaging earthquake. The state is affected by both the Charleston Fault in South Carolina and New Madrid Fault in Tennessee. Both of these faults have generated earthquakes measuring greater than 8 on the Richter Scale during the last 200 years. In addition, there are several smaller fault lines throughout North Carolina. **Figure 5.10** is a map showing geological and seismic information for North Carolina.

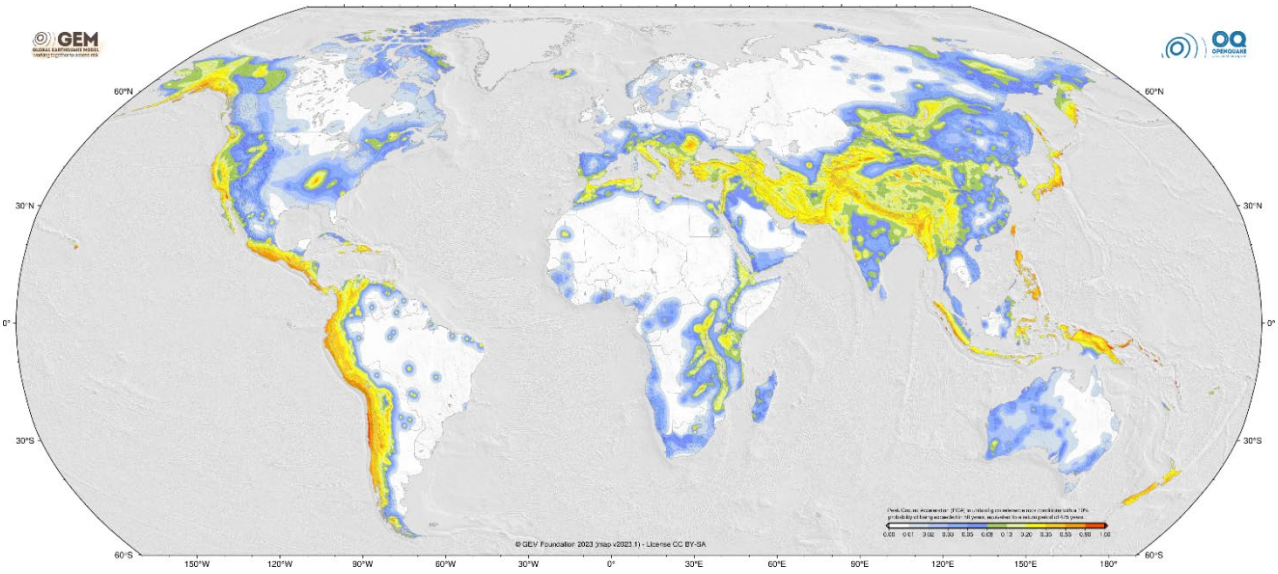
FIGURE 5.10: GEOLOGICAL AND SEISMIC INFORMATION FOR NORTH CAROLINA



Source: North Carolina Geological Survey

Figure 5.11 shows the intensity level associated with the world and the Cabarrus Stanly Union Region, based on the national USGS and Global Earthquake Model (GEM). The Global Earthquake Model Global Seismic Hazard Map depicts the geographic distribution of the Peak Ground Acceleration (PGA) with a 10% probability of being exceeded in 50 years. The data represents the probability that the ground motion will reach a certain level during an earthquake. The map was created by collating maps computed using national and regional probabilistic seismic hazard models developed by various institutions and projects, and by GEM Foundation scientists. This indicates that the region as a whole exists within an area of low to moderate seismic risk.

FIGURE 5.11: PEAK ACCELERATION WITH 10 PERCENT PROBABILITY OF EXCEEDANCE IN 50 YEARS



Source: Global Earthquake Model, 2023

5.8.3 Historical Occurrences

At least 16 earthquakes are known to have affected the Cabarrus Stanly Union Region since 1886. The strongest of these measured a VI on the Modified Mercalli Intensity (MMI) scale. **Table 5.24** provides a summary of earthquake events reported by the USGS and NOAA between 1638 and 2024.

TABLE 5.24: SUMMARY OF SEISMIC ACTIVITY

Location	Number of Occurrences	Greatest MMI Reported	Richter Scale Equivalent
Cabarrus County	**7**	**VI**	**7**
Concord	3	VI	7
Harrisburg	1	III	4
Kannapolis	2	IV	4
Midland	0	--	--
Mount Pleasant	1	II	3
Unincorporated Area	0	--	--
Stanly County	**4**	**V**	**5**
Albemarle	1	V	5
Badin	0	--	--
Locust	0	--	--
Misenhiemer	0	--	--
New London	1	III	4
Norwood	0	--	--
Oakboro	1	III	4
Red Cross	0	--	--
Richfield	1	III	4
Stanfield	0	--	--
Unincorporated Area	0	--	--
Union County	**5**	**VI**	**7**
Fairview	0	--	--
Hemby Bridge	0	--	--
Indian Trail	1	I	2
Lake Park	0	--	--
Marshville	1	I	2
Marvin	0	--	--
Mineral Springs	0	--	--
Monroe	2	VI	7
Stallings	0	--	--
Unionville	0	--	--
Waxhaw	0	--	--
Weddington	0	--	--
Wesley Chapel	0	--	--
Wingate	0	--	--
Unincorporated Area	1	I	2
Cabarrus Stanly Union Regional Total	**16**	**VI**	**7**

Source: NOAA, USGS

Note: Future updates of the plan will continue to provide more context to previously reported earthquake events.

In addition to those earthquakes specifically affecting the Cabarrus Stanly Union Region, a list of earthquakes that have caused damage throughout North Carolina is presented below in **Table 5.25.**

TABLE 5.25: EARTHQUAKES WHICH HAVE CAUSED DAMAGE IN NORTH CAROLINA

Date	Location	Richter Scale (Magnitude)	MMI (Intensity)	MMI in North Carolina
12/16/1811 - 1	NE Arkansas	8.5	XI	VI
12/16/1811 - 2	NE Arkansas	8.0	X	VI
12/18/1811 - 3	NE Arkansas	8.0	X	VI
01/23/1812	New Madrid, MO	8.4	XI	VI
02/071812	New Madrid, MO	8.7	XII	VI
04/29/1852	Wytheville, VA	5.0	VI	VI
08/31/1861	Wilkesboro, NC	5.1	VII	VII
12/23/1875	Central Virginia	5.0	VII	VI
08/31/1886	Charleston, SC	7.3	X	VII
05/31/1897	Giles County, VA	5.8	VIII	VI
01/01/1913*	Union County, SC	4.8	VII	VI
02/21/1916*	Asheville, NC	5.5	VII	VII
07/08/1926	Mitchell County, NC	5.2	VII	VII
11/03/1928*	Newport, TN	4.5	VI	VI
05/13/1957*	McDowell County, NC	4.1	VI	VI
07/02/1957	Buncombe County, NC	3.7	VI	VI
11/24/1957	Jackson County, NC	4.0	VI	VI
10/27/1959 **	Chesterfield, SC	4.0	VI	VI
07/13/1971	Newry, SC	3.8	VI	VI
11/30/1973*	Alcoa, TN	4.6	VI	VI
11/13/1976	Southwest Virginia	4.1	VI	VI
05/05/1981	Henderson County, NC	3.5	VI	VI
08/09/2020	Sparta, NC	5.1	VII	VII

Source: This information was compiled by Dr. Kenneth B. Taylor and provided by Tiawana Ramsey of NCEM. Information was compiled from the National Earthquake Center, Earthquakes of the US by Carl von Hake (1983), and a compilation of newspaper reports in the Eastern Tennessee Seismic Zone compiled by Arch Johnston, CERI, Memphis State University (1983).

5.8.4 Changing Future Conditions

According to the North Carolina Department of Environmental Quality (NCDEQ), despite infrequent occurrences of severe seismic events and no active fault zones in the state, North Carolina is bordered by the Middleton Place-Summerville Seismic Zone (near Charleston, SC) to the south, East Tennessee Seismic Zone to the west, and Central Virginia Seismic Zone to the north[29]. Although strong earthquakes are rare in North Carolina, there have still been several notable events recorded across susceptible regions of the state within the last 100 years alone. A single event of magnitude 5 or greater can easily cut off critical infrastructure around the mountains and cause residual structural damage over a large area. Current building and development practices may account for this hazard in their designs, but significant portions of existing development, especially in more rural or older areas, will remain vulnerable to earthquakes without any new structural interventions. Earthquakes are primarily influenced by tectonic processes and although they could potentially be affected by climate factors such as droughts these connections remain unclear[30].

5.8.5 Probability of Future Occurrences

The probability of significant, damaging earthquake events affecting the Cabarrus Stanly Union Region is

[29] NCDEQ Earthquakes (https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/north-carolina-geological-survey/geologic-hazards/earthquakes-north-carolina)
[30] NASA Science (https://science.nasa.gov/earth/climate-change/can-climate-affect-earthquakes-or-are-the-connections-shaky/#h-getting-the-big-picture-of-the-earth-system-s-interconnectivity)

unlikely. However, it is possible that future earthquakes resulting in light to moderate perceived shaking and damages ranging from none to very light will affect the region. The annual probability level for the region is estimated between 1 and 10 percent (possible). The USGS also uses historical data to predict the probability of a major earthquake (equivalent to Modified Mercalli Intensity VI or greater) within the next 100 years, reporting a 5-25% chance for North Carolina as of 2023[31]. As of 2024, the FEMA National Risk Index rates the earthquake hazard as "relatively low" for Cabarrus County and Union County compared to "very low" for Stanly County.

[31] USGS National News Release (https://www.usgs.gov/news/national-news-release/new-usgs-map-shows-where-damaging-earthquakes-are-most-likely-occur-us)

5.9 GEOLOGICAL

5.9.1 Background and Description

For the purposes of maintaining consistency with the State of North Carolina Hazard Mitigation Plan, this section will assess geological hazards which include landslides, sinkholes, and erosion.

Landslides

A landslide is the downward and outward movement of slope-forming soil, rock, and vegetation, which is driven by gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, volcanic eruptions, and changes in groundwater levels.

There are several types of landslides: rock falls, rock topple, slides, and flows. Rock falls are rapid movements of bedrock, which result in bouncing or rolling. A topple is a section or block of rock that rotates or tilts before falling to the slope below. Slides are movements of soil or rock along a distinct surface of rupture, which separates the slide material from the more stable underlying material.

Mudflows, sometimes referred to as mudslides, mudflows, lahars or debris avalanches, are fast-moving rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as heavy rainfall or rapid snowmelt, changing the soil into a flowing river of mud or "slurry." Slurry can flow rapidly down slopes or through channels and can strike with little or no warning at avalanche speeds. Slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way. As the flows reach flatter ground, the mudflow spreads over a broad area where it can accumulate in thick deposits. Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly.

Among the most destructive types of debris flows are those that accompany volcanic eruptions. A spectacular example in the United States was a massive debris flow resulting from the 1980 eruptions of Mount St. Helens, Washington. Areas near the bases of many volcanoes in the Cascade Mountain Range of California, Oregon, and Washington are at risk from the same types of flows during future volcanic eruptions.

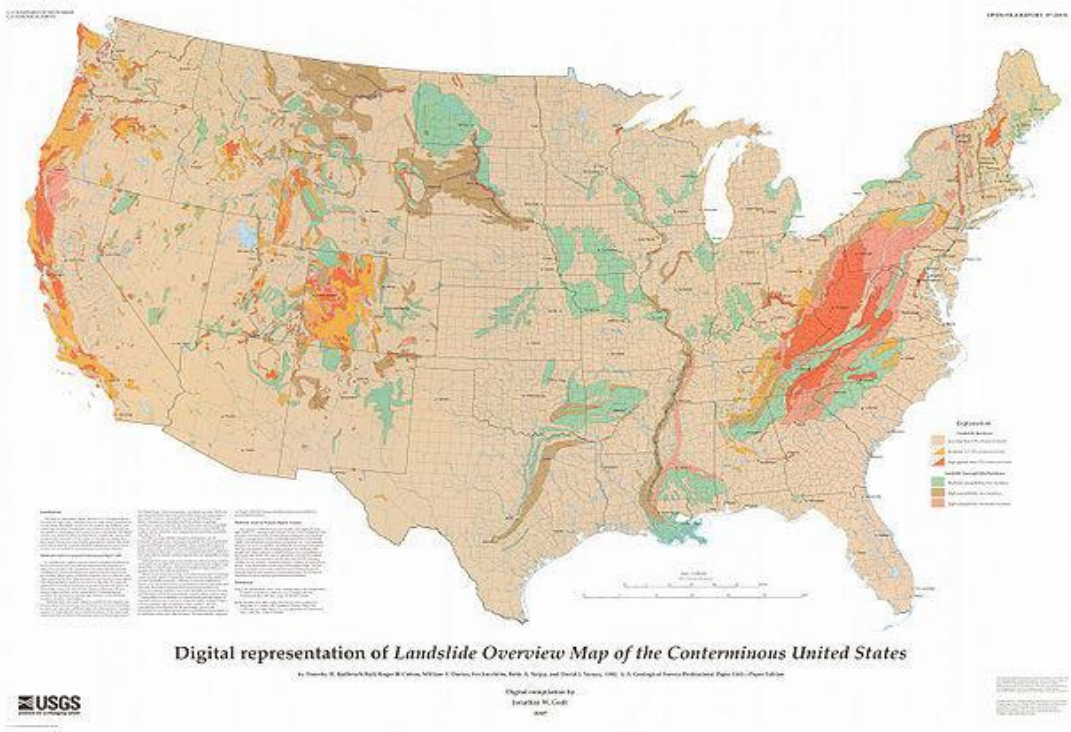
Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, and developed hillsides where leach-field septic systems are used. Areas that are typically considered safe from landslides include areas that have not moved in the past, relatively flat-lying areas away from sudden changes in slope, and areas at the top or along ridges set back from the tops of slopes.

According to the United States Geological Survey, each year landslides cause $5.4 billion (2023 dollars) in damage and between 25 and 50 deaths in the United States[32]. **Figure 5.12** delineates areas where

[32] United States Geological Survey (USGS). United States Department of the Interior. "Landslide Hazards – A National Threat." 2005.

large numbers of landslides have occurred and areas that are susceptible to landsliding in the conterminous United States[33].

FIGURE 5.12: LANDSLIDE OVERVIEW MAP OF THE CONTERMINOUS UNITED STATES[34]



Landslide Incidence		Landslide Susceptibility/Incidence	
	Low Incidence (less than 1.5% of area involved)		Moderate susceptibility/low incidence
	Moderate Incidence (1.5%-15% of area involved)		High susceptibility/low incidence
	High Incidence (greater than 15% of area involved		High susceptibility/moderate incidence

Source: USGS

Sinkholes

According to the United States Geological Survey, a sinkhole is an area of ground that has no natural external surface drainage--when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes can vary from a few feet to hundreds of acres and from less than 1 to more than 100 feet deep. Some are shaped like shallow bowls or saucers whereas others have vertical walls.

[33] This map layer is provided in the U.S. Geological Survey Professional Paper 1183, Landslide Overview Map of the Conterminous United States, available online at: https://www.usgs.gov/programs/landslide-hazards.

[34] Susceptibility not indicated where same or lower than incidence. Susceptibility to landsliding was defined as the probable degree of response of [the area] rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. High, moderate, and low susceptibility are delimited by the same percentages used in classifying the incidence of landsliding. Some generalization was necessary at this scale, and several small areas of high incidence and susceptibility were slightly exaggerated.

Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that can naturally be dissolved by groundwater circulating through them. As the rock dissolves, spaces and caverns develop underground. Sinkholes are dramatic because the land usually stays intact for a while until the underground spaces just get too big. If there is not enough support for the land above the spaces then a sudden collapse of the land surface can occur. These collapses can be small, or, as **Figure 5.13** below shows, they can be huge and can occur where a house or road is on top[35].

FIGURE 5.13: SINKHOLE IN NORTH CAROLINA

Source: NCEM

Erosion

Erosion is the gradual breakdown and movement of land due to both physical and chemical processes of water, wind, and general meteorological conditions. Natural, or geologic, erosion has occurred since the Earth's formation and continues at a very slow and uniform rate each year.

There are two types of soil erosion: wind erosion and water erosion. Wind erosion can cause significant soil loss. Winds blowing across sparsely vegetated or disturbed land can pick up soil particles and carry them through the air, thus displacing them. Water erosion can occur over land or in streams and channels. Water erosion that takes place over land may result from raindrops, shallow sheets of water flowing off the land, or shallow surface flow, which becomes concentrated in low spots. Stream channel erosion may occur as the volume and velocity of water flow increases enough to cause movement of the streambed and bank soils. Major storms, such hurricanes in coastal areas, may cause significant erosion by combining high winds with heavy surf and storm surge to significantly impact the shoreline.

An area's potential for erosion is determined by four factors: soil characteristics, vegetative cover, topography climate or rainfall, and topography. Soils composed of a large percentage of silt and fine sand are most susceptible to erosion. As the clay and organic content of these soils increases, the

[35] Sinkholes. United States Geological Survey. Retrieved from: https://www.usgs.gov/special-topics/water-science-school/science/sinkholes

potential for erosion decreases. Well-drained and well-graded gravels and gravel-sand mixtures are the least likely to erode. Coarse gravel soils are highly permeable and have a good capacity for absorption, which can prevent or delay the amount of surface runoff. Vegetative cover can be very helpful in controlling erosion by shielding the soil surface from falling rain, absorbing water from the soil, and slowing the velocity of runoff. Runoff is also affected by the topography of the area including size, shape, and slope. The greater the slope length and gradient, the more potential an area has for erosion. Climate can affect the amount of runoff, especially the frequency, intensity, and duration of rainfall and storms. When rainstorms are frequent, intense, or of long duration, erosion risks are high. Seasonal changes in temperature and rainfall amounts define the period of highest erosion risk of the year.

During the past 20 years, the importance of erosion control has gained the increased attention of the public. Implementation of erosion control measures consistent with sound agricultural and construction operations is needed to minimize the adverse effects associated with harmful chemicals run-off due to wind or water events. The increase in government regulatory programs and public concern has resulted in a wide range of erosion control products, techniques, and analytical methodologies in the United States. The preferred method of erosion control in recent years has been the restoration of vegetation.

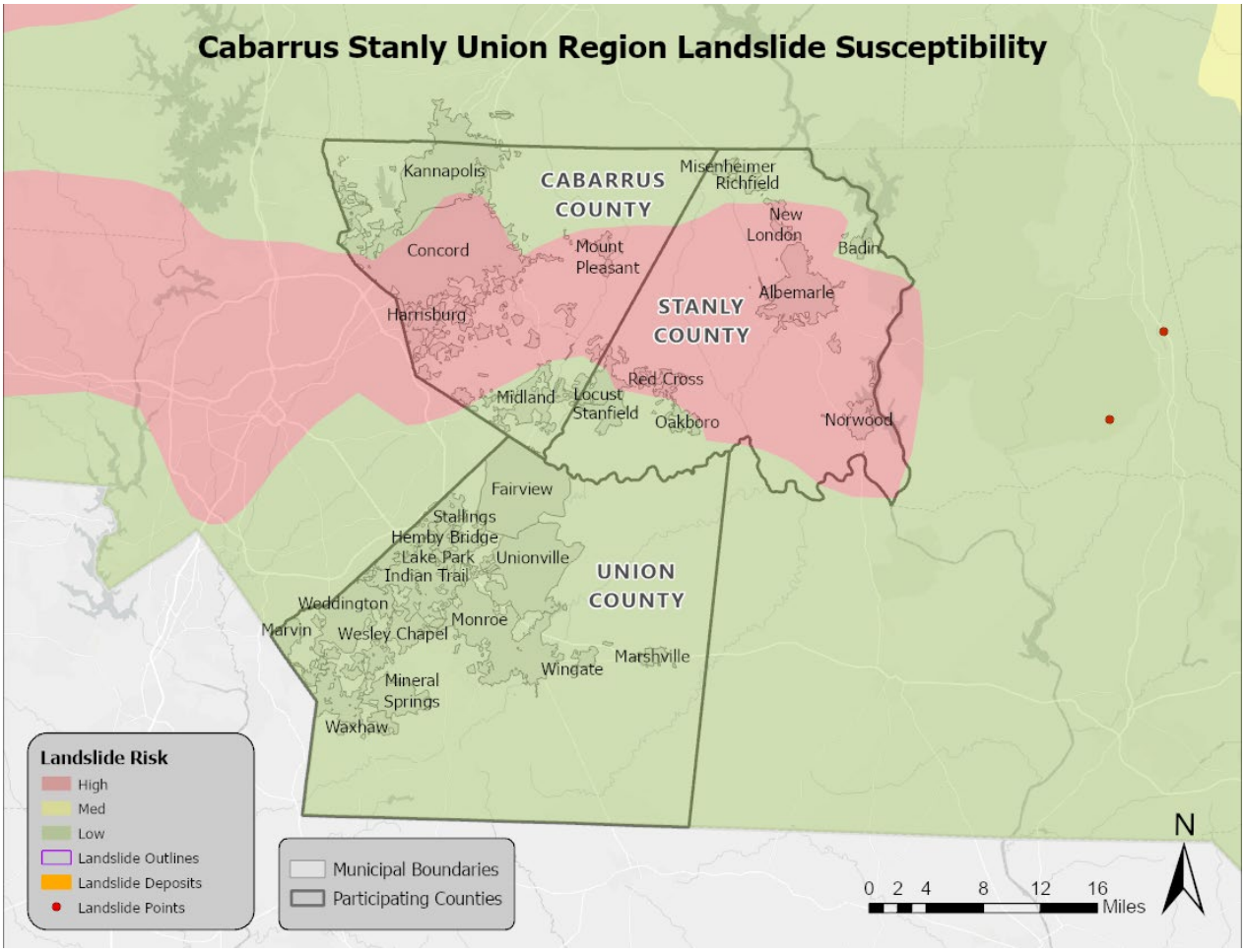
5.9.2 Location and Spatial Extent

Landslides

Landslides occur along steep slopes when the pull of gravity can no longer be resisted (often due to heavy rain throughout the region). Human development can also exacerbate risk by building on previously undevelopable steep slopes and constructing roads by cutting through mountains. Landslides are possible throughout the Cabarrus Stanly Union Region.

According to **Figure 5.14** below, landslide activity is limited in the region based on existing North Carolina Geological Survey inventories. However, previous risk mapping from the USGS has identified large central areas of both Cabarrus County and Stanly County at high risk.

FIGURE 5.14: CABARRUS STANLY UNION REGION LANDSLIDE SUSCEPTIBILITY

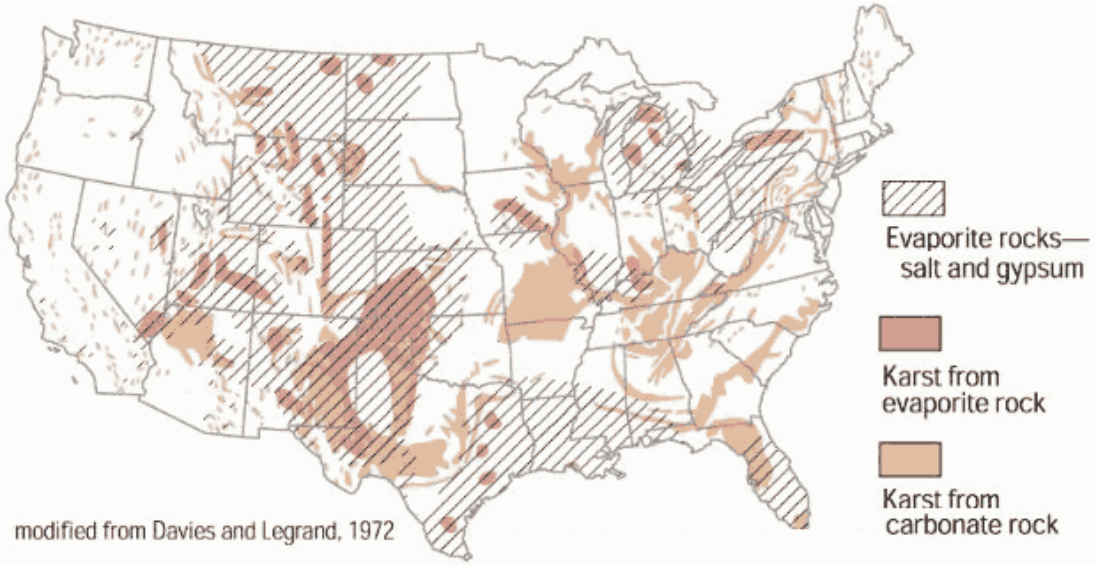


Source: United States Geological Survey, North Carolina Geological Survey

Sinkholes

Figure 5.15 below shows areas of the United States where certain rock types that are susceptible to dissolution in water occur. In these areas, the formation of underground cavities can form and catastrophic sinkholes can happen. These rock types are evaporites (salt, gypsum, and anhydrite) and carbonates (limestone and dolomite). Evaporite rocks underlie about 35 to 40 percent of the United States, though in many areas they are buried at great depths. In some cases, sinkholes in North Carolina have been measured at up to 20 to 25 feet in depth, with similar widths.

FIGURE 5.15: UNITED STATES GEOLOGICAL SURVEY OF KARST MODIFIED FROM DAVIES AND LEGRAND, 1972



Erosion

Erosion in the Cabarrus Stanly Union Region is typically caused by flash flooding events. Unlike coastal areas, where the soil is mainly composed of fine-grained particles such as sand, Cabarrus Stanly Union regional soils have much greater organic matter content. Furthermore, vegetation also helps to prevent erosion in the area. Erosion occurs in the Cabarrus Stanly Union Region, particularly along the banks of rivers and streams, but it is not an extreme threat to any of the participating counties and jurisdictions. No areas of concern were reported by the planning committee.

5.9.3 Historical Occurrences

Landslides

Steep topography in some areas of the Cabarrus Stanly Union Region makes the planning area susceptible to landslides. Most landslides are caused by heavy rainfall in the area. Building on steep slopes that was not previously possible also contributes to risk. The locations of landslide events as provided by the North Carolina Geological Survey in the Western North Carolina Landslide Hazard Database showed that there were no reported incidents in the region[36]. Some incidence mapping has also been completed throughout the western portion of North Carolina though it is not complete. Therefore, it should be noted that many more incidents than what is reported are likely to have occurred in Cabarrus, Stanly, and Union Counties.

Sinkholes

In North Carolina, most sinkholes occur in the southern coastal plain due to the high concentration of limestone; however, they are also common in the western part of the state and in the Cabarrus Stanly Union region. According to a search of local media outlets across the state, the western area has experienced more than 40 sinkholes over the past 20 years. There are no historical occurrences of sinkholes in the region.

[36] NCDEQ Landslide Hazard Data (https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/north-carolina-geological-survey/geologic-hazards/landslides)

Erosion

Most historical occurrences of erosion are seen near the coast of North Carolina, but the Cabarrus Stanly Union Region is still susceptible to the hazard. Several sources were vetted to identify areas of erosion in the Cabarrus Stanly Union Region. This includes searching local newspapers, consulting local officials at meetings, and reviewing previous hazard mitigation plans. Little information could be found beyond the hazard mitigation plans. Erosion was referenced in the previous Cabarrus Stanly Union Regional Hazard Mitigation Plan, but there was no recorded history of significant erosion events and it was found to be hazard with a negligible potential impact.

5.9.4 Changing Future Conditions

According to the North Carolina Climate Risk Assessment and Resilience Plan as of 2020, the number of landslides statewide is increasing due to more extreme rainfall events. As the global climate continues to change, both storm intensity and rainfall rates affecting North Carolina are projected to increase in tandem[37]. According to the USGS, pumping water and its associated drawdown of the water table is a primary risk factor associated with sinkholes. The potential impacts of climate change could accelerate this dynamic as well. For example, altered rainfall patterns and increasing rates of evaporation due to higher temperatures can lead to a decrease in subsurface groundwater flow, resulting in changing sinkhole formations. Decreased groundwater flow could lead to additional water pumping and related drawdowns near urban and industrial areas capable of reducing water tables and contributing to the formation of new sinkholes[38].

5.9.5 Probability of Future Occurrences

Landslides

Based on historical information and the USGS susceptibility index, the probability of future landslide events is possible (1 to 10 percent annual probability). Local conditions may become more favorable for landslides due to heavy rain, for example. This would increase the likelihood of occurrence. It should also be noted that some areas in the Cabarrus Stanly Union Region have greater risk than others given factors such as steepness on slope and modification of slopes. As of 2024, the FEMA National Risk Index rates the landslide hazard as “relatively moderate” in Cabarrus County compared to “relatively low” in Stanly County and Union County.

Sinkholes

Sinkholes have also affected parts of North Carolina in recent history, but most of those impacts have been in the southeastern region of the state, not the Cabarrus Stanly Union region. While many sinkholes have been relatively small, it is still unlikely (less than 1 percent annual probability) that this region will continue to be affected in the future.

Erosion

Erosion remains a natural, dynamic, and continuous process for the Cabarrus Stanly Union Region, and it will continue to occur. The annual probability level assigned for erosion is possible (between 1 and 10 percent annual probability). However, given the lack of historical events, location, data, and threat to life or property, no further analysis will be done in Section 6: *Vulnerability Assessment*.

[37] 2020 NC Climate Risk Assessment and Resilience Plan (https://www.deq.nc.gov/energy-climate/climate-change/nc-climate-change-interagency-council/climate-change-clean-energy-plans-and-progress/nc-climate-risk-assessment-and-resilience-plan)
[38] USGS Sinkholes (https://www.usgs.gov/special-topics/water-science-school/science/sinkholes)

5.10 DAM FAILURE

5.10.1 Background and Description

Worldwide interest in dam and levee safety has risen significantly in recent years. Aging infrastructure, new hydrologic information, and population growth in floodplain areas downstream from dams and near levees have resulted in an increased emphasis on safety, operation, and maintenance.

There are approximately 91,000 dams in the United States today, the majority of which are privately owned. Other owners include state and local authorities, public utilities, and federal agencies. The benefits of dams are numerous: they provide water for drinking, navigation, and agricultural irrigation. Dams also provide hydroelectric power, create lakes for fishing and recreation, and save lives by preventing or reducing floods.

Though dams have many benefits, they also can pose a risk to communities if not designed, operated, and maintained properly. In the event of a dam failure, the energy of the water stored behind even a small dam is capable of causing loss of life and great property damage if development exists downstream. If a levee breaks, scores of properties may become submerged in floodwaters and residents may become trapped by rapidly rising water. The failure of dams and levees has the potential to place large numbers of people and great amounts of property in harm's way.

5.10.2 Location and Spatial Extent

The North Carolina Division of Energy, Mineral, and Land Resources provides information on dams, including a hazard potential classification. There are three hazard classifications—high, intermediate, and low—that correspond to qualitative descriptions and quantitative guidelines. **Table 5.26** explains these classifications.

TABLE 5.26: NORTH CAROLINA DAM HAZARD CLASSIFICATIONS

Hazard Classification	Description	Quantitative Guidelines
Low	Interruption of road service, low volume roads Less than 25 vehicles per day	Less than 25 vehicles per day
	Economic Damage	Less than $30,000
Intermediate	Damage to highways, Interruption of service	25 to less than 250 vehicles per day
	Economic Damage	$30,000 to less than $200,000
High	Loss of human life*	Probable loss of 1 or more human lives
	Economic Damage	More than $200,000
	*Probable loss of human life due to breached roadway or bridge on or below the dam	250 or more vehicles per day

Source: North Carolina Division of Energy, Mineral, and Land Resources

According to the North Carolina Division of Energy, Mineral, and Land Resources Dam Safety Program as of July 2024, there are 336 dams in the Cabarrus Stanly Union Region[39]. **Figure 5.17** shows the dam location and the corresponding hazard ranking for each. Of these dams, 82 are classified as high hazard potential. These high hazard dams are summarized by county in **Table 5.27.**

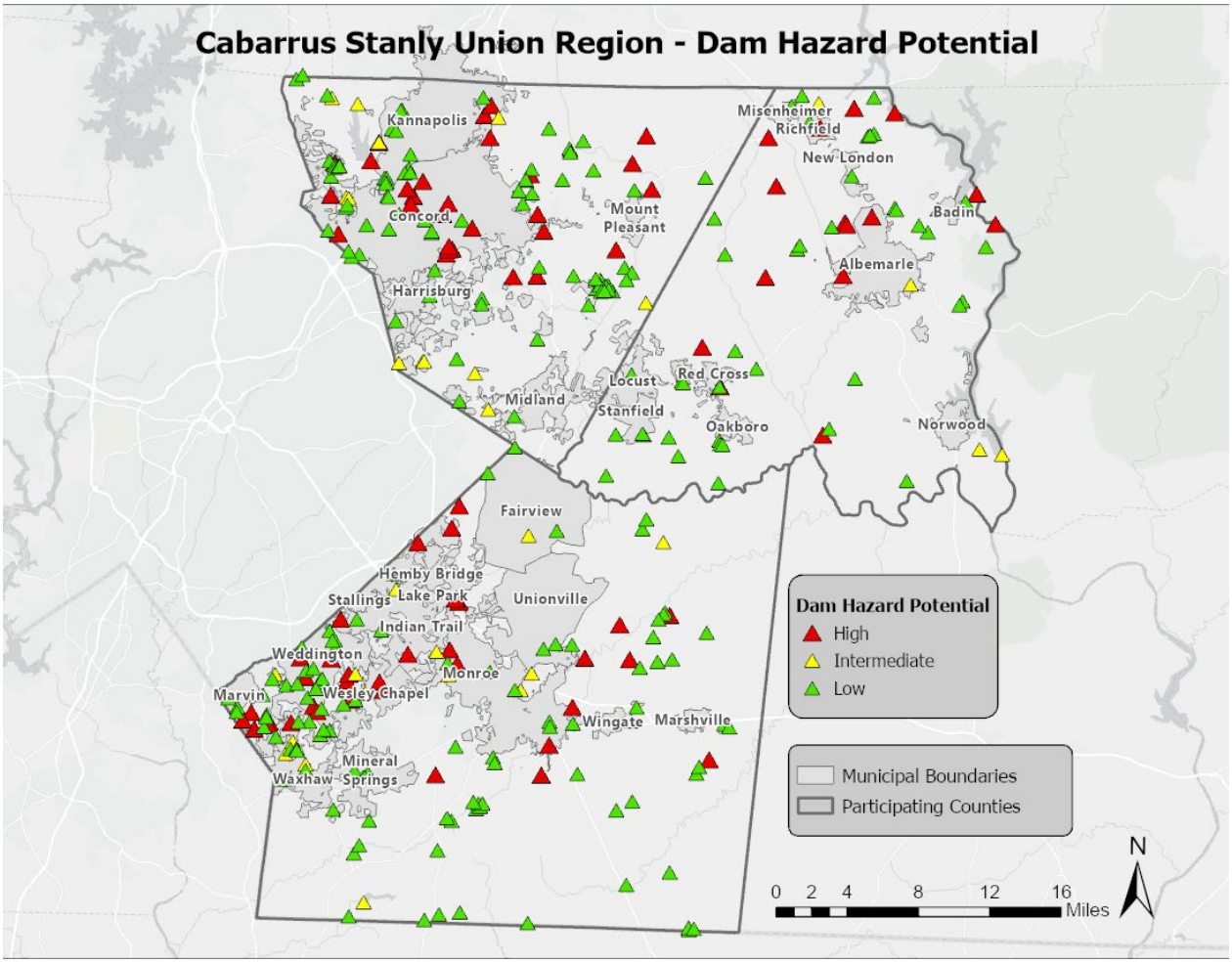
[39] The July 2024 list of high hazard dams was obtained from the North Carolina Division of Energy, Mineral, and Land Resources (https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/dam-safety).

TABLE 5.27: SUMMARY OF HIGH HAZARD DAM LOCATIONS

Location	Number High Hazard Dams
Cabarrus County	29
Stanly County	15
Union County	38
Cabarrus Stanly Union Region Total	**82**

Source: North Carolina Division of Energy, Mineral, and Land Resources

FIGURE 5.17: CABARRUS STANLY UNION REGION HIGH-HAZARD DAM LOCATIONS



Source: North Carolina Division of Energy, Mineral, and Land Resources

It should also be noted that dam regulations for classifying dams was changed in recent history. As a result, generally more dams are classified as high hazard.

5.10.3 Historical Occurrences

According to the North Carolina Division of Energy, Mineral, and Land Resources as of July 2024, there have been a total of at least five dams with a breach status reported in the Cabarrus Stanly Union Region, including one in Cabarrus County, two in Stanly County, and two in Union County. All breached dams are considered low risk. Additionally, several potential future breach scenarios in the region could be catastrophic.

5.10.4 Changing Future Conditions

Changing climate and weather patterns may not affect dams as directly when compared to other hazards. However, a significant projected rise in various extreme weather events could affect dams negatively in the form of higher floodwaters, changing streamflow, structural damages, and other key risk factors. Dam failures present recurring dangers of widespread flooding, which would greatly impact the Cabarrus Stanly Union Region in a breach scenario.

5.10.5 Probability of Future Occurrence

Given the current dam inventory and historic data, a dam breach is unlikely (less than 1 percent annual probability) in the future. However, as has been demonstrated in the past, regular monitoring is necessary to prevent these events. No further analysis beyond information from the North Carolina Department of Environmental Quality Dam Safety Program will be completed in ***Section 6*: *Vulnerability Assessment*** as more sophisticated dam breach plans continue to be explored and developed for regional dams of concern.

5.11 FLOODING

5.11.1 Background and Description

Flooding is the most frequent and costly natural hazard in the United States and is a hazard that has caused more than 10,000 deaths since 1900. Nearly 90 percent of presidential disaster declarations result from natural events where flooding was a major component. Flooding is also a uniquely dangerous hazard due to the wide range of compounding hazards (e.g., hurricanes, thunderstorms, heat waves, earthquakes) that can exacerbate its frequency, intensity, and scale of impact.

Floods generally result from excessive precipitation and can be classified under two categories: general floods, precipitation over a given river basin for a long period of time along with storm-induced wave action, and flash floods, the product of heavy localized precipitation in a short time period over a given location. The severity of a flooding event is typically determined by a combination of several major factors, including stream and river basin topography and physiography, precipitation and weather patterns, recent soil moisture conditions, and the degree of vegetative clearing and impervious surface.

General floods are usually long-term events that may last for several days. The primary types of general flooding include riverine, coastal, and urban flooding. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river. Coastal flooding is typically a result of storm surge, wind-driven waves, and heavy rainfall produced by hurricanes, tropical storms, and other large coastal storms. Urban flooding occurs where manmade development has obstructed the natural flow of water and decreased the ability of natural groundcover to absorb and retain surface water runoff. Urban flooding and the stormwater management it requires poses significant challenges for critical facility operations, emergency response, transportation access, and utility services as developed areas continue to grow. In the event of road inundation, structural breaches, or mechanical failures due to floodwaters the response times to many hazard events may take much longer than originally anticipated. Increasing needs for flood mitigation measures are ongoing across every municipality included in this plan (especially in highly urbanized areas).

Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. However, flash flooding events may also occur from a dam or levee failure within minutes or hours of heavy amounts of rainfall or from a sudden release of water held by a retention basin or other stormwater control facility. Although flash flooding occurs most often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.

The periodic flooding of lands adjacent to rivers, streams, and shorelines (land known as a floodplain) is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood and the 100-year floodplain by the 100-year flood. Flood frequencies, such as the 100-year flood, are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1 percent

chance of occurring in any given year and the 500-year flood has a 0.2 percent chance of occurring in any given year.

5.11.2 Location and Spatial Extent

There are areas in the Cabarrus Stanly Union Region that are susceptible to flood events. Floodplain maps for each jurisdiction in the region can be viewed in **Appendix F**. Special Flood Hazard Areas (SFHAs) in the Cabarrus Stanly Union Region were mapped using Geographic Information System (GIS) and FEMA Digital Flood Insurance Rate Maps (DFIRM)[40]. This includes Zone A (1-percent annual chance floodplain), Zone AE (1-percent annual chance floodplain with elevation), and Zone X500 (0.2-percent annual chance floodplain). According to GIS analysis, of the 2,357 square miles that make up the Cabarrus Stanly Union Region, there are approximately 98 square miles of land in zones A and AE (1-percent annual chance floodplain/100-year floodplain) and 6.85 square miles of land in zone X500 (0.2-percent annual chance floodplain/500-year floodplain). The county totals are presented below in **Table 5.28**.

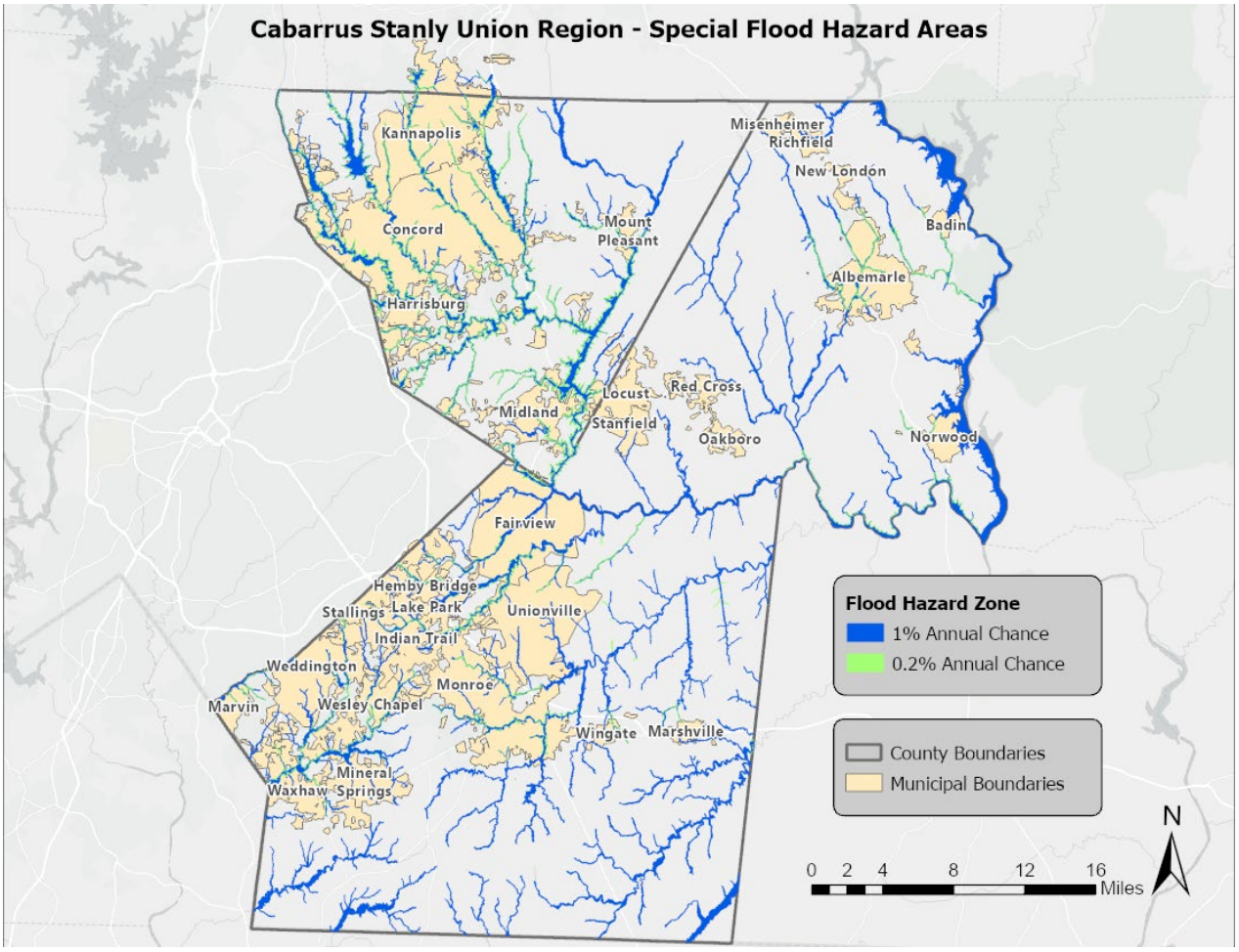
TABLE 5.28: SUMMARY OF FLOODPLAIN AREAS

Location	100-year area (square miles)	500-year area (square miles)
Cabarrus County	32.77	4.63
Stanly County	25.17	0.55
Union County	39.89	1.67
CABARRUS STANLY UNION REGION TOTAL	**97.83**	**6.85**

These flood zone values account for roughly 4.4 percent of the total land area in the Cabarrus Stanly Union Region. It is important to note that while FEMA digital flood data is recognized as best available data for planning purposes, it does not always reflect the most accurate and up-to-date flood risk. Flooding and flood-related losses often do occur outside of delineated Special Flood Hazard Areas and localized reports from the counties and municipalities indicate that this type of flooding is occurring more frequently. **Figure 5.18** illustrates the location and extent of currently mapped Special Flood Hazard Areas for the Cabarrus Stanly Union Region based on best available FEMA DFIRM data from 2024.

[40] The county-level DFIRM map data used for Cabarrus County was updated in 2023, Stanly County in 2018, and Union County in 2023.

FIGURE 5.18: SPECIAL FLOOD HAZARD AREAS



Source: Federal Emergency Management Agency

5.11.3 Historical Occurrences

Information from the National Centers for Environmental Information was used to ascertain historical flood events. The National Centers for Environmental Information reported a total of 243 events throughout the Cabarrus Stanly Union Region since 1993[41]. A summary of these events is presented in **Table 5.29**. These events accounted for over $24.1 million (2023 dollars) in property damage throughout the region[42].

TABLE 5.29: SUMMARY OF FLOOD OCCURRENCES

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Cabarrus County	**80**	**1/4**	**$18,708,423**
Concord	7	0/0	$70,093
Harrisburg	7	0/0	$87,918
Kannapolis	8	0/0	$1,754,791

[41] These events (flooding and flash flooding) are only inclusive of those reported by NCEI. It is likely that additional occurrences have occurred and have gone unreported.

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Midland	1	0/0	$6,484
Mount Pleasant	3	0/0	$16,698
Unincorporated Area	54	1/4	$16,772,439
Stanly County	**86**	**5/0**	**$4,774,462**
Albemarle	31	0/0	$0
Badin	0	0/0	$0
Locust	2	0/0	$0
Misenhiemer	1	0/0	$0
New London	0	0/0	$0
Norwood	5	0/0	$4,410,919
Oakboro	5	0/0	$0
Red Cross	2	0/0	$0
Richfield	6	0/0	$35,127
Stanfield	4	0/0	$0
Unincorporated Area	30	5/0	$328,416
Union County	**77**	**3/0**	**$652,278**
Fairview	5	0/0	$20,053
Hemby Bridge	0	0/0	$0
Indian Trail	14	0/0	$99,107
Lake Park	0	0/0	$0
Marshville	1	0/0	$0
Marvin	1	0/0	$1,179
Mineral Springs	1	0/0	$28,002
Monroe	20	0/0	$15,223
Stallings	1	0/0	$0
Unionville	1	0/0	$0
Waxhaw	2	0/0	$168,264
Weddington	2	0/0	$35,819
Wesley Chapel	2	0/0	$30,832
Wingate	5	0/0	$6,266
Unincorporated Area	22	3/0	$247,533
Cabarrus Stanly Union Regional Total	**243**	**9/4**	**$24,135,163**

Source: National Centers for Environmental Information

5.11.4 Historical Summary of Insured Flood Losses

According to FEMA flood insurance policy records as of February 2024, there have been 340 flood losses reported in the Cabarrus Stanly Union Region through the National Flood Insurance Program (NFIP) since 1978, totaling over $7.51 million in claims payments (2024 dollars). A summary of these figures for each county is provided in **Table 5.30**. It should be emphasized that these numbers include only those losses to structures that were insured through the NFIP policies, and for losses in which claims were sought and received. It is likely that many additional instances of flood loss in the Cabarrus Stanly Union Region were either uninsured, denied claims payment, or not reported.

TABLE 5.30: SUMMARY OF INSURED FLOOD LOSSES

Location	Flood Losses	Claims Payments
Cabarrus County	**207**	**$3,488,693.38**
Concord	29	$272,038.47
Harrisburg	64	$1,171,775.86
Kannapolis	0	$0
Midland	2	$8,397.28
Mount Pleasant	1	$39,671.97
Unincorporated Area	111	$1,996,809.80
Stanly County	**60**	**$2,724,247.53**
Albemarle	48	$2,625,883.15
Badin	1	$0
Locust	0	$0
Misenhiemer	0	$0
New London	0	$0
Norwood	3	$25,932.83
Oakboro	0	$0
Red Cross	0	$0
Richfield	0	$0
Stanfield	0	$0
Unincorporated Area	8	$72,431.55
Union County	**73**	**$1,296,391.18**
Fairview	3	$48,902.71
Hemby Bridge	1	$0
Indian Trail	16	$124,679.23
Lake Park	0	$0
Marshville	0	$0
Marvin	1	$0
Mineral Springs	0	$0
Monroe	7	$32,303.79
Stallings	3	$97,439.30
Unionville	7	$244,062.13
Waxhaw	0	$0
Weddington	1	$3,553.90
Wesley Chapel	5	$426,098.35
Wingate	0	$0
Unincorporated Area	29	$319,351.77
Cabarrus Stanly Union Regional Total	**340**	**$7,509,332.09**

Source: Federal Emergency Management Agency, National Flood Insurance Program

5.11.5 Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently there are over 150,000 repetitive loss properties nationwide. A severe repetitive loss property is any insurable building for which four or more claims of more than $5,000 were paid by the NFIP, where at least two of the claims are made within 10 years of each other.

Currently (as of February 2024 records), there are 39 non-mitigated repetitive loss properties located in the Cabarrus Stanly Union Region (plus 2 mitigated), which accounted for 140 losses (with over $2.2

million in claims payments last recorded across 24 properties and 71 losses in 2013). Many of the 41 properties are single-family residential buildings (30) and the remaining are other residential, commercial, or government-owned buildings. Additionally, 7 of the properties (all in Cabarrus County) are considered severe repetitive loss properties. Without mitigation these properties will likely continue to experience flood losses. **Table 5.31** presents a summary of these figures for the Cabarrus Stanly Union Region.

TABLE 5.31: SUMMARY OF REPETITIVE LOSS PROPERTIES

Location	Number of Properties	Number of Losses
Cabarrus County	**26**	**93**
Concord	3	8
Harrisburg	7	31
Kannapolis	3	7
Midland	0	0
Mount Pleasant	0	0
Unincorporated Area	13	47
Stanly County	**8**	**26**
Albemarle	7	23
Badin	0	0
Locust	0	0
Misenhiemer	0	0
New London	0	0
Norwood	0	0
Oakboro	0	0
Red Cross	0	0
Richfield	0	0
Stanfield	0	0
Unincorporated Area	1	3
Union County	**7**	**21**
Fairview	0	0
Hemby Bridge	0	0
Indian Trail	1	3
Lake Park	0	0
Marshville	0	0
Marvin	0	0
Mineral Springs	0	0
Monroe	1	2
Stallings	1	3
Unionville	1	3
Waxhaw	0	0
Weddington	0	0
Wesley Chapel	1	3
Wingate	0	0
Unincorporated Area	2	7
CABARRUS STANLY UNION REGION TOTAL	**41**	**140**

Source: National Flood Insurance Program

5.11.6 Changing Future Conditions

A changing climatic environment translates to new weather patterns, stronger storms, and significant shifts in rainfall which can all exacerbate flood risks across different regions. The North Carolina Climate

Science Report notes that there is an upward trend in the number of heavy rainfall events (3 inches or more per day), with the last four years (2015-2018) demonstrating the greatest number of events since 1900. A warmer atmosphere also contributes to increased evaporation and greater water availability when it rains. Current projections in the report indicate it is likely that annual total precipitation in North Carolina will increase and very likely for extreme precipitation frequency and intensity due to related increases in atmospheric water vapor content. Additionally, greater intensity and frequency of flooding could also present a variety of extreme public health and emergency management challenges.

5.11.7 Probability of Future Occurrences

Flood events will remain a threat in the Cabarrus Stanly Union Region, especially among recognized floodplains or Special Flood Hazard Areas (SFHAs), and the probability of future occurrences will remain likely (between 10 and 100 percent annual probability). The probability of future flood events based on magnitude and according to best available data is illustrated in the figures above**,** which indicates those areas susceptible to the 1-percent annual chance flood (100-year floodplain) and the 0.2-percent annual chance flood (500-year floodplain). As of 2024, the FEMA National Risk Index rates the riverine flooding hazard as “relatively low” across Cabarrus County, Stanly County, and Union County.

5.12 WILDFIRES

5.12.1 Background and Description

A wildfire is any outdoor fire (i.e. grassland, forest, brush land) that is not under control, supervised, or prescribed[43]. Wildfires are part of the natural management of forest ecosystems, but may also be caused by human factors.

Nationally, over 80 percent of forest fires are started by negligent human behavior such as smoking in wooded areas or improperly extinguishing campfires. The second most common cause for wildfire is lightning. In North Carolina, a majority of fires are caused by debris burning.

There are three classes of wildland fires: surface fire, ground fire, and crown fire. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees. Wildfires are usually signaled by dense smoke that fills the area for miles around.

Wildfire probability depends on local weather conditions, outdoor activities such as camping, debris burning, and construction, and the degree of public cooperation with fire prevention measures. Drought conditions and other natural hazards (such as tornadoes, hurricanes, etc.) increase the probability of wildfires by producing fuel in both urban and rural settings.

Many individual homes and cabins, subdivisions, resorts, recreational areas, organizational camps, businesses, and industries are located within high wildfire hazard areas. Furthermore, the increasing demand for outdoor recreation places more people in wildlands during holidays, weekends, and vacation periods. Unfortunately, wildland residents and visitors are rarely educated or prepared for wildfire events that can sweep through the brush and timber and destroy property within minutes.

Wildfires can result in severe economic losses as well. Businesses that depend on timber, such as paper mills and lumber companies, experience losses that are often passed along to consumers through higher prices and sometimes jobs are lost. The high cost of responding to and recovering from wildfires can deplete state resources and increase insurance rates. The economic impact of wildfires can also be felt in the tourism industry if roads and tourist attractions are closed due to health and safety concerns.

State and local governments can impose fire safety regulations on home sites and developments to help curb wildfire. Land treatment measures such as fire access roads, water storage, helipads, safety zones, buffers, firebreaks, fuel breaks, and fuel management can be designed as part of an overall fire defense system to aid in fire control. Fuel management, prescribed burning, and cooperative land management planning can also be encouraged to reduce fire hazards.

5.12.2 Location and Spatial Extent

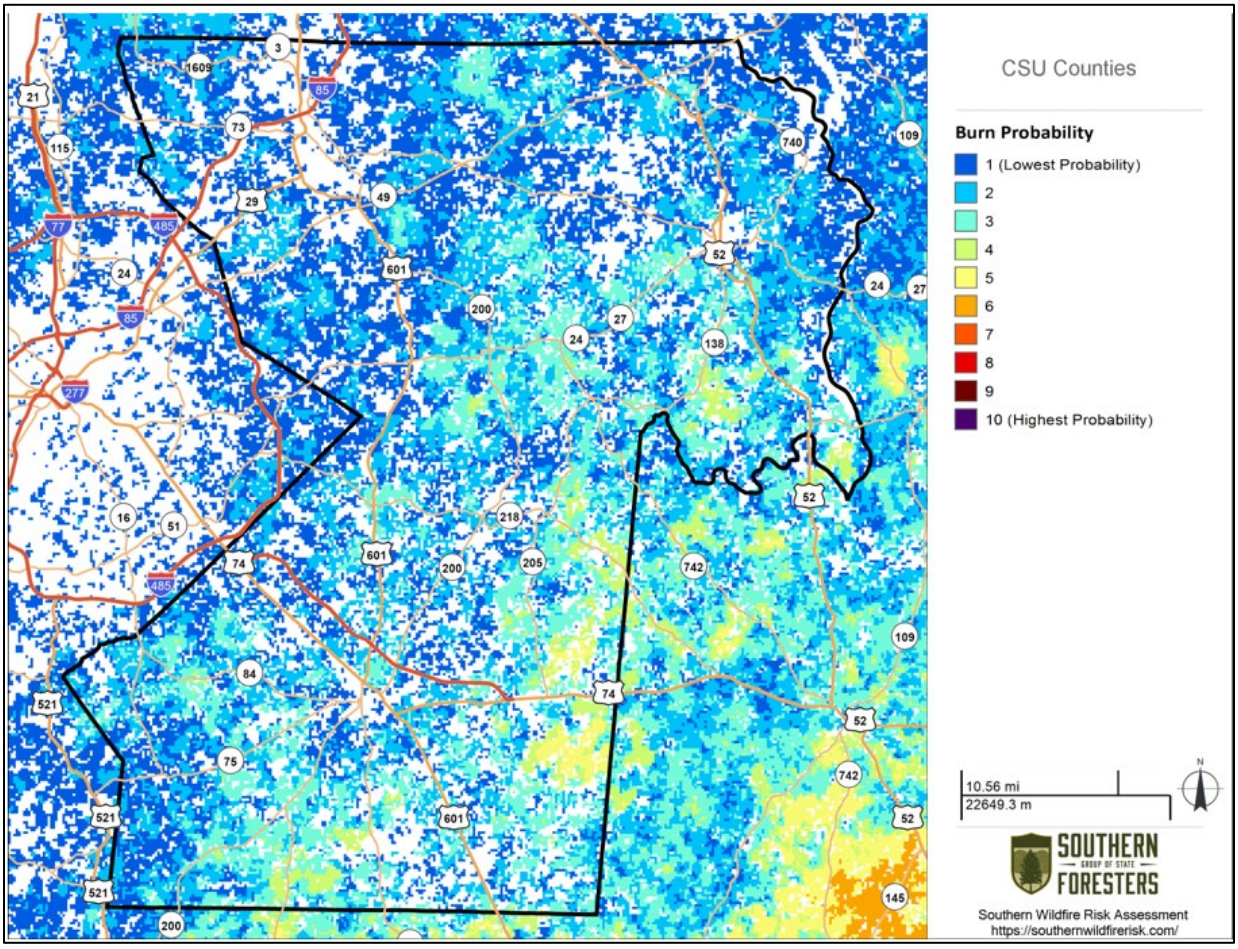
The entire region is at risk of a wildfire occurrence. Wildfire risk maps for each jurisdiction in the region can be viewed in **Appendix G**. However, several factors such as drought conditions or high levels of fuel on the forest floor, may make a wildfire more likely. Furthermore, areas in the

[43] Prescription burning, or "controlled burn," undertaken by land management agencies is the process of igniting fires under selected conditions, in accordance with strict parameters.

wildland urban interface (WUI) are particularly susceptible to fire hazard as populations border formerly undeveloped areas.

Figure 5.19 shows the burn probability in the Cabarrus Stanly Union Region based on data from the Southern Wildfire Risk Assessment. This data represents the likelihood of an area burning based on landscape conditions, percentile weather, historical ignition patterns, and historical fire suppression efforts.

FIGURE 5.19: BURN PROBABILITY IN THE CABARRUS STANLY UNION REGION

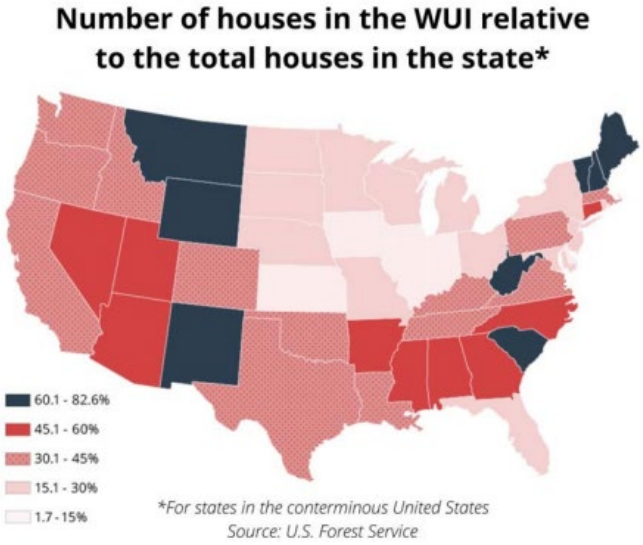


Source: Southern Wildfire Risk Assessment

Every state also has a Wildland Urban Interface (WUI), which is the rating of potential impact of wildfires on people and their homes. The WUI is not a fixed geographical location, but rather a combination of human development and vegetation where wildfires have the greatest potential to result in negative impacts. Nationally, one-third of all homes lie in the WUI, which is a growing danger. Below, **Figure 5.20** shows a map of each state's share of houses in the WUI as of 2022. According to the U.S. Fire Administration, the states with the greatest number of houses in the WUI include California, Texas, Florida, North Carolina, and Pennsylvania[44]. Based on past data from the US Department of Agriculture, approximately 52% of homes in North Carolina lie within the WUI.

[44] U.S. Fire Administration (https://www.usfa.fema.gov/downloads/pdf/publications/wui-issues-resolutions-report.pdf)

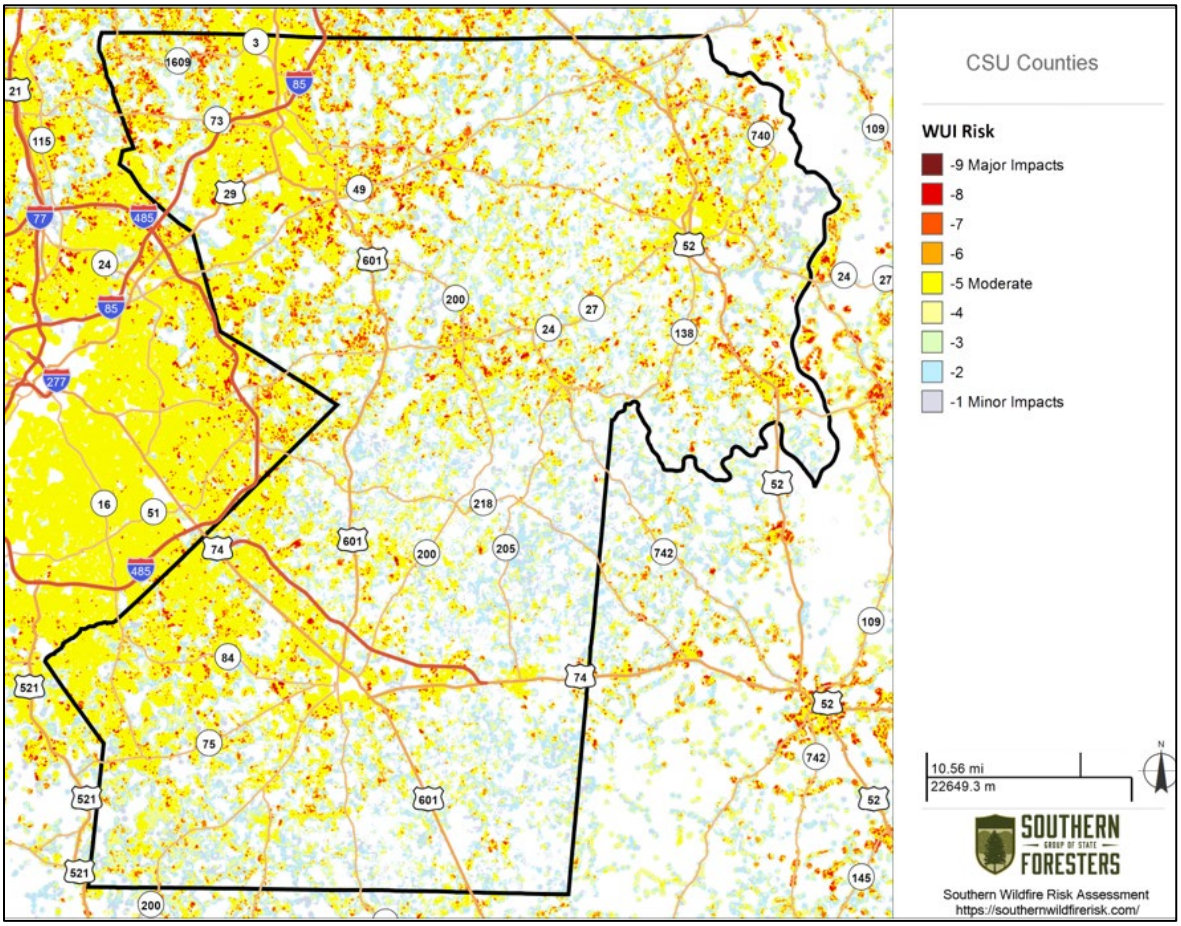
FIGURE 5.20: PERCENT OF TOTAL HOMES IN THE WILDLAND URBAN INTERFACE (2022)



Source: US Fire Administration

Below, **Figure 5.21** displays the WUI Risk Index specifically for the Cabarrus Stanly Union Region.

FIGURE 5.21: WILDLAND URBAN INTERFACE RISK INDEX



Source: Southern Wildfire Risk Assessment

Based on data from the North Carolina Division of Forest Resources from 2003 to 2018, the Cabarrus Stanly Union Region experiences an average of 188 wildfires annually which burn a combined 185 acres, on average. The data indicates that most of these fires are small, averaging about one acre per fire. Although it is certain that wildfires have occurred in the region, NCEI reports that none have taken place in recent history. Additionally, the 2020 North Carolina Forest Action Plan notes that each county in the region experiences between 40 to 80 wildfires each year based on average rates of occurrence from 2010 to 2020.

5.12.3 Historical Occurrences

Information from the National Association of State Foresters through 2018 was used to ascertain historical wildfire events. The National Association of State Foresters reported that a total of 701 events that impacted an area greater than 1 acre have occurred throughout the Cabarrus Stanly Union Region since 2001[45]. A summary of these events is presented in **Table 5.32**. The largest of these events was the Morrow Mountain Easter Fire which occurred in Stanly County in 2010 and impacted 100 acres.

TABLE 5.32: SUMMARY OF WILDFIRE EVENTS

Location	Number of Events	Number of Acres Impacted
Cabarrus County	**98**	**315.69**
Concord	8	22.4
Harrisburg	3	11.1
Kannapolis	4	11.77
Midland	10	24.9
Mount Pleasant	0	0
Unincorporated Area	73	245.52
Stanly County	**321**	**1051.89**
Albemarle	7	29
Badin	2	13
Locust	11	73.4
Misenhiemer	2	16.96
New London	0	0
Norwood	6	7
Oakboro	0	0
Red Cross	1	1.81
Richfield	0	0
Stanfield	6	15
Unincorporated Area	286	895.72
Union County	**282**	**1016.31**
Fairview	9	22.5
Hemby Bridge	1	1.5
Indian Trail	17	133.71
Lake Park	2	2.5
Marshville	1	5
Marvin	0	0
Mineral Springs	5	10.5

[45] These events are only inclusive of those reported by NASFI. It is likely that additional occurrences have occurred and have gone unreported.

Location	Number of Events	Number of Acres Impacted
Monroe	6	14.18
Stallings	4	9
Unionville	6	33.4
Waxhaw	5	8.2
Weddington	9	12.44
Wesley Chapel	3	15.98
Wingate	0	0
Unincorporated Area	214	747.4
CABARRUS STANLY UNION REGION TOTAL	**701**	**2383.89**

Source: National Association of State Foresters

Other than the Morrow Mountain Easter Fire in 2010 that did not impact any buildings or cause loss of life, there is lacking narrative information on historical wildfires to impact the Cabarrus Stanly Union Region found in the NCEI database, the NC State Hazard Mitigation Plan, the North Carolina Forest Service or provided by local emergency managers. The main causes of previous wildfires in the Region are from debris burning (38%) and incendiary causes (20%) but they are generally smaller fires that are controlled before causing major damages.

5.12.4 Changing Future Conditions

According to the 2020 North Carolina Forest Action Plan, the state has experienced 41,551 wildfires burning a combined total of over 399,125 acres since 2010. The cost of wildfire response, WUI acreage, fuel loading related to fire exclusion and plant mortality, and climate change stressors are also all increasing in the context of growing wildfire risks[46].

Although wildfires occur naturally and play a long-term role in the health of ecosystems, changing wildfire and climate patterns threaten to upset the status quo conditions of future seasons. The wildfire season has lengthened in many areas due to factors including warmer springs, longer summer dry seasons, and drier soils and vegetation. For instance, according to the USDA Forest Service during the 2016 fire season, 320 (100+ acre) large fires burned more than 325,000 acres of forestland across the Southeast from October to December. Of increasing concern is the threat wildfires pose to homes and lives throughout North Carolina.

5.12.4 Probability of Future Occurrences

Wildfire events will be an ongoing occurrence in the Cabarrus Stanly Union Region. The likelihood of wildfires increases during drought cycles and abnormally dry conditions. Fires are likely to stay small in size but could increase due to local climate and ground conditions. Dry, windy conditions with an accumulation of forest floor fuel (potentially due to ice storms or lack of fire) could create conditions for a large fire that spreads quickly. It should also be noted that some areas do vary somewhat in risk. For example, highly developed areas are less susceptible unless they are located near the urban-wildland boundary. The risk will also vary due to assets. Areas in the urban-wildland interface will have much more property at risk, resulting in increased vulnerability and need to mitigate compared to rural, mainly forested areas. The probability assigned to the Cabarrus Stanly Union Region for future wildfire events is likely (10 to 100 percent annual probability). As of 2024, the FEMA National Risk Index rates the wildfire hazard as “very low” across Cabarrus County, Stanly County, and Union County.

[46] North Carolina Forest Action Plan (https://www.stateforesters.org/districts/north-carolina/)

5.13 INFECTIOUS DISEASE

5.13.1 Background and Description

For the purposes of this plan, this section will assess infectious diseases, vector-borne diseases, and foreign animal diseases within the Cabarrus Stanly Union Region.

Infectious Disease

Communicable, or infectious, diseases are conditions that result in clinically evident illness which are transmissible directly from one person to another or indirectly through vectors such as insects, air, water, blood, or other objects. The impact of communicable disease can range from the mild effects of the common cold to the extreme lethality of pneumonic plague or anthrax. The public health system in the United States was developed in large part as a response to the often urgent need to respond to or prevent outbreaks of communicable diseases. Through public health methods of disease reporting, vaccinations, vector control, and effective treatments, most communicable diseases are well controlled in the United States and across the Cabarrus Stanly Union Region. However, control systems can fail and when people come together from locations outside of the state, outbreaks can occur, even in the most modern of communities. In this section, some of the more significant potential communicable disease concerns are described.

The threats discussed in this section usually do not occur on a regular basis, though some are more frequent. The diseases described herein do not originate from intentional exposure (such as through terrorist actions) but do present significant issues and concerns for the public health community. There are numerous infectious diseases that rarely, if ever, occur in the State of North Carolina, such as botulism or bubonic plague. Some highly dangerous diseases which could potentially be used as biological weapons, such as anthrax, pneumonic plague, and smallpox, are safely housed and controlled in laboratory settings such as at the Center for Disease Control and Prevention (CDC). Other diseases have not (yet) mutated into a form that can infect humans, or otherwise lie dormant in nature.

There have been several significant viral outbreaks from emerging diseases in recent years of both national and international importance. The Zika virus and West Nile virus are viruses that are typically passed to humans or animals by mosquitoes and made major news as emergent disease threats. Meanwhile, diseases that are spread directly between human beings such as Severe Acute Respiratory Syndrome (SARS) and Ebola have also been identified as serious threats. While each of these conditions caused a great deal of public health concern when they were first identified, SARS has virtually disappeared, West Nile virus occurs with low frequency and causes serious disease in only a very small percentage of cases, Ebola has been more or less contained and a vaccine is in development, and many people infected with Zika will not experience symptoms from the disease.

Other communicable diseases pose a much more frequent threat to the citizens of the region. Some of the infectious diseases of greatest concern include coronavirus, influenza, particularly in a pandemic form, as well as norovirus, and multiple antibiotic-resistant superbugs. Even in one of its normal year-to-year variants, influenza (commonly referred to as “flu”) can result in serious illness and even death in young children, the elderly and immune-compromised persons. But there is always the potential risk of the emergence of influenza in one of the pandemic H1N1 forms, such as in the “Spanish Flu” outbreak of 1918-19, which killed over 50 million people worldwide. Every year, North Carolina sees hundreds of cases of influenza, leading to hundreds of hours of lost productivity in businesses due to sick employees. Of note, a vaccine for influenza is produced every year and, according to the CDC, is highly effective in preventing the disease.

Norovirus is recognized as the leading cause of foodborne-disease outbreaks in the United States. The virus can cause diarrhea, vomiting, and stomach pain, and is easily spread from person to person through contaminated food or water and by surface-to-surface contact. Especially vulnerable populations to this virus include those living or staying in nursing homes and assisted living facilities and other healthcare facilities such as hospitals. Norovirus could also be a threat in the event of large public gatherings such as sporting events, concerts, festivals, and so forth. North Carolina often experiences norovirus outbreaks on an annual basis. No vaccine or treatment exists for the Norovirus, making it especially dangerous for the public in the event of an outbreak.

Additionally, the recent and ongoing global pandemic caused by the SARS-related coronavirus, COVID-19 (Severe Acute Respiratory Syndrome Coronavirus 2 or SARS-CoV-2), has persisted for multiple years resulting in over 774 million reported cases and over 7 million deaths worldwide as of 2024 according to the World Health Organization. The disease spread rapidly following its initial discovery in 2019, eventually leading to the broader COVID-19 pandemic on a global scale. The contagious virus spreads between people through contaminated respiratory droplets and other airborne particles. Its evolving nature and high transmission rates continue to pose a significant threat.

Vector-Borne Diseases

Bacterial, viral, and parasitic diseases that are transmitted by mosquitoes, ticks and fleas are collectively called "vector-borne diseases" (the insects and arthropods are the "vectors" that carry the diseases). Although the term "vector" can also apply to other carriers of disease — such as mammals that can transmit rabies or rodents that can transmit hantavirus — those diseases are generally called zoonotic (animal-borne) diseases.

The most common vector-borne diseases found in North Carolina and the Cabarrus Stanly Union Region are carried by ticks and mosquitoes. The tick-borne illnesses most often seen in the state are Rocky Mountain Spotted Fever, ehrlichiosis, Lyme disease and Southern Tick-Associated Rash Illness (STARI). The most frequent mosquito-borne illnesses, or "arboviruses," in North Carolina include La Crosse encephalitis, West Nile virus and Eastern equine encephalitis. An outbreak of the West Nile Virus began showing up in the United States in 1999, with North Carolina reporting 63 cases from that time through the end of 2016.

Foreign Animal Diseases

As defined in the 2023 State Hazard Mitigation Plan, Foreign Animal Disease (FAD) is recognized as an animal disease or pest not known to exist in a country of interest (e.g., United States) or any of its associated territories. A FAD in the United States, and specifically North Carolina, could prove to be extremely detrimental to agricultural producers and general public health if it manages to spread over a large area. The North Carolina Department of Agriculture and Consumer Services (NCDA&CS) is designated to lead a statewide response in the event of a potential FAD outbreak. There are several diseases of future clinical significance in North Carolina: African swine fever, Dourine, contagious bovine pleuropneumonia (CBPP), foot and mouth disease (FMD), highly pathogenic avian influenza (HPAI), and Glanders among other emerging pathogens.

Public health threats can occur at any time and can have varying impacts. Discussions between public health professionals, planning officials, and first response agencies are essential in order to facilitate safe, effective, and collaborative efforts toward outbreaks.

5.13.2 Location and Spatial Extent

Extent is difficult to measure for an infectious disease event as the extent is largely dependent on the type of disease and on the effect that it has on the population (discussed above). Extent can be somewhat defined by the number of people impacted, which depending on the type of disease could number in the tens of thousands within the state.

5.13.3 Historical Occurrences

Infectious Disease

Influenza is historically the most common infectious disease that has occurred in the Cabarrus Stanly Union region. Cases of the flu tend to occur in the late fall and early winter months. In recent years, substantial cases of influenza and influenza-like illnesses have been reported in hospitals. According to the North Carolina Department of Health and Human Services (NCDHHS), there were over 30,000 positive tests and 196 influenza-associated deaths during the 2022-2023 influenza season[47]. The Cabarrus Stanly Union Region is part of Flu Surveillance Region 7 (see regional map in NCDHHS annual surveillance summaries) in the state, with 2-6% of influenza-like illnesses reported among total emergency department visits during the season. The primary respiratory viruses treated during the 2022-2023 season included influenza and SARS-CoV-2 (COVID-19).

A COVID-19 Pandemic disaster declaration was declared for North Carolina on March 25, 2020, with an incident period of over 3 years. Between March 7, 2020, and May 10, 2023, NCDHHS reported 3,501,404 total cases and 29,059 total deaths due to COVID-19 statewide. This included over 72,938 total cases and 576 total deaths in Cabarrus County, 24,238 total cases and 292 total deaths in Stanly County, and 80,144 total cases and 542 total deaths in Union County.

Vector-Borne Diseases

In 2016, North Carolina state health officials encouraged citizens to take preventative measures against mosquito bites to avoid contracting the Zika virus. Over $477,500 was allocated from the Governor's yearly budget to develop an infrastructure to detect, prevent, control, and respond to the Zika virus and other vector-borne illnesses[48]. More recently, state officials have encouraged citizens to "Fight the Bite" against both mosquito and tick bites to avoid serious vector-borne diseases after nearly 700 cases were reported in 2022[49].

Foreign Animal Diseases

No significant cases have been reported in the region.

5.13.4 Changing Future Conditions

According to the Centers for Disease Control and Prevention (CDC), ongoing climate change trends of milder winters, warmer summers, and fewer days of frost make it easier for infectious diseases and vector diseases to expand to new geographic areas and infect more people. Between 2004 and 2018, the number of reported illnesses from mosquito, tick, and flea bites more than doubled, with more than 760,000 cases reported in the United States. Additionally, nine new germs spread by mosquitoes and

[47] NCDHHS Respiratory Disease Surveillance Summaries (https://flu.ncdhhs.gov/data.htm)

[48] NCDHHS Press Release, August 2016 (https://www.ncdhhs.gov/news/press-releases/nc-prepared-zika-virus-risk-local-virus-carrying-mosquitoes-low)

[49] NCDHHS Press Release, March 2023 (https://www.ncdhhs.gov/news/press-releases/2023/03/30/ncdhhs-urges-north-carolinians-fight-bite-insect-repellant-and-other-prevention-tools-avoid-tick-and)

ticks were discovered or introduced into the United States during this time. In 2012, a mild winter, early spring, and a hot summer also set the stage for an outbreak of West Nile Virus disease in the United States, resulting in more than 5,600 illnesses and 286 deaths[50].

5.13.5 Probability of Future Occurrence

It is difficult to predict the future probability of infectious diseases due to the difficulty of obtaining information on this type of hazard. Regardless of this difficulty, current events surrounding the recent COVID-19 pandemic and other emerging infectious diseases have highlighted an important need for local, state, and federal agencies to closely monitor these hazards in the future. The most common and probable disease in the state has shown to be influenza; however, based on historical data, it is likely (between 10 and 100 percent annual probability) that the Cabarrus Stanly Union Region could experience an outbreak of any number of infectious diseases in the future.

[50] CDC National Center for Emerging and Zoonotic Infectious Disease (NCEZID) (https://www.cdc.gov/ncezid/priorities/climate-infectious-disease.html)

Technological Hazards

5.14 HAZARDOUS SUBSTANCES

5.14.1 Background and Description

Hazardous materials can be found in many forms and quantities that can potentially cause death; serious injury; long-lasting health effects; and damage to buildings, homes, and other property in varying degrees. Such materials are routinely used and stored in many homes and businesses and are also shipped daily on the nation's highways, railroads, waterways, and pipelines. This subsection on the hazardous material hazard is intended to provide a general overview of the hazard, and the threshold for identifying fixed and mobile sources of hazardous materials is limited to general information on rail, highway, and FEMA-identified fixed HAZMAT sites determined to be of greatest significance as appropriate for the purposes of this plan.

Hazardous material (HAZMAT) incidents can apply to fixed facilities as well as mobile, transportation related accidents in the air, by rail, on the nation's highways, and on the water. Approximately 6,774 HAZMAT events occur each year, 5,517 of which are highway incidents, 991 are railroad incidents, and 266 are due to other causes[51]. In essence, HAZMAT incidents consist of solid, liquid, and/or gaseous contaminants that are released from fixed or mobile containers, whether by accident or by design as with an intentional terrorist attack. A HAZMAT incident can last hours to days, while some chemicals can be corrosive or otherwise damaging over longer periods of time. In addition to the primary release, explosions and/or fires can result from a release, and contaminants can be extended beyond the initial area by persons, vehicles, water, wind, and possibly wildlife as well.

HAZMAT incidents can also occur as a result of or in tandem with natural hazard events, such as floods, hurricanes, tornadoes, and earthquakes, which in addition to causing incidents can also hinder response efforts. In the case of Hurricane Floyd in September 1999, communities along the Eastern United States were faced with flooded junkyards, disturbed cemeteries, deceased livestock, floating propane tanks, uncontrolled fertilizer spills, and a variety of other environmental pollutants that caused widespread toxicological concern.

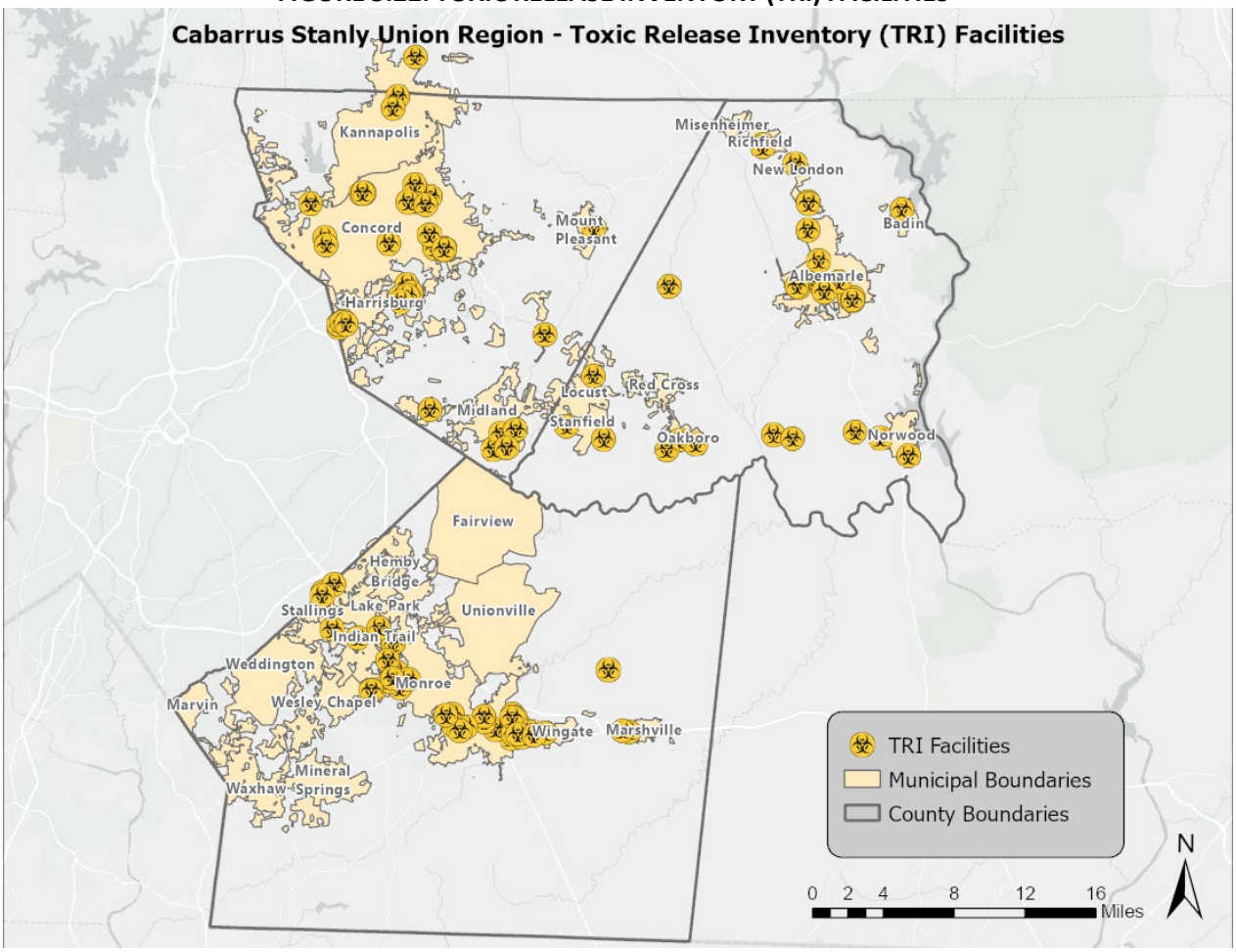
Hazardous material incidents can include the spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of a hazardous material, but exclude: (1) any release which results in exposure to poisons solely within the workplace with respect to claims which such persons may assert against the employer of such persons; (2) emissions from the engine exhaust of a motor vehicle, rolling stock, aircraft, vessel, or pipeline pumping station engine; (3) release of source, byproduct, or special nuclear material from a nuclear incident; and (4) the normal application of fertilizer.

5.14.2 Location and Spatial Extent

As a result of the 1986 Emergency Planning and Community Right to Know Act (EPCRA), the Environmental Protection Agency (EPA) provides public information on hazardous materials. One facet of this program is to collect information from industrial facilities on the releases and transfers of certain toxic agents. This information is then reported in the Toxic Release Inventory (TRI). TRI sites indicate where such activity is occurring. As of 2023, the Cabarrus Stanly Union Region has 112 reported TRI facilitates. These sites are shown in **Figure 5.22.**

[51] FEMA, 1997.

FIGURE 5.22: TOXIC RELEASE INVENTORY (TRI) FACILITIES



Source: Environmental Protection Agency

In addition to "fixed" hazardous materials locations, hazardous materials may also impact the region via roadways and rail. Many roads in the region are narrow or winding, making hazardous material transport in the area treacherous. All roads that permit hazardous material transport are considered potentially at risk of an incident.

5.14.3 Historical Occurrences

The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) lists historical occurrences throughout the nation. A "serious incident" is a hazardous materials incident that involves:

- a fatality or major injury caused by the release of a hazardous material,
- the evacuation of 25 or more persons as a result of release of a hazardous material or exposure to fire,
- a release or exposure to fire which results in the closure of a major transportation artery,
- the alteration of an aircraft flight plan or operation,
- the release of radioactive materials from Type B packaging,

- the release of over 11.9 galls or 88.2 pounds of a severe marine pollutant, or
- the release of a bulk quantity (over 199 gallons or 882 pounds) of a hazardous material.

However, prior to 2002, a hazardous material "serious incident" was defined as follows:

- a fatality or major injury due to a hazardous material,
- closure of a major transportation artery or facility or evacuation of six or more person due to the presence of hazardous material, or
- a vehicle accident or derailment resulting in the release of a hazardous material.

Table 5.33 summarizes the serious HAZMAT incidents reported in the Cabarrus Stanly Union Region.

TABLE 5.33: SUMMARY OF HAZMAT INCIDENTS

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2024)
Cabarrus County	**8**	**0/0**	**$5,000**
Concord	4	0/0	$0
Harrisburg	2	0/0	$0
Kannapolis	0	0/0	$0
Midland	1	0/0	$5,000
Mount Pleasant	1	0/0	$0
Unincorporated Area	0	0/0	$0
Stanly County	**2**	**0/0**	**$0**
Albemarle	0	0/0	$0
Badin	1	0/0	$0
Locust	0	0/0	$0
Misenhiemer	0	0/0	$0
New London	0	0/0	$0
Norwood	1	0/0	$0
Oakboro	0	0/0	$0
Red Cross	0	0/0	$0
Richfield	0	0/0	$0
Stanfield	0	0/0	$0
Unincorporated Area	0	0/0	$0
Union County	**3**	**0/2**	**$5,000**
Fairview	0	0/0	$0
Hemby Bridge	0	0/0	$0
Indian Trail	0	0/0	$0
Lake Park	0	0/0	$0
Marshville	1	0/0	$0
Marvin	0	0/0	$0
Mineral Springs	0	0/0	$0
Monroe	1	0/2	$5,000
Stallings	0	0/0	$0
Unionville	1	0/0	$0
Waxhaw	0	0/0	$0
Weddington	0	0/0	$0
Wesley Chapel	0	0/0	$0

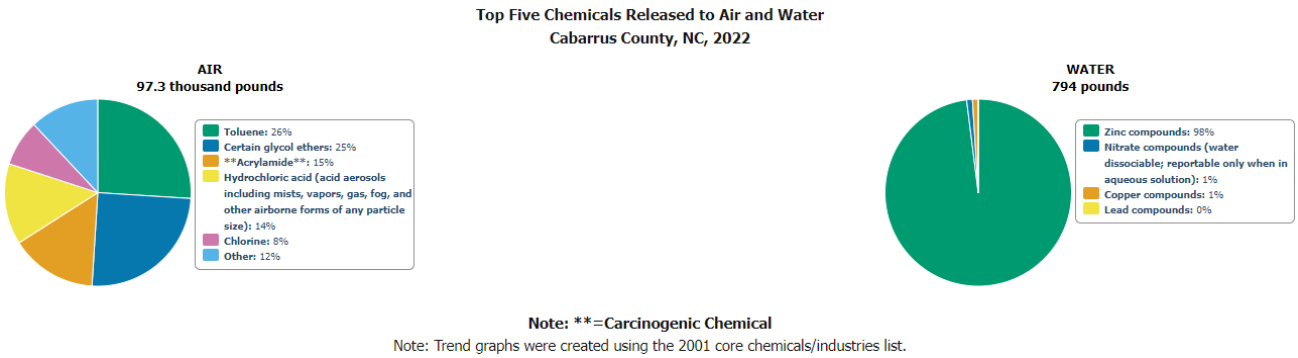
Location	Number of Occurrences	Deaths / Injuries	Property Damage (2024)
Wingate	0	0/0	$0
Unincorporated Area	0	0/0	$0
Cabarrus Stanly Union Regional Total	**13**	**0/2**	**$10,000**

Source: U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration

Updated information regarding county-specific chemical releases have been provided through 2021 and TRI facilities through 2023 by the EPA[52]. In Cabarrus County, there are 39 reported TRI facilities. Releases have mostly been conducted through off-site disposal with a smaller share of air and land releases. Stanly County has 30 reported TRI facilities. Nearly all releases have been conducted through off-site disposal. Union County has 43 reported TRI facilities. Most releases have been conducted through air with a smaller share of off-site disposals.

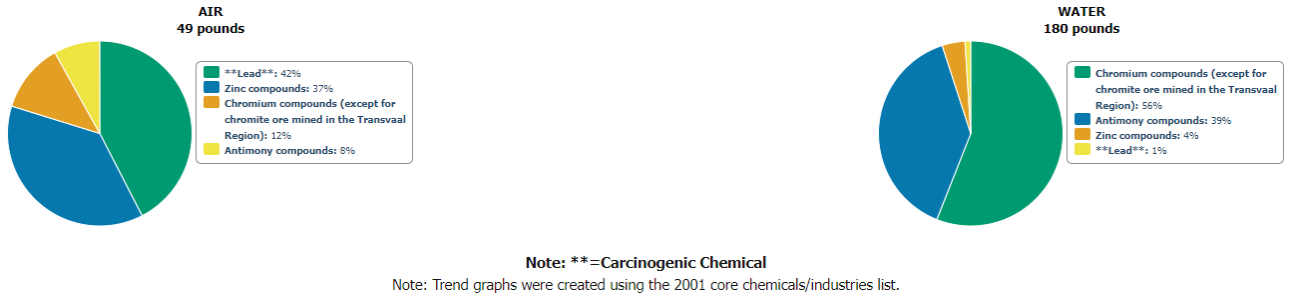
In the following three figures, the top five chemicals released through air and water are shown for each of the counties in the region.

FIGURE 5.23: CHEMICALS RELEASED IN CABARRUS COUNTY



Source: Environmental Protection Agency

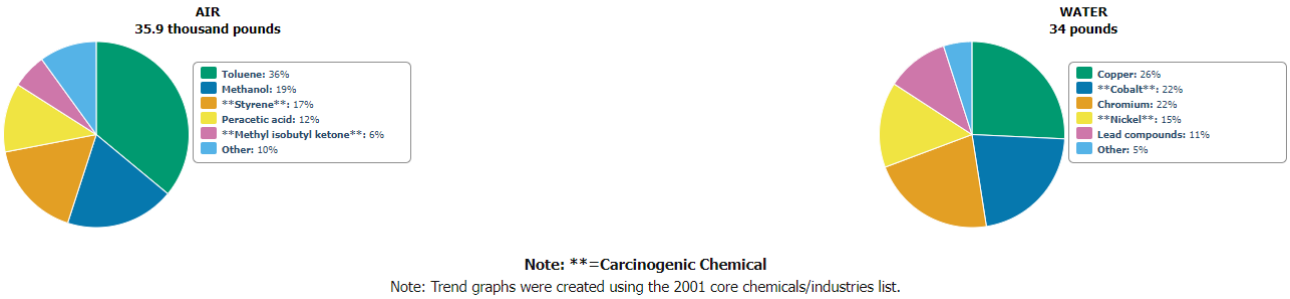
FIGURE 5.24: CHEMICALS RELEASED IN STANLY COUNTY



Source: Environmental Protection Agency

[52] EPA TRI National Analysis Where You Live Tool (https://www.epa.gov/trinationalanalysis/where-you-live) and EPA TRI Envirofacts (https://www.epa.gov/enviro/tri-search?)

FIGURE 5.25: CHEMICALS RELEASED IN UNION COUNTY



Source: Environmental Protection Agency

5.14.4 Changing Future Conditions

As the population of the Cabarrus Stanly Union Region continues to grow, more people could become increasingly vulnerable to incidents involving hazardous substances. Therefore, it is important to monitor all transportation routes and continue to attempt to prevent future incidents from occurring through ongoing preparedness, monitoring, and training. Unlike other hazards discussed in this plan, climate change is unlikely to affect the occurrence or frequency of future hazardous substance events.

5.14.5 Probability of Future Occurrence

As of 2024, 112 toxic release inventory sites are located in the Cabarrus Stanly Union Region. Given the location of these sites and several roadway, rail, and air incidents, it is likely that a hazardous material incident may occur in the region (between 10 and 100 percent annual probability). County and municipal officials are mindful of this possibility and take precautions to prevent such an event from occurring. Furthermore, there are detailed plans in place to respond to an occurrence.

5.15 RADIOLOGICAL EMERGENCY – FIXED NUCLEAR FACILITIES

5.15.1 Background and Description

A nuclear and radiation accident is defined by the International Atomic Energy Agency as "an event that has led to significant consequences to people, the environment or the facility. Often, this type of incident results from damage to the reactor core of a nuclear power plant which can release radioactivity into the environment. The degree of exposure from nuclear accidents has varied from serious to catastrophic. While radiological emergencies generally are a rare occurrence, many incidents are extremely well known due to their large-scale impact and serious effects on people and the environment.

McGuire Nuclear Station, which is the plant located closest to the Cabarrus Stanly Union Region, is a 2,258-megawatt power plant that began commercial operation in 1981. It uses uranium dioxide fuel, and its reactor is a pressurized water reactor. The plant operates with a very high level of security.

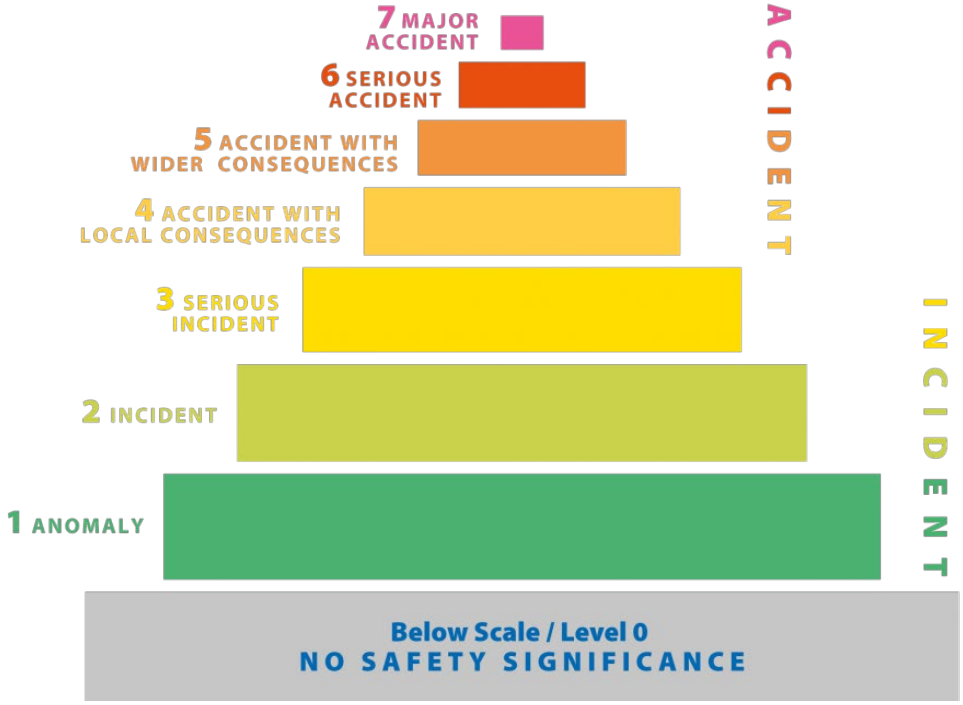
The region is also located within a close proximity to the Catawba Nuclear Station in South Carolina which houses two 1,129-megawatt pressurized water reactors. The plant was commissioned in 1985 and the second unit was added in 1986. It also operates with a very high level of security. It is jointly owned by North Carolina Municipal Power Agency Number One. Its first unit began operating in 1985, followed by the next unit in 1986, and is only 11 miles southwest of Charlotte, NC[53].

5.15.2 Location and Spatial Extent

The entire region is at risk to a nuclear incident. However, areas in the eastern part of the region are more susceptible due to their proximity to the McGuire Nuclear Station. The International Atomic Energy Association has developed a scale called the International Nuclear and Radiological Event Scale (INES) which provides a quantitative means of assessing the extent of a nuclear event. This scale, like the MMI used for earthquakes, is logarithmic which means that each increasing level on the scale represents an event 10 times more severe than the previous level (**Figure 5.26**).

[53] Duke Energy Power Plants Map (https://www.duke-energy.com/our-company/about-us/power-plants)

FIGURE 5.26: INTERNATIONAL NUCLEAR EVENT SCALE

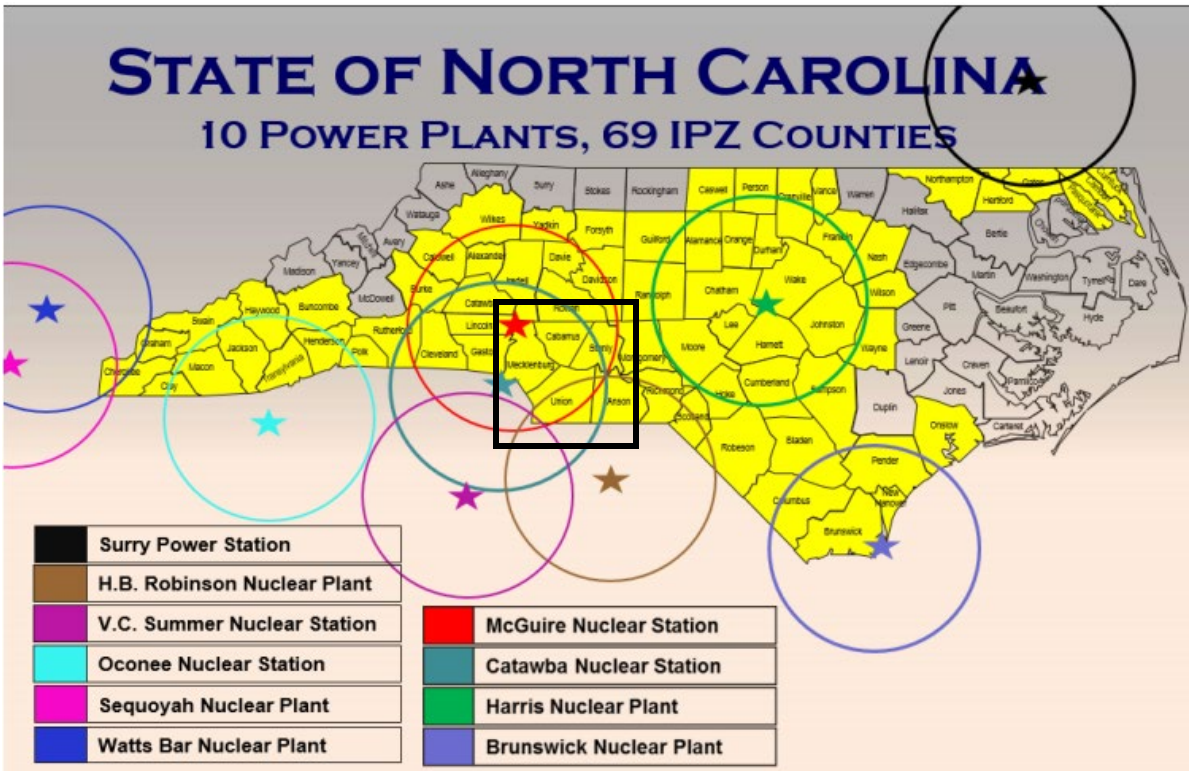


Source: International Atomic Energy Agency

The Nuclear Regulatory Commission defines two emergency planning zones around nuclear plants. Areas located within 10 miles of the station are considered to be within the zone of highest risk to a nuclear incident and this radius is the designated evacuation radius recommended by the Nuclear Regulatory Commission. Within the 10-mile zone, the primary concern is exposure to and inhalation of radioactive contamination. The most concerning effects in the secondary 50-mile zone are related to ingestion of food and liquids that may have been contaminated. All areas of the counties that are not located within the 10-mile radius are located within this 50-mile radius that is still considered to be at risk from a nuclear incident.

Both the McGuire Nuclear Station and the Catawba Nuclear Station are within ten miles of the Cabarrus Stanly Union Region. Furthermore, both of the plant's 50-mile buffer zones intersect the three counties. A map of all nuclear power plants in North Carolina can be seen below in **Figure 5.27**. Note that the Cabarrus Stanly Union region is identified in the black box.

FIGURE 5.27: NORTH CAROLINA NUCLEAR POWER STATIONS INCIDENT HAZARD ZONES



Source: NC Emergency Management

5.15.3 Historical Occurrences

Although there have been no major nuclear events at either the McGuire or Catawba Nuclear Station, there is some possibility that one could occur as there have been incidents in the past in the United States at other facilities and at facilities around the world.

5.15.4 Changing Future Conditions

Unlike other hazards discussed in this plan, climate change is unlikely to affect the occurrence or frequency of future radiological emergency events. However, severe weather could still potentially affect nuclear facilities in the form of physical damage which necessitates close monitoring.

5.15.5 Probability of Future Occurrences

A nuclear event is a very rare occurrence in the United States due to the intense regulation of the industry. There have been incidents in the past, but it is considered unlikely (less than 1 percent annual probability).

5.16 TERRORISM

5.16.1 Background and Description

For the purpose of this report, terrorism encompasses explosive, chemical, radiological, biological, nuclear, and other threats.

Terrorism is defined in the United States by the Code of Federal Regulations is "the unlawful use of force or violence against persons or property to intimidate or coerce a government, civilian population, or any segment thereof, in furtherance of political or social objectives." Terrorist acts may include assassinations, kidnappings, hijackings, bombings, small arms attacks, vehicle ramming attacks, edged weapon attacks, incendiary attacks, cyberattacks (computer-based), and the use of chemical, biological, nuclear and radiological weapons. For the purposes of this plan, cyberattacks are included as a separate hazard.

Historically the main categories of weapons of mass destruction (WMDs) used in terror attacks are Chemical, Biological, Radiological, Nuclear, and Explosive (collectively referred to as CBRNE). As we rank these categories, considering immediate danger posed, impact, probability, technical feasibility, frequency, and historical success, they are typically ranked in the following way.

Explosive

Explosive attacks lead all others due to their immediate danger to life and health, immediate and measurable impact, high probability, low cost/easy degree of technical feasibility, and a long history of high impact attacks.

Chemical

Chemical attacks can pose immediate danger to life and health depending upon the materials used. Chemicals are easy to access, low cost, and easy to deploy. Chemical terrorism can have high and persistent impacts to people and places. These types of attacks are probable and have had significant impacts in the past.

Radiological

Radiological attacks can pose significant threats to life and health depending upon the specific materials used. Radiological materials while restricted and regulated are accessible to people with some knowledge in this discipline. While radiological incidents have occurred, they occur less frequently than explosive and chemical attacks.

Biological

Biological attacks can pose significant threats to life and health. They are typically deployed as diseases and bio-toxins. They require some degree of technical expertise in order to be deployed successfully. While biological incidents have occurred, they occur less frequently than explosive and chemical attacks.

Nuclear

While yielding a very high impact, the nuclear attack is extremely rare due to the fact that it is cost prohibitive and very technically difficult to achieve. This type of attack, however, could be state sponsored which makes it viable.

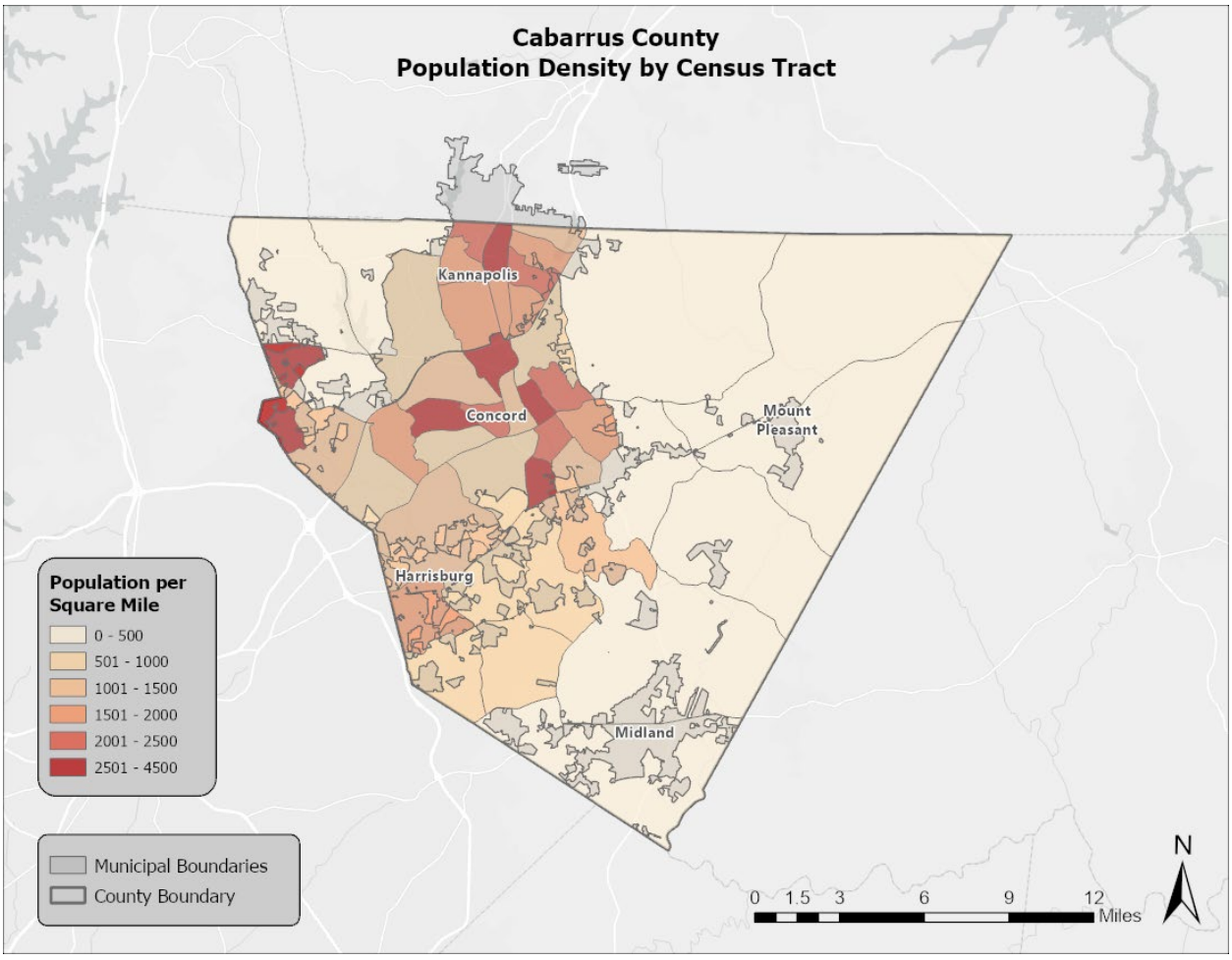
OTHER

Terrorism Hazard Assessment must also account for modern trends and changes. An additional "OTHER" category should be considered that includes small arms attacks, vehicle ramming attacks, edged weapon attacks, and incendiary attacks.

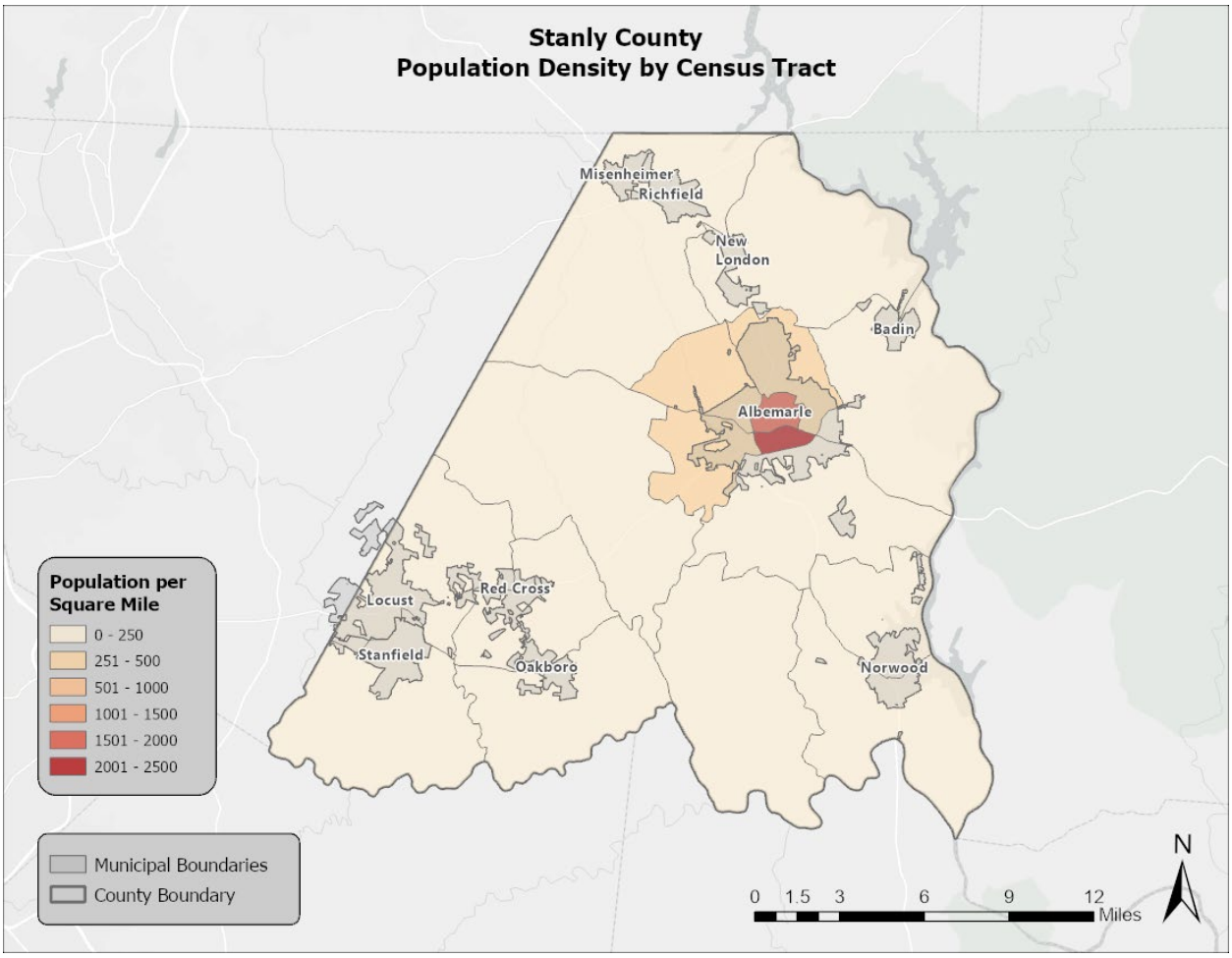
5.16.2 Location and Spatial Extent

All parts of North Carolina are vulnerable to a terror event; however, terrorism tends to target more densely populated areas. The maps in **Figure 5.28** display the population density in the Cabarrus Stanly Union region using census tract levels.

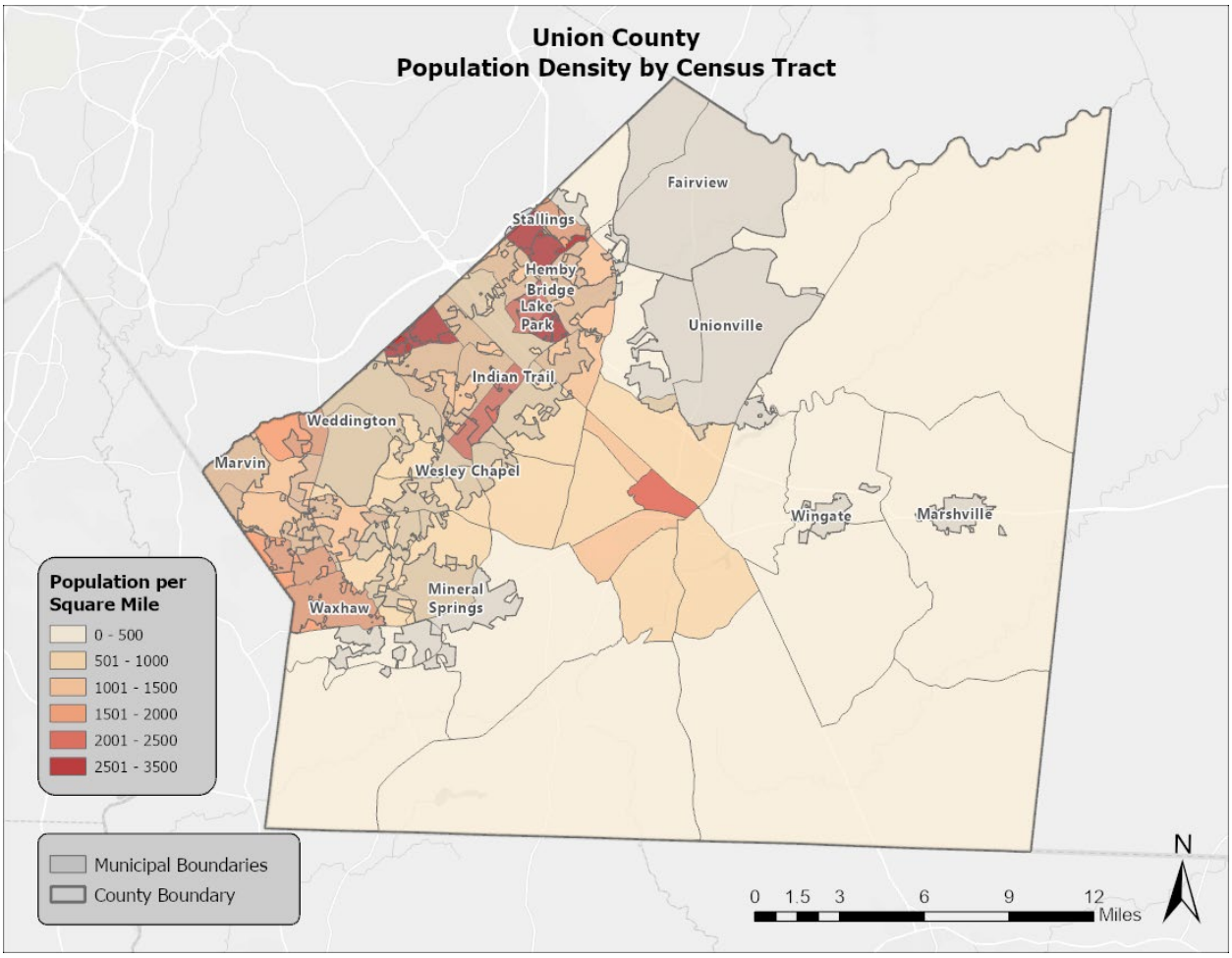
FIGURE 5.28: POPULATION DENSITY IN THE CABARRUS STANLY UNION REGION



Source: US Census Bureau



Source: US Census Bureau



Source: US Census Bureau

Furthermore, the most recent population counts of each participating county and jurisdictions based on American Community Survey (ACS) 5-year estimates and population density measured in population per square mile as of 2020 can be seen in **Table 5.34** below.

TABLE 5.34: 2022 POPULATION ESTIMATES

Location	2022 Population Estimate	2020 Population Density (sq. mi.)
Cabarrus County	**226,396**	**625.1**
Concord	105,335	1,657.9
Harrisburg	18,934	1,681.9
Kannapolis	53,314	1,623.6
Midland	4,675	352.1
Mount Pleasant	1,776	465.1
Unincorporated Area	42,362	--
Stanly County	**62,723**	**158.2**
Albemarle	16,444	941.1
Badin	2,075	1,116.4
Locust	4,700	559.5
Misenhiemer	652	401.2

Location	2022 Population Estimate	2020 Population Density (sq. mi.)
New London	674	307.3
Norwood	2,906	521.6
Oakboro	2,379	847.8
Red Cross	677	204.2
Richfield	921	240.3
Stanfield	1,463	354.6
Unincorporated Area	29,832	--
Union County	**240,109**	**376.6**
Fairview	3,512	115.3
Hemby Bridge	1,924	704.5
Indian Trail	40,325	1,798.7
Lake Park	3,342	4,447.6
Marshville	2,565	1,188.5
Marvin	6,421	1,062.1
Mineral Springs	3,185	384.8
Monroe	34,897	1,129.1
Stallings	16,193	1,928.4
Unionville	6,694	227.4
Waxhaw	20,665	1,696.6
Weddington	13,173	752.0
Wesley Chapel	8,763	897.9
Wingate	4,061	1,816.8
Unincorporated Area	74,389	--
Cabarrus Stanly Union Regional Total	**529,228**	**224.6**

Source: US Census Bureau, NC Office of State Budget and Management

5.16.3 Historical Occurrences

No extreme cases of terror attacks have previously affected the Cabarrus Stanly Union region. However, as the population in the area continues to increase, so does the chance of an attack.

5.16.4 Changing Future Conditions

The concept of "climate security," or the impacts of climate change on general peace and security of nations, has received increasing global attention in recent years and will likely continue to do so. According to the U.S. Government Accountability Office as of 2023, the overall threat of terrorism is also reportedly rising as incidents of domestic terrorism increased by 357% nationally between 2013 and 2021. The U.S. Department of Homeland Security notes in the 2024 Homeland Threat Assessment that national terrorism threats remain high as extremists react to future sociopolitical events.

With North Carolina ranked as the ninth most populous state in the U.S. (222.8 people/mi^2) as of 2024, its population growth may inherently raise the odds of terrorism incidents within the state.

5.16.5 Probability of Future Occurrences

The Cabarrus Stanly Union Region has experienced no major terrorist attacks, but the area's population is continuing to rise. The probability of future occurrences of a terrorist attack is entirely possible (between 1 to 10 percent annual probability) and preparedness must be ensured across all populated areas of the region.

5.17 CYBER

5.17.1 Background and Description

Cyberattacks are deliberate attacks on information technology systems in an attempt to gain illegal access to a computer, or purposely cause damage. As the world and the Cabarrus Stanly Union region become more technologically advanced and dependent upon computer systems, the threat of cyberattacks is becoming increasingly prevalent. Also known as computer network attacks, cyberattacks are difficult to recognize and typically use malicious code to alter computer data or steal information.

Mitigating and preparing for cyberattacks is challenging because of how diverse and complex attacks can be. The FBI is the lead federal agency for investigating cyberattacks by criminals, overseas adversaries, and terrorists. In North Carolina, the Department of Information Technology is the lead agency that maintains Cybersecurity and Risk Management resources.

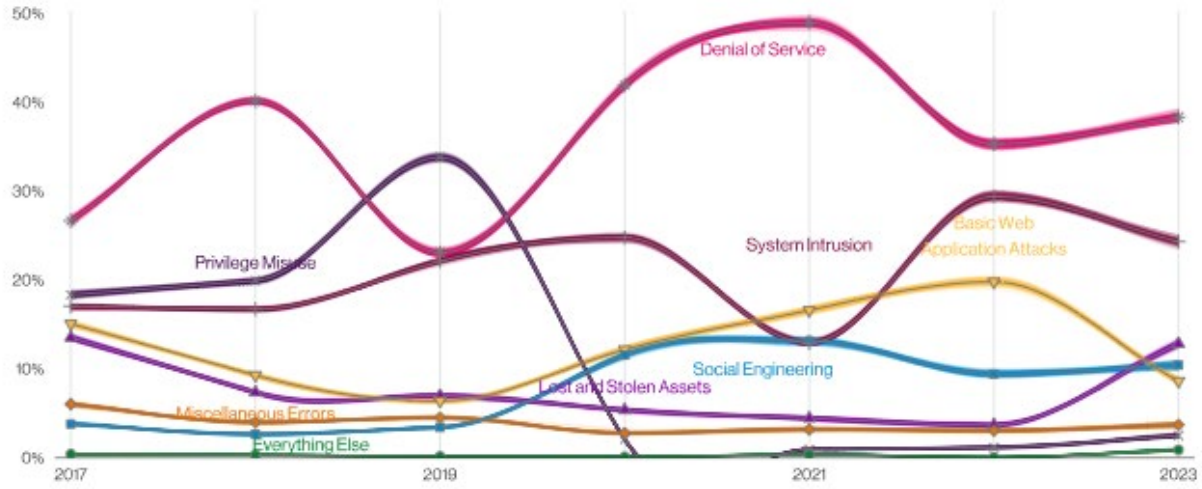
Cyberattacks can happen in both the public and private sector. They may be carried out by a specific individual, or by groups from afar. Many attacks attempt to steal money or to disturb normal operations. According to the 2023 Verizon Report of Data Breaching, 83% of breaches involved external actors, with the majority of them being financially motivated.

There are many types of cyberattack incident patterns, which include:

- Web App Attacks: Incidents in which web applications were attacked, which can include exploiting code-level vulnerabilities in the application.
- Point-of-Sale Intrusions: Remote attacks against environments where card-present retail transactions are conducted.
- Insider and Privilege Misuse: Unapproved or malicious use of organizational resources.
- Miscellaneous Errors: Incidents in which unintentional actions directly compromise an attribute of a security asset.
- Physical Theft and Loss: Incidents where an information asset went missing.
- Crimeware: Instances involving malware that do not fit into a more specific pattern.
- Payment Card Skimmers: Incidents involving skimming devices physically implanted on an asset that reads magnetic stripe data from payment cards.
- Cyber-espionage: Unauthorized network or system access linked to state-affiliated actors.
- Denial-of-Service Attacks: Any attack intended to compromise the availability of networks and systems that are designed to overwhelm systems, resulting in performance degradation or interruption of service.

Figure 5.29 below displays nationwide cyberattack incident patterns over time (2017 to 2023) from the 2023 Verizon Data Breach Investigations Report (DBIR).

FIGURE 5.29: PERCENTAGES AND PATTERNS OF INCIDENTS OVER TIME



Source: 2023 Verizon Data Breach Investigations Report

5.17.2 Location and Spatial Extent

Cyberattacks happen all over the world and are not restricted to a certain locational boundary. They tend to affect the public industry rather than private industries.

5.17.3 Historical Occurrences

In North Carolina and the Cabarrus Stanly Union region, the Department of Information Technology specializes in cybersecurity and risk management. Within the department, the NC Information Sharing and Analysis Center gathers information on cyberattack threats within the State to raise cybersecurity preparedness.

In 2023, North Carolina reported the highest number of cybercrimes in the "personal data breach" sector, which can be seen in **Table 5.35** below.

TABLE 5.35: NORTH CAROLINA CYBERCRIMES AND VICTIM COUNTS IN 2023

Crime Type by Victim Count			
Crime Type	*Victim Count*	*Crime Type*	*Victim Count*
Advanced Fee	211	Lottery/Sweepstakes/Inheritance	119
BEC	596	Malware	20
Botnet	13	No Lead Value	1,122
Confidence/Romance	453	Non-payment/Non-Delivery	1,295
Credit Card/Check Fraud	337	Other	186
Crimes Against Children	46	Overpayment	115
Data Breach	93	Personal Data Breach	1,571
Employment	402	Phishing/Spoofing	150
Extortion	1,269	Ransomware	59
Government Impersonation	410	Real Estate	242
Harassment/Stalking	284	SIM Swap	18
IPR/Copyright and Counterfeit	33	Tech Support	1,032
Identity Theft	454	Threats of Violence	44
Investment	692		
Descriptors*			
Cryptocurrency	996	Cryptocurrency Wallet	480

Source: FBI Internet Crime Complaint Center (IC3), 2023

Although the Cabarrus Stanly Union Region has not reported any major catastrophic cyberattacks, the potential to experience one is unpredictable and can happen at any time.

5.17.4 Changing Future Conditions

Unlike other hazards discussed in this plan, climate change is unlikely to affect the occurrence or frequency of future cyberattack incidents. Ongoing preparedness and training efforts will remain especially important as global data usage trends and cyberattack threats evolve in future years.

5.17.5 Probability of Future Occurrences

As the world's dependency on technology grows, the possibility of experiencing cyberattacks rises as well. Although there have not been severe past occurrences in the region, the growing risks of cyberattack capabilities suggest they are possible (between 1 to 10 percent annual probability) in the near future.

5.18 ELECTROMAGNETIC PULSE

5.18.1 Background and Description

The United States Department of Energy defines electromagnetic pulses (EMPs) as "intense pulses of electromagnetic energy resulting from solar-caused effects or man-made nuclear and pulse power devices." EMPs can be naturally occurring or human-caused hazards. Examples of natural EMP events include:

- Lightning electromagnetic pulse
- Electrostatic discharge
- Meteoric electromagnetic pulse
- Coronal mass ejection, also known as a solar electromagnetic pulse

A human-caused EMP (such as a nuclear EMP) is a technological hazard that can cause severe damage to electrical components attached to power lines or communication systems. One of the most complex aspects of EMPs is the fact they are invisible, unpredictable, and rapid. They can also overload electronic devices that people heavily rely on every day. EMPs are harmless to people biologically; however, an EMP attack could damage electronic systems such as planes or cars. This could cause destruction of property and life and potentially generate disease or societal collapse.

In 2015, Congress amended the Homeland Security Act of 2002 by passing the Critical Infrastructure Protection Act (CIPA), which protects Americans from an EMP. It also required reporting of EMP threats, research and development, and a campaign to educate planners and emergency responders about EMP events.

5.18.2 Location and Spatial Extent

An EMP can happen in any location, and they are relatively unpredictable. Due to advancing technologies, densely populated may be more prone to damages from an EMP. Therefore, bigger cities in the Cabarrus Stanly Union region may be more susceptible.

5.18.3 Historical Occurrences

There have been no reports of EMP occurrences in the Cabarrus Stanly Union region.

5.18.4 Changing Future Conditions

Unlike other hazards discussed in this plan, climate change is unlikely to affect the occurrence or frequency of potential EMP incidents. One of the most problematic threats of EMPs is a widespread lack of general understanding regarding potential consequences among local, state, and federal entities. As technological innovation grows, updated information on this unique hazard can then be distributed.

5.18.5 Probability of Future Occurrences

The probability of an EMP is unlikely (less than 1 percent annual probability), but an occurrence could have catastrophic impacts.

5.19 CIVIL DISTURBANCE

5.19.1 Background and Description

Civil disturbances often refer to incidents in which multiple people knowingly act against established laws or regulations, with a common goal of bringing attention to a specific cause or larger sociopolitical movement. Modern laws have evolved in response to the changing understanding and real-world applications by which to peacefully resolve civil conflict. In the United States, "freedom of assembly" is a constitutional protection for peaceful and lawful purposes among the public. However, assemblies that are not peaceful or lawful (e.g., angry mobs) do not receive these same legal protections. The laws covering disruptive and disorderly conduct are generally grouped into various offenses that disturb the public peace ranging from general misdemeanors up to severe felonies.

When a riot or similar public disturbance occurs, local law enforcement agencies are initially mobilized and responsible for addressing the event. If local law enforcement agencies lack sufficient capacity or become overwhelmed by the response effort, state law enforcement agencies may be deployed. According to the North Carolina Emergency Operations Plan (NCEOP), the State Emergency Response Team (SERT) Emergency Services Branch will coordinate state law enforcement activities during public disturbances, riots and/or emergency situations. In extreme cases, the Governor of North Carolina has the authority to mobilize the National Guard to protect persons and property and restore order.

The extent of any civil disturbance incident will often depend on the scale and crowd size of that event in conjunction with its location. The more widespread a civil incident is, the greater the likelihood of significant injuries, loss of life, and extensive property damage. Rapid containment of the event by law enforcement is especially critical in minimizing the number of injuries and damages.

A book published by the University of Minnesota, *Sociology: Understanding and Changing the Social World*, discusses the typology of crowds based on the differences observed between the gathering purpose and existing dynamics between the participants. A crowd is generally recognized to be a temporary gathering of people without any real social relationships present between them. Building off the work of sociologist Herbert Blumer, the book explicitly distinguishes five crowd categories:

- **Casual Crowd –** A random collection of people gathered somewhere at the same time. The crowd has no shared identity or purpose. This type of crowd can include shoppers and tourists among many others. The likelihood of any violence is basically nonexistent.
- **Conventional Crowd –** A collection of people who gather for a shared purpose or activity, like a big dance, a sporting event, or a festival/concert. Crowd behavior is relatively structured and would require substantial provocation to arouse any kind of violence.
- **Expressive Crowd –** A collection of people who gather for some kind of excitement and to express at least one emotion. Examples of this crowd can include a political rally or loosely structured protests.
- **Protest Crowd –** A collection of people who gather to directly protest a targeted political, social, cultural, or economic issue. People in these types of crowds may engage in various activities together through sit-ins, demonstrations, or marches/rallies.
- **Acting Crowd –** A collection of people specifically assembled for a guiding purpose. Acting crowds tend to be more impulsive, more emotional, and require only minimal stimulation to be spurred into violence. Acting crowds can quickly spiral into large and uncontrollable riots depending on the circumstances.

5.19.2 Location and Spatial Extent

Civil disturbances can materialize from a variety of different circumstances and societal factors. The driving forces may be spontaneous or a direct result of escalating tensions. The most likely locations for this specific hazard are areas with large numbers of people clustered together. Sites preparing for political or other interest-based events/rallies should often be assessed as hotspot potential locations for a civil disturbance incident. Arenas and stadiums capable of hosting thousands of people at a time are other areas of concern as well. A civil disturbance incident may also spill over into surrounding areas beyond where an initial "trigger event" occurred.

5.19.3 Historical Occurrences

No major incidents were found for the region.

5.19.4 Changing Future Conditions

While climate change would not necessarily have a direct impact on civil disturbances, the ongoing climate crisis could present a cause for civil disorder in the Cabarrus Stanly Union Region related to "climate security" risks. Climate change projections, previously discussed across the natural hazards included in this plan, could eventually lead to extreme weather events that exacerbate issues of drought, flooding, severe storms, and other pressing hazards with the potential to damage socio-ecological systems and greatly reduce access to critical resources (e.g., water, food, energy) thereby upsetting general order in society.

5.19.5 Probability of Future Occurrences

Civil disturbances are bound to be recurrent on a local, regional, and national scale as they are unpredictable features of social life. The Cabarrus Stanly Union Region will continue to experience protests, demonstrations, and other energized gatherings across its various cities and communities that could ultimately lead to some form of disruptive behavior. Based on the unpredictable nature and few past occurrences of civil disturbance in the Cabarrus Stanly Union Region, the future probability of civil disturbance incidents is considered possible (between 1 to 10 percent annual probability).

5.20 FOOD EMERGENCY

5.20.1 Background and Description

According to the 2019 National Food and Agriculture Incident Annex (FAIA) to Federal Interagency Operational Plans (FIOPs) published by FEMA, a food emergency refers to the "adulteration and/or contamination, threatened or actual, of food that impacts or may impact human health or the safety or availability of the state's food supply". As noted in the 2023 State of North Carolina Hazard Mitigation Plan, food emergencies may stem from multiple distinct causes including inclement weather events (e.g., hurricanes, floods, droughts) or technological failures like power outages and storage system leaks that ultimately result in losses of edible foods. A food emergency may also alternatively stem from human activities, including either unintentional or intentional contamination leading to public health impacts. Food emergencies often have many compounding effects with infectious disease hazards.

Additionally, the 2023 Food Emergency Response Plan in Annex B of the North Carolina Emergency Operations Plan (NCEOP) indicates that North Carolina's impact related to the food and agricultural production, processing, and retail systems industry is:

- Valued at over **$68 billion**
- Employs approximately **20%** of the total workforce
- Makes it the **third most agriculturally diverse state** in the U.S.

A food emergency incident could have severe consequences across the larger industry including anywhere affected by regional food markets and may ultimately jeopardize the public health of any locally affected populations. It is important to note that food systems are inherently complex and refer to many different interrelated activities and groups that all affect how food is produced and eventually consumed by individuals. Generally speaking, a food system can be simplified into key broader components of (1) production, (2) processing, (3) distribution, and (4) consumption.

5.20.2 Location and Spatial Extent

No rating system exists for a relative assessment of food emergency scale and overall extent since many factors depend on a case-by-case basis. However, unsafe and/or unavailable food supplies have the potential to affect isolated communities and may affect the entire planning area in extreme instances.

5.20.3 Historical Occurrences

In November 2018, nearly 300 people reported feeling ill after eating contaminated stew at a church barbeque in Cabarrus County.

5.20.4 Changing Future Conditions

As weather patterns and the global climate continue to change in the future, the overall risk of food emergencies could begin to increase as well. According to the North Carolina Climate Science Report, it is likely that major droughts will increase in frequency and intensity due to higher temperatures and evaporation rates which may in turn create many new agricultural challenges. It should be noted that these factors can also affect the ability of pathogens to spread among both crops and livestock. Heavy precipitation from hurricanes and thunderstorms is also very likely to increase and create greater flooding risks throughout North Carolina. This may lead to emerging threats of a food emergency based on historical trends observed regarding crop losses and subsequent contamination of edible crops from intense storm flooding.

5.20.5 Probability of Future Occurrences

Few past occurrences of this hazard in the form of foodborne illness or contamination have been documented in the Cabarrus Stanly Union Region. Historical data is very limited for food emergencies resulting from any deliberate contamination of food, but the possibility of this risk still exists. Based on the unpredictable nature and occurrences of food emergencies in the Cabarrus Stanly Union Region, the future probability of food emergency incidents is considered possible (1 to 10 percent annual probability).

5.21 CONCLUSIONS ON HAZARD RISK

The hazard profiles presented in this section were developed using best available data and result in what may be considered principally a qualitative assessment as recommended by FEMA in its "How-to" guidance document titled *Understanding Your Risks: Identifying Hazards and Estimating Losses* (FEMA Publication 386-2). It relies heavily on historical and anecdotal data, stakeholder input, and professional and experienced judgment regarding observed and/or anticipated hazard impacts. It also carefully considers the findings in other relevant plans, studies, and technical reports, including the potential dynamics of changing future conditions (e.g., climate change) in the planning area.

5.21.1 Hazard Extent

Table 5.36 describes the extent of each natural hazard identified for the Cabarrus Stanly Union Region. The extent of a hazard is defined as its severity or magnitude, as it relates to the planning area.

TABLE 5.36 EXTENT OF CABARRUS STANLY UNION REGION HAZARDS

Natural Hazards	
Drought	Drought extent is defined by the North Carolina Drought Monitor Classifications which include Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought (Table 5.3). According to the North Carolina Drought Monitor Classifications, the most severe drought condition is Exceptional. Each of the participating counties has received this ranking several times over the reporting period of 20+ years.
Excessive Heat	The extent of excessive heat can be defined by the maximum temperature reached. The highest temperature recorded in the Cabarrus Stanly Union Region is 109 degrees Fahrenheit (reported on July 28, 1940). • Cabarrus County: 107°F • Stanly County: 109°F • Union County: 107°F
Hurricane and Coastal Hazards	Hurricane extent is defined by the Saffir-Simpson Scale which classifies hurricanes into Category 1 through Category 5 (Tables 5.10 and 5.11). The greatest classification of hurricane to traverse directly through the Cabarrus Stanly Union Region was Hurricane Hugo in 1989 which carried tropical force winds of 58 miles per hour upon arrival. The following list the greatest extent of hurricane winds to pass through the area, though it should be noted that stronger storms could impact the region without a direct hit: • Cabarrus County: Hurricane Hugo (1989), Tropical Storm (58 miles per hour) • Stanly County: Hurricane Hugo (1989), Tropical Storm (58 miles per hour) • Union County: Hurricane Hugo (1989), Tropical Storm (58 miles per hour)
Tornadoes/ Thunderstorms	Tornadoes: Tornado hazard extent is measured by tornado occurrences in the US provided by FEMA (Figure 5.7) as well as the Fujita/Enhanced Fujita Scale (Tables 5.13 and 5.14). The greatest magnitude reported in the region was an F4 (reported on May 5, 1989). • Cabarrus County: F2 • Stanly County: F2 • Union County: F4 Thunderstorms: Thunderstorm extent is defined by the number of thunder events and wind speeds reported. According to a 70+ year history from the National Centers for Environmental Information, the strongest recorded wind event in the Cabarrus Stanly Union Region was reported on June 22, 2001, at 100 knots (approximately 115 mph). It should be noted that future events may exceed these historical occurrences. • Cabarrus County: 65 knots • Stanly County: 70 knots • Union County: 100 knots

	Lightning: According to the Vaisala flash density map (Figure 5.8), the Cabarrus Stanly Union Region is located in an area that experiences 8 to 16 lightning flashes per square kilometer per year. It should be noted that future lightning occurrences may exceed these figures. Hailstorms: Hail extent can be defined by the size of the hail stone. The largest hail stone reported in the Cabarrus Stanly Union Region was 4.5 inches (reported on June 5, 1985). It should be noted that future events may exceed this. • Cabarrus County: 4.5 inches • Stanly County: 2.75 inches • Union County: 2.25 inches
Severe Winter Weather	The extent of winter storms can be measured by the amount of snowfall received (in inches). The greatest 24-hour snowfall was reported in the region was 25 inches reported on January 26, 1920. Due to variations in elevation throughout the region, extent totals will vary for each participating jurisdiction and reliable data on snowfall totals is not available. • Cabarrus County: 11 inches • Stanly County: 25 inches • Union County: 13 inches
Earthquakes	Earthquake extent can be measured by the Richter Scale (Table 5.21) and the Modified Mercalli Intensity (MMI) scale (Table 5.22) and the distance of the epicenter from the Cabarrus Stanly Union Region. According to data provided by the USGS and NCEI, the greatest MMI to impact the region was VI (strong) with a correlating Richter Scale measurement of approximately 5.4 (reported on September 1, 1886). The epicenter of this earthquake was located between 236 and 284 km away. • Cabarrus County: VI; 284 km to epicenter • Stanly County: V; 273 km to epicenter • Union County: VI; 236 km to epicenter
Geological	Landslide: As noted above in the landslide profile, the landslide data provided by the North Carolina Geological Survey is incomplete. This provides a challenge when trying to determine an accurate extent for the landslide hazard. However, when using the USGS landslide susceptibility index, extent can be measured with incidence, which is high throughout most of Cabarrus County and Stanly County (the remainder of the region has low incidence). There is also at least moderate susceptibility throughout a majority of the region (excluding a small area in southeast Union County which has low susceptibility). Sinkhole: The western part of North Carolina and the Cabarrus Stanly Union Region is susceptible to sinkholes; however, there are no historical records of sinkholes in the region. Erosion: The extent of erosion can be defined by the measurable rate of erosion that occurs. There are no erosion rate records available for the Cabarrus Stanly Union region.
Dam Failure	Dam failure extent is defined using the North Carolina Division of Energy, Mineral, and Land Resources criteria (Table 5.25). Of the 332 dams in Cabarrus Stanly Union Region, 79are classified as high hazard. • Cabarrus County: 29 high hazard dams • Stanly County: 15 high hazard dams • Union County: 35 high hazard dams
Flooding	Flood extent can be measured by the amount of land and property in the floodplain as well as flood height and velocity. The amount of land in the floodplain accounts for nearly 7 percent of the total land area in the Cabarrus Stanly Union Region. Flood depth and velocity are recorded via the United States Geological Survey (USGS) stream gages throughout the region. While a gage does not exist for each participating jurisdiction, there is one at or near many areas. The greatest peak discharge recorded for the area was reported on September 18, 1945. Water reached a discharge of 105,000 cubic feet per

second and the stream gage height was recorded at 46.37 feet. Additional peak discharge readings and gage heights are in the table below.

Location/Jurisdiction	Date	Peak Discharge (cfs)	Gage Height (ft)
Cabarrus County			
Rocky Road at Irish Buffalo Creek near Rocky River	4/11/2003	9,760	23.21
Stanly County			
Rocky River near Norwood	9/18/1945	105,000	46.37
Union County			
EF Twelve Mile Creek near Waxhaw	8/27/1995	9,970	21.94

Depth of flooding inside structures across the region during a maximum flood event ranges from 2-4 feet and varies based on the structure's location in the floodplain and the elevation of the structure.

Wildfires

Wildfire data was provided by the North Carolina Forest Service and is reported annually by county from 2003-2018. Analyzing the data by county indicates the following wildfire hazard extent for each county.

Cabarrus County
- The greatest number of fires to occur in any year was 55 in 2004.
- The greatest number of acres to burn in a single year occurred in 2011 when 61 acres were burned.

Stanly County
- The greatest number of fires to occur in any year was 103 in 2007.
- The greatest number of acres to burn in a single year occurred in 2010 when 149 acres were burned.

Union County
- The greatest number of fires to occur in any year was 144 in 2007.
- The greatest number of acres to burn in a single year occurred in 2005 when 182 acres were burned.

Although this data lists the extent that has occurred, larger and more frequent wildfires are possible throughout the region.

Infectious Disease

There is no available method for determining dollar losses due to infectious diseases at this time; however, $477,500 was allocated from the Governor's yearly budget in 2016 for preventative measures regarding the Zika Virus. The entire Cabarrus Stanly Union Region is susceptible to infectious diseases such as the flu, which kills hundreds of people annually.

Technological Hazards

Hazardous Materials Incident

According to USDOT PHMSA, the largest severe hazardous materials incident reported in the region is 10,000 LGA released by a rail incident on October 11, 1990. It should be noted that larger events are possible.
- Cabarrus County: 2,600 LGA
- Stanly County: 400 LGA
- Union County: 10,000 LGA

Radiological Emergency – Fixed Nuclear Facilities	Although there is no history of a nuclear accident at the McGuire or Catawba Nuclear Stations, other events across the globe and in the United States in particular indicate that an event is possible. Since several national and international events were Level 7 events on the INES, the potential for a Level 7 event at McGuire or Catawba is possible.
Terrorism	Although no severe terrorism attacks have been reported in the Cabarrus Stanly Union Region, the entire area is still at risk to a future event. Densely populated areas, such as cities, are considered more susceptible. Terror events have the potential to affect the human population, buildings and infrastructure, and the economy in the region.
Cyber	No cyberattacks have been historically reported in the Cabarrus Stanly Union Region. Technology usage, however, is increasing. A cyberattack could potentially devastate the region's economy and could have lasting negative impacts.
Electromagnetic Pulse	Electromagnetic Pulse (EMP) occurrences have not taken place in the Cabarrus Stanly Union Region, but the risk still exists. If an EMP were to occur, the effects would negatively impact first responders and communication efforts and may cause panic within the area.
Civil Disturbance	No major instances of civil disturbances have been identified in the Cabarrus Stanly Union Region. However, established social systems of the area are still changing every year in response to new social, political, and/or cultural events.
Food Emergency	Some instances of food emergencies, especially in the form of mass foodborne illness (e.g., *E. coli* and *Salmonella*) or contamination, have been identified in the Cabarrus Stanly Union Region. Additionally, established food systems of the area are still changing every year in response to new hazard events, changing climatic conditions, and evolving contamination threats.

5.21.2 Priority Risk Index

Results of the Hazard Identification and Risk Assessment (HIRA) process described in detail above were determined using a "Priority Risk Index" (PRI) methodology to help develop meaningful planning conclusions for the region. The guiding purpose of the PRI is to rate, categorize, and indicate priority among all potential hazards in the planning area. These ratings include high, moderate, or low risk hazards based on the scale described below. When combined with the quantitative data from the asset inventory and vulnerability assessment in the following section, the summary classifications developed using the PRI contribute to targeted prioritization and mitigation planning efforts related to hazards of higher risk. More specifically, it facilitates the identification of hazard mitigation opportunities for all of the jurisdictions in the region to consider as part of their proposed strategies.

The prioritization and categorization of identified hazards for the Cabarrus Stanly Union Region is based principally on the PRI, a tool used to measure the degree of risk for identified hazards in a particular planning area. The PRI is used to assist the Cabarrus Stanly Union Regional Hazard Mitigation Planning Committee in gaining consensus on the determination of those hazards that pose the most significant threat to the Cabarrus Stanly Union counties based on a variety of factors. The PRI is not scientifically based, but is rather meant to be utilized as an objective planning tool for classifying and prioritizing hazard risks in the Cabarrus Stanly Union Region based on standardized criteria.

The application of the PRI results in numerical values that allow identified hazards to be ranked against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time, and duration). Each degree of risk has been assigned a value (1 to 4) and an agreed upon

weighting factor[54], as summarized in **Table 5.37**. To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final PRI value, as demonstrated in the example equation below:

PRI VALUE = [(PROBABILITY x .30) + (IMPACT x .30) + (SPATIAL EXTENT x .20) + (WARNING TIME x .10) + (DURATION x .10)]

According to the weighting scheme and point system applied, the highest possible value for any hazard is 4.0. When the scheme is applied for the Cabarrus Stanly Union Region, the highest PRI value out of 4.0 will indicate the hazard with the greatest potential priority. Prior to being finalized, PRI values for each identified hazard were reviewed and accepted by the members of the Regional Hazard Mitigation Planning Committee.

TABLE 5.37: PRIORITY RISK INDEX

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1% and 10% annual probability	2	
	Likely	Between 10 and 100% annual probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete	4	

[54] The Regional Hazard Mitigation Planning Committee, based upon any unique concerns or factors for the planning area, may adjust the PRI weighting scheme during future plan updates.

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
		shutdown of critical facilities for 30 days or more.		
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self-explanatory	1	10%
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
Duration	Less than 6 hours	Self-explanatory	1	10%
	Less than 24 hours	Self-explanatory	2	
	Less than one week	Self-explanatory	3	
	More than one week	Self-explanatory	4	

5.21.3 Priority Risk Index Results

Table 5.38 summarizes the degree of risk assigned to each category for all initially identified hazards based on the application of the PRI. Assigned risk levels were based on the detailed hazard profiles developed for this section, as well as input from the Regional Hazard Mitigation Planning Committee. The results were then used in calculating PRI values and making final determinations for the risk assessment.

TABLE 5.38: SUMMARY OF PRI RESULTS

Hazard	Subhazard(s) Assessed	Category/Degree of Risk					
		Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Natural Hazards							
Drought	Agricultural, Hydrological	Likely	Minor	Large	More than 24 hours	More than 1 week	**2.5**
Excessive Heat		Likely	Critical	Large	More than 24 hours	Less than 1 week	**3.1**
Hurricane and Coastal Hazards	Storm Surge, Severe Weather	Possible	Critical	Large	More than 24 hours	Less than 1 week	**2.7**
Tornadoes/ Thunderstorms	High Wind, Hail, Lightning	Highly Likely	Critical	Moderate	6 to 12 hours	Less than 6 hours	**3.1**
Severe Winter Weather	Snow, Blizzards, Wind Chill, Extreme Cold,	Likely	Critical	Large	More than 24 hours	Less than 1 week	**3.0**

Hazard	Subhazard(s) Assessed	Category/Degree of Risk					
		Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
	Ice Storms, Freezing Rain						
Earthquakes		Possible	Limited	Moderate	Less than 6 hours	Less than 6 hours	**2.3**
Geological	Landslide, Sinkholes, Erosion	Possible	Limited	Small	Less than 6 hours	Less than 6 hours	**2.1**
Dam Failure		Unlikely	Critical	Moderate	Less than 6 hours	Less than 1 week	**2.5**
Flooding		Likely	Critical	Moderate	6 to 12 hours	More than 1 week	**3.1**
Wildfires		Likely	Critical	Moderate	12 to 24 hours	More than 1 week	**3.0**
Infectious Disease	Vector-Borne Disease, Foreign Animal Disease	Likely	Critical	Large	More than 24 hours	More than 1 week	**3.1**
Technological Hazards							
Hazardous Substances	Hazardous Materials, Hazardous Chemicals, Oil Spill, Road/Rail Incidents	Likely	Limited	Small	Less than 6 hours	Less than 24 hours	**2.5**
Radiological Emergency	Fixed Nuclear Facilities	Unlikely	Critical	Moderate	6 to 12 hours	Less than 1 week	**2.4**
Terrorism	Explosive, Chemical, Radiological, Biological, Nuclear	Possible	Critical	Small	Less than 6 hours	Less than 24 hours	**2.5**
Cyber	Mass power/utility disruption	Likely	Critical	Moderate	Less than 6 hours	More than 1 week	**3.2**
Electromagnetic Pulse		Unlikely	Critical	Moderate	12 to 24 hours	More than 1 week	**2.4**
Civil Disturbance		Possible	Limited	Small	Less than 6 hours	Less than 24 hours	**2.2**
Food Emergency		Possible	Critical	Moderate	More than 24 hours	More than 1 week	**2.6**

5.22 FINAL DETERMINATIONS

The conclusions drawn from the hazard profiling process for the Cabarrus Stanly Union Region, including the PRI results and input from the Regional Hazard Mitigation Planning Committee, resulted in the classification of risk for each identified hazard according to three categories: High Risk, Moderate Risk, and Low Risk. For the purposes of these classifications, risk is expressed in relative terms according to the estimated impact that a hazard will have on human life and property throughout all of the Cabarrus Stanly Union Region. It should be noted that although some hazards are classified below as posing low risk, their occurrence of varying or unprecedented magnitudes is still possible in some cases and their assigned classification will continue to be evaluated during future plan updates.

A more quantitative analysis to estimate potential dollar losses for each hazard has been performed separately and is described in **Section 6: *Vulnerability Assessment***.

Table 5.39 ranks the hazards that were assessed in the update that were renamed to be consistent with the State of North Carolina Hazard Mitigation Plan. These conclusions were based on the PRI calculations and input from the Cabarrus Stanly Union Regional Planning Committee.

TABLE 5.39: 2025 CONCLUSIONS ON HAZARD RISK FOR THE CABARRUS STANLY UNION REGION

HIGH RISK	Cyber Excessive Heat Tornadoes/Thunderstorms Flooding Infectious Disease
MODERATE RISK	Drought Hurricanes and Coastal Hazards Severe Winter Weather Earthquakes Geological Dam Failure Wildfires Hazardous Substances Terrorism Food Emergency
LOW RISK	Radiological Emergency Electromagnetic Pulse Civil Disturbance

SECTION 6
VULNERABILITY ASSESSMENT

This section identifies and quantifies the vulnerability of the jurisdictions within the Cabarrus Stanly Union Region to the significant hazards identified in the previous sections (*Hazard Identification and Hazard Profiles*). It consists of the following subsections:

- 6.1 Overview
- 6.2 Methodology
- 6.3 Explanation of Data Sources
- 6.4 Asset Inventory
- 6.5 Vulnerability Assessment Results
- 6.6 Conclusions on Hazard Vulnerability

44 CFR Requirement

44 CFR Part 201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description must include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008, must also address NFIP insured structures that have been repetitively damaged by floods. The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

6.1 OVERVIEW

This section builds upon the information provided in Section 4: Hazard Identification and Section 5: *Hazard Profiles* by identifying and characterizing an inventory of assets in the Cabarrus Stanly Union Region. Additionally, an assessment is conducted for each identified hazard, including the potential impact and expected amount of damages it may cause. The primary objective of the vulnerability assessment is to quantify exposure and the potential loss estimates for each hazard. In doing so, each county and their participating jurisdictions may better understand their unique risks to identified hazards and be better prepared to evaluate and prioritize specific hazard mitigation actions.

This section begins with an explanation of the methodology applied to complete the vulnerability assessment, followed by a summary description of the asset inventory as compiled for jurisdictions in the Cabarrus Stanly Union Region. The remainder of this section focuses on the results of the assessment conducted.

6.2 METHODOLOGY

This vulnerability assessment was conducted using two distinct methodologies: (1) a geographic information system (GIS)-based analysis; and (2) a risk modeling analysis. Each approach provides estimates for the potential impact of hazards by using a common, systematic framework for evaluation, including historical occurrence information provided in the *Hazard Identification* and *Hazard Profiles* sections. A brief description of the three different approaches is provided on the following pages.

For the dam failure[1], drought, excessive heat, infectious disease, radiological emergency, terrorism, cyber, EMP, and geological hazards (erosion and sinkholes), no data with historical property damages was available. Therefore, a detailed vulnerability assessment could not be completed for these hazards at this time. Results are supplemented by FEMA's National Risk Index where information was available.

The results for these hazards are found at the end of this section in **Table 6.28**.

6.2.1 GIS-Based Analysis

Other hazards have specified geographic boundaries that permit additional analysis using Geographic Information Systems (GIS). These hazards include:

- Flooding
- Hazardous Substances
- Geological (Landslide)
- Wildfires

The objective of the GIS-based analysis was to determine the estimated vulnerability of critical facilities and populations for the identified hazards in the Cabarrus Stanly Union Region using best available geospatial data[2]. Digital data was collected from local, regional, state, and national sources for hazards and buildings. This included local tax assessor records for individual parcels and buildings and georeferenced point locations for identified assets (critical facilities and infrastructure, special populations, etc.) when available. ESRI® ArcGIS Pro™ was used to assess hazard vulnerability utilizing digital hazard data, as well as local building data. Using these data layers, hazard vulnerability can be quantified by estimating the assessed building value for parcels and/or buildings determined to be in identified hazard areas. To estimate vulnerable populations in hazard areas, digital Census 2020 data by census tract was obtained and was supplemented with current population estimates from the US Census Bureau. This was intersected with hazard areas to determine exposed population counts. Unfortunately, due to the large scale of census tracts, the results are limited, but will be revised as data by census block becomes available for all areas in the region. The results of the analysis provided an estimate of the number of people and critical facilities, as well as the assessed value of parcels and improvements, determined to be potentially at risk to those hazards with delineable geographic hazard boundaries.

[1] As noted in **Section 5: *Hazard Profiles***, dam failure could be catastrophic to structures and populations in the inundation area. However, due to lack of data, no additional analysis was performed. Further, USACE and NCDEQ also complete separate dam failure plans to identify risk and response measures.

[2] **Note that geospatial attributes, coordinates, and/or addresses of some jurisdictional facilities may be outdated** and recent changes in location or operations may not be corrected in the latest data release from various sources. This note applies to all georeferenced/GIS planning datasets used within this plan update.

6.2.2 Risk Management Tool

The Risk Management Tool (RMT) was developed by North Carolina Emergency Management (NCEM)-Risk Management (RM) as a tool to simplify hazard mitigation plan development into a single, automated, tool-based format to include geospatially based risk assessment data, also developed by NCEM-RM. The RMT is a twofold system used to create and/or update a local and state hazard mitigation plan. The two parts of the RMT are a step-by-step system that will prompt a user to input information and narrative as well as upload pictures, documents and other information as needed. The second part of the system is the Risk Tool. The Risk Tool will run a risk assessment at the building level for certain hazards selected based on predetermined calculations for each hazard. Some hazards will have a single return period and others have multi-return periods. The availability of multi-returns periods are based on the availability of datasets for each hazard and the degree of detail in each dataset.

The Risk Assessment produced by the Risk Tool will also identify high-risk structures in the planning area and estimate cost by types of mitigation projects (wind retrofits, elevation, acquisition, mitigation reconstruction) and benefit-cost estimates by type of mitigation. The mitigation tool is only meant to begin the process of thinking about problem areas where mitigation may be of interest to the jurisdiction and property owners. It is also designed to drive mitigation actions that are specific, measurable, attainable, realistic and timely.

Finally, the Risk Management Tool also assesses vulnerable populations, such as children and elderly persons. Data used to assess these populations is from the US 2020 Decennial Census. According to the US Census Bureau, those defined as “elderly,” are 65 years old or older, while those defined as “children” are 5 years old or younger.

With all information combined in the system, a hazard mitigation plan can then be exported into multiple document formats. The system will also store the plan so that when it is time to update the documentation, the information is already in the system.

The RMT was originally developed as part of the Integrated Hazard Risk Management (IHRM) pilot project which included Durham, Edgecombe, Macon and New Hanover counties. The pilot was successful, and it was determined that there is a need and interest in a system designed to be used statewide and potentially nationwide in the future. The RMT used in this update was the second version created by NCEM.

A list of the hazards assessed by the RMT follows:

- Hurricane and Coastal Hazards
- Tornadoes/Thunderstorms
- Earthquakes
- Flooding
- Wildfires

All conclusions are presented in “**Conclusions on Hazard Vulnerability**” at the end of this section.

Hazard Prioritization

When it comes to evaluating hazards and determining which hazards a jurisdiction should spend the most time and effort addressing, a number of factors affect prioritization. As discussed in *Section 5: Hazard Profiles,* the risk (magnitude, probability, location) of a hazard is one of the primary driving forces that helps determine the relative importance of addressing the potential impacts of a hazard. However, the assessment of a hazard's risk is generally focused on the hazard itself and how severe or likely it could be within the geographic scope of the study area. This assessment does not necessarily analyze the potential effects of that hazard on humans and the built environment. This is a critical component of planning for hazards since a hazard that does not impact human life, safety, or welfare is typically not considered as important to address through mitigation. The analysis that follows attempts to bring this consideration into the planning process by estimating the impacts on humans and the built environment and prioritizing hazards accordingly.

6.3 EXPLANATION OF DATA SOURCES

Hurricane and Coastal Hazards

NCEM's Risk Management Tool assessed vulnerable areas to the Hurricane and Coastal Hazards. For this assessment, vulnerable buildings and populations were analyzed against damages caused by hurricane winds.

Tornadoes/Thunderstorms

NCEM's Risk Management Tool analyzed the vulnerable buildings and populations to the Tornadoes/Thunderstorms hazard. Sub-hazards assessed under the thunderstorms hazard include hail and lightning; however, for the purposes of this assessment, thunderstorm winds were the only risk analyzed.

Earthquakes

NCEM's Risk Management Tool assessed vulnerable areas to the earthquake hazard. This assessment included susceptible buildings by the type of structure, and the potential dollar losses associated with the buildings. It also analyzed susceptible populations, such as children and elderly.

Geological (Landslide)

Data from the U.S. Geological Survey was used to first determine what areas are considered high, moderate, or low susceptibility areas to the landslide hazard. Data was downloaded in an ArcGIS compatible format. This allowed the parcel data received by local governments to be layered on top of the landslide regions to assess vulnerability to landslide occurrences.

Flooding

FEMA Digital Flood Insurance Rate Maps (DFIRMs) were used to determine flood vulnerability. DFIRM data can be used in ArcGIS for mapping purposes and, they identify several features including floodplain boundaries and base flood elevations. Identified areas on the DFIRM represent some features of a Flood Insurance Rate Maps including the 100-year flood areas (1.0-percent annual chance flood), and the 500-year flood areas (0.2-percent annual chance flood). For the vulnerability assessment, local parcel data and critical facilities were overlaid on the 100-year floodplain areas and 500-year floodplain areas. This data was also supplemented with the NCEM RMT data, which assessed structure type and vulnerable

populations within the floodplain areas. It should be noted that such an analysis does account for building elevation.

Wildfires

The data used to determine vulnerability to wildfires in the Cabarrus Stanly Union Region is based on GIS data from the Southern Wildfire Risk Assessment (SWRA). A specific layer known as the "Wildland Urban Interface" (WUI) was used to determine vulnerability of people and property. This layer uses the key input of housing density to define potential wildfire impacts to people and homes. The WUI Risk Index is then derived from a scale of -1 to -9, with the least negative impact being a -1, and uses flame length to measure fire intensity. The primary purpose of this data is to highlight areas of concern that may be conducive to mitigation actions. Many assumptions are made, making it not a true probability; however, it does provide a comparison of risk throughout the region. Data was also supplemented with the data from NCEM's RMT, which assessed vulnerable buildings, potential dollar losses of those buildings, and susceptible populations.

Hazardous Substances

Hazardous materials incidents can occur in both fixed facilities and through mobile transportation. For the fixed incident analysis, Toxic Release Inventory (TRI) data was used. The Toxic Release Inventory is a publicly available database from the federal Environmental Protection Agency (EPA) that contains information on toxic chemicals, releases, and other waste management activities reported annually by certain covered industry groups, as well as federal facilities. This inventory was established under the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA) and was further expanded by the Pollution Prevention Act of 1990. Facilities that meet certain activity thresholds must annually report their releases and other waste management activities for listed toxic chemicals to the EPA and to their state or tribal entity. A facility must report if it meets the following criteria:

- The facility falls within one of the following industrial categories: manufacturing; metal mining; coal mining; electric generating facilities that combust coal and/or oil; chemical wholesale distributors; petroleum terminals and bulk storage facilities; RCRA Subtitle C treatment, storage, and disposal (TSD) facilities; and solvent recovery services;
- Has 10 or more full-time employee equivalents; and
- Manufactures or processes more than 25,000 pounds or otherwise uses more than 10,000 pounds of any listed chemical during the calendar year. Persistent, bioaccumulative, and toxic (PBT) chemicals are subject to different thresholds of 10 pounds, 100 pounds, or 0.1 grams depending on the chemical.

For the mobile hazardous materials incident analysis, transportation data including major highways and railroads were obtained from the North Carolina Department of Transportation. This data is ArcGIS compatible, lending itself to buffer analysis to determine risk.

6.4 ASSET INVENTORY

An inventory of geo-referenced assets within Cabarrus, Stanly, and Union Counties and jurisdictions was compiled in order to identify and characterize those properties potentially at risk to the identified hazards[3]. By understanding the type and number of assets that exist and where they are located in

[3] While potentially not all-inclusive for the jurisdictions in the Cabarrus Stanly Union region, "georeferenced" assets include

relation to known hazard areas, the relative risk and vulnerability for such assets can be assessed. Under this assessment, two categories of physical assets were created and then further assessed through GIS analysis. Additionally, social assets are addressed to determine population at risk to the identified hazards. These are presented below in Section 6.4.2.

6.4.1 Physical and Improved Assets

The two categories of physical assets consist of:

1. Improved Property: Includes all improved properties in the Cabarrus Stanly Union Region according to local parcel data provided by the counties. The information has been expressed in terms of the number of parcels and total assessed value of improvements (buildings) that may be exposed to the identified hazards.

2. Critical Facilities: Critical facilities vary by jurisdiction. Each county provided data from their respective critical facilities that were used in this section. Identified critical facilities are fire stations, police stations, medical care facilities, schools, government facilities, emergency operation centers, or other important buildings. It should be noted that this listing is not all-inclusive for assets located in the region, but it is anticipated that it will be expanded during future plan updates as more geo-referenced data becomes available for use in GIS analysis.

The following tables provide a detailed listing of the geo-referenced assets that have been identified for inclusion in the vulnerability assessment for the Cabarrus Stanly Union Region.

Table 6.1 lists the number of parcels, total value of parcels, total number of parcels with improvements, and the total assessed value of improvements for participating areas of the Cabarrus Stanly Union Region (study area of vulnerability assessment)[4]. For reference, the total area of the Cabarrus Stanly Union Region is approximately 901,657 acres, or 1,408 square miles. The U.S. Census Bureau also notes the following information for each county as of vintage year 2023:

- **Cabarrus County**
  - Land area in square miles (2020): 361.23
  - Population per square mile (2020): 625.1
  - Building permits (2023): 2,270
  - Total employer establishments (2022): 5,131

- **Stanly County**
  - Land area in square miles (2020): 395.08
  - Population per square mile (2020): 158.2
  - Building permits (2023): 349
  - Total employer establishments (2022): 1,458

- **Union County**
  - Land area in square miles (2020): 632.74

those assets for which specific location data is readily available for connecting the asset to a specific geographic location for purposes of GIS analysis.

[4] Total assessed values for improvements is based on tax assessor records as joined to digital parcel data. This data does not include dollar figures for tax-exempt improvements such as publicly-owned buildings and facilities. It should also be noted that, due to record keeping, some duplication is possible thus potentially resulting in an inflated value exposure for an area.

- Population per square mile (2020): 376.6
- Building permits (2023): 2,309
- Total employer establishments (2022): 5,582

TABLE 6.1: IMPROVED PROPERTY IN THE CABARRUS STANLY UNION REGION

Location[5]	Number of Parcels	Total Assessed Value of Parcels	Estimated Number of Buildings	Total Assessed Value of Improvements
Cabarrus County	**106,941**	**$48,327,305,896**	**77,604**	**$35,489,731,655**
Concord	41,990	$24,641,333,240	27,886	$18,504,616,520
Harrisburg	8,735	$4,748,861,050	3,947	$3,499,666,050
Kannapolis	24,925	$8,469,011,771	15,322	$6,282,926,370
Midland	3,003	$1,009,728,140	1,883	$667,707,170
Mount Pleasant	898	$403,124,640	950	$287,135,170
Unincorporated Area	27,390	$9,055,247,055	27,616	$6,247,680,375
Stanly County	**42,247**	**$7,369,985,294**	**39,625**	**$4,922,116,984**
Albemarle	9,387	$1,553,816,201	8,253	$1,268,521,614
Badin	914	$70,714,941	776	$54,916,417
Locust	3,129	$802,564,429	1,485	$504,488,843
Misenhiemer	158	$107,325,499	203	$97,211,165
New London	399	$81,630,374	438	$67,077,663
Norwood	2,389	$322,433,183	1,601	$194,847,913
Oakboro	1,495	$276,991,744	1,013	$224,123,825
Red Cross	506	$82,576,681	571	$59,096,424
Richfield	512	$104,162,599	457	$78,953,289
Stanfield	864	$178,011,770	823	$133,589,693
Unincorporated Area	22,494	$3,789,757,873	24,005	$2,239,290,138
Union County	**111,043**	**$36,726,401,500**	**98,023**	**$27,022,430,900**
Fairview	2,080	$676,349,310	2,596	$428,910,900
Hemby Bridge	854	$161,695,000	1,155	$117,578,800
Indian Trail	17,073	$5,383,787,000	13,256	$4,062,315,600
Lake Park	1,409	$357,793,800	1,273	$292,255,100
Marshville	1,218	$194,158,600	1,644	$148,411,900
Marvin	2,308	$1,542,910,700	1,760	$1,179,220,800
Mineral Springs	1,570	$418,157,600	1,863	$309,587,600
Monroe	15,742	$4,504,476,600	14,891	$3,319,374,000
Stallings	7,571	$2,354,935,300	5,905	$1,788,732,900
Unionville	3,051	$784,643,600	3,595	$560,701,000
Waxhaw	8,196	$3,118,343,000	3,791	$2,386,168,300
Weddington	4,814	$3,050,413,100	3,484	$2,295,642,800
Wesley Chapel	3,012	$1,279,096,600	2,685	$957,152,600
Wingate	1,174	$250,547,400	1,138	$208,399,400
Unincorporated Area	40,971	$12,649,093,890	38,987	$8,967,979,200
Cabarrus Stanly Union Regional Total	**260,231**	**$92,423,692,690**	**215,252**	**$67,434,279,539**

Source: Local governments

[5] Number of buildings for each jurisdiction is based on the approximate number of building footprints.

The following table lists the fire stations, police stations, emergency operations centers (EOCs), licensed medical care facilities, schools, and other critical facilities located in the Cabarrus Stanly Union Region as listed on NC OneMap[6]. Local governments at the county level provided a majority of the data for this analysis. In addition, **Figure 6.1** shows the locations of essential facilities in the Cabarrus Stanly Union Region. **Table 6.28**, at the end of this section, shows a complete list of the critical facilities by name, as well as the hazards that affect each facility. As noted previously, this list is not all inclusive and only includes information provided by the counties using georeferenced data and updated municipal boundaries.

TABLE 6.2: CRITICAL FACILITY INVENTORY IN THE CABARRUS STANLY UNION REGION

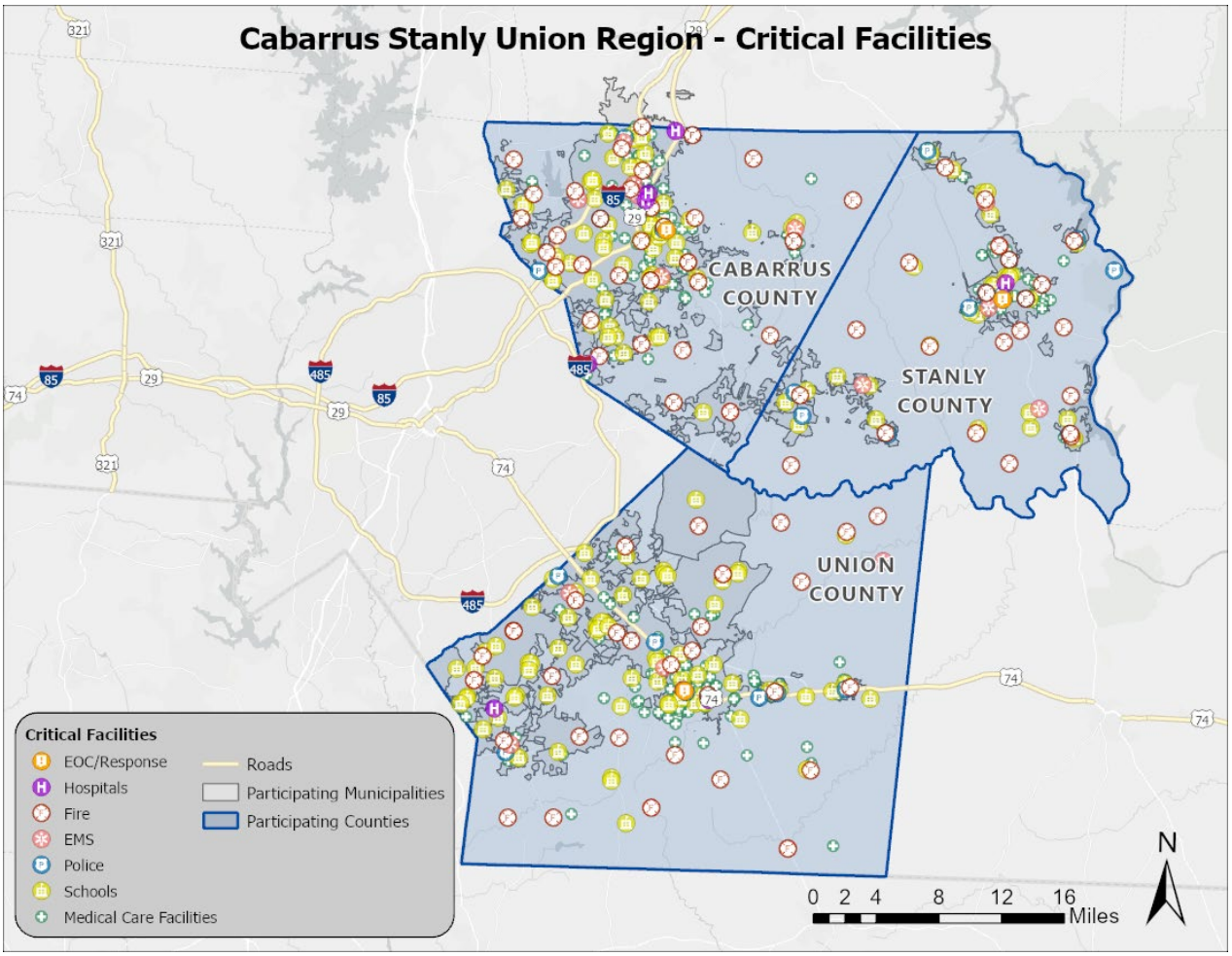
Location	Fire/EMS Stations	Police Stations	Medical Care Facilities	EOC	Schools	Other
Cabarrus County	**42**	**8**	**88**	**1**	**64**	**12**
Concord	22	7	52	1	33	9
Harrisburg	3	0	3	0	6	0
Kannapolis	5	1	18	0	14	2
Midland	3	0	0	0	1	0
Mount Pleasant	3	0	3	0	2	1
Unincorporated Area	6	0	12	0	8	0
Stanly County	**27**	**14**	**52**	**1**	**33**	**8**
Albemarle	7	7	44	1	13	7
Badin	1	1	0	0	1	0
Locust	1	1	0	0	2	0
Misenhiemer	0	1	0	0	2	0
New London	2	0	1	0	2	0
Norwood	3	1	2	0	2	0
Oakboro	2	1	1	0	1	0
Red Cross	0	0	0	0	2	0
Richfield	1	0	1	0	1	0
Stanfield	0	1	0	0	1	0
Unincorporated Area	10	1	3	0	6	1
Union County	**41**	**6**	**100**	**2**	**72**	**15**
Fairview	1	0	0	0	1	0
Hemby Bridge	1	0	0	0	0	0
Indian Trail	2	1	7	0	10	0
Lake Park	0	0	0	0	0	1
Marshville	2	1	3	0	3	1
Marvin	0	0	1	0	1	0
Mineral Springs	1	0	0	0	1	0
Monroe	10	1	57	2	14	8
Stallings	0	1	0	0	2	0
Unionville	2	0	3	0	4	2
Waxhaw	3	1	4	0	4	1
Weddington	3	0	0	0	1	0
Wesley Chapel	1	1	0	0	3	0

[6] NC OneMap: https://www.nconemap.gov/

Location	Fire/EMS Stations	Police Stations	Medical Care Facilities	EOC	Schools	Other
Wingate	1	0	3	0	2	0
Unincorporated Area	14	0	22	0	26	2
Cabarrus Stanly Union Regional Total	**110**	**28**	**240**	**4**	**169**	**35**

Source: Local governments, NC OneMap

FIGURE 6.1: CRITICAL FACILITIES IN THE CABARRUS STANLY UNION REGION



Source: Local governments, NC OneMap

6.4.2 Social Vulnerability

Social vulnerability is defined by FEMA through the National Risk Index methodology as "the susceptibility of social groups to the adverse impacts of hazards, including disproportionate death, injury, loss, or disruption of livelihood." In addition to identifying those assets potentially at risk to identified hazards, it is important to identify and assess members of the resident population in the Cabarrus Stanly Union Region that are potentially at higher risk to these hazards.

Table 6.3 lists the population by county according to U.S. Census Bureau population estimates. The population estimates are updated using the most recent vintage tables as per 2018-2022 American Community Survey (ACS) 5-Year Estimates findings. The total population in the Cabarrus Stanly Union Region according to Census data is reported as 529,228. Key factors that may provide additional insights regarding socially vulnerable populations of the region include spoken language, disability status, and poverty status listed in the table below.

According to the Social Vulnerability Index (SVI)[7] published by the Centers for Disease Control and Prevention (CDC), 2022 findings indicate relatively low levels of vulnerability between the counties in the Cabarrus Stanly Union Region. The overall SVI score for Cabarrus County is 0.2222 (low level of vulnerability) compared to 0.3838 (low to medium level of vulnerability) for Stanly County and 0.0303 (low level of vulnerability) for Union County. Additionally, the Environmental Justice Index (EJI)[8] published by the CDC ranks census tracts by level of environmental burden using quartiles from low to high. Cabarrus County contains roughly 9 tracts ranked as high and 7 ranked as moderate to high, whereas Stanly County contains 4 high and 4 moderate to high tracts, and Union County contains 6 high and 5 moderate to high tracts.

Additionally, the FEMA National Risk Index (NRI)[9] provides base ratings of risk index, social vulnerability, and community resilience by county using established and vetted assessment methodologies. Community resilience is defined by FEMA through the NRI methodology as "the ability of a community to prepare for anticipated hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions." This information is updated as of 2024, and associated tables and reports can be viewed using the NRI tool.

For Cabarrus County, the risk index rating is relatively low (80.11 out of 100) and social vulnerability is rated as relatively moderate (43.4 out of 100) compared to relatively high community resilience (72.6 out of 100). For Stanly County, the risk index rating is relatively low (56.89) and social vulnerability is rated as relatively moderate (55.4) compared to relatively moderate community resilience (57.4). For Union County, the risk index rating is relatively moderate (86.06) and social vulnerability is rated as relatively low (22.1) compared to relatively high community resilience (60.6).

TABLE 6.3: TOTAL POPULATION IN THE CABARRUS STANLY UNION REGION

Location	2022 Population Estimates	% population speaking a language other than English	% population with a disability	% population below the poverty level
Cabarrus County	226,396	13.8%	10.7%	7.5%
Stanly County	62,723	6.5%	17.1%	13.8%
Union County	240,109	15.6%	9.2%	6.8%
Cabarrus Stanly Union Regional Total	**529,228**	--	--	--

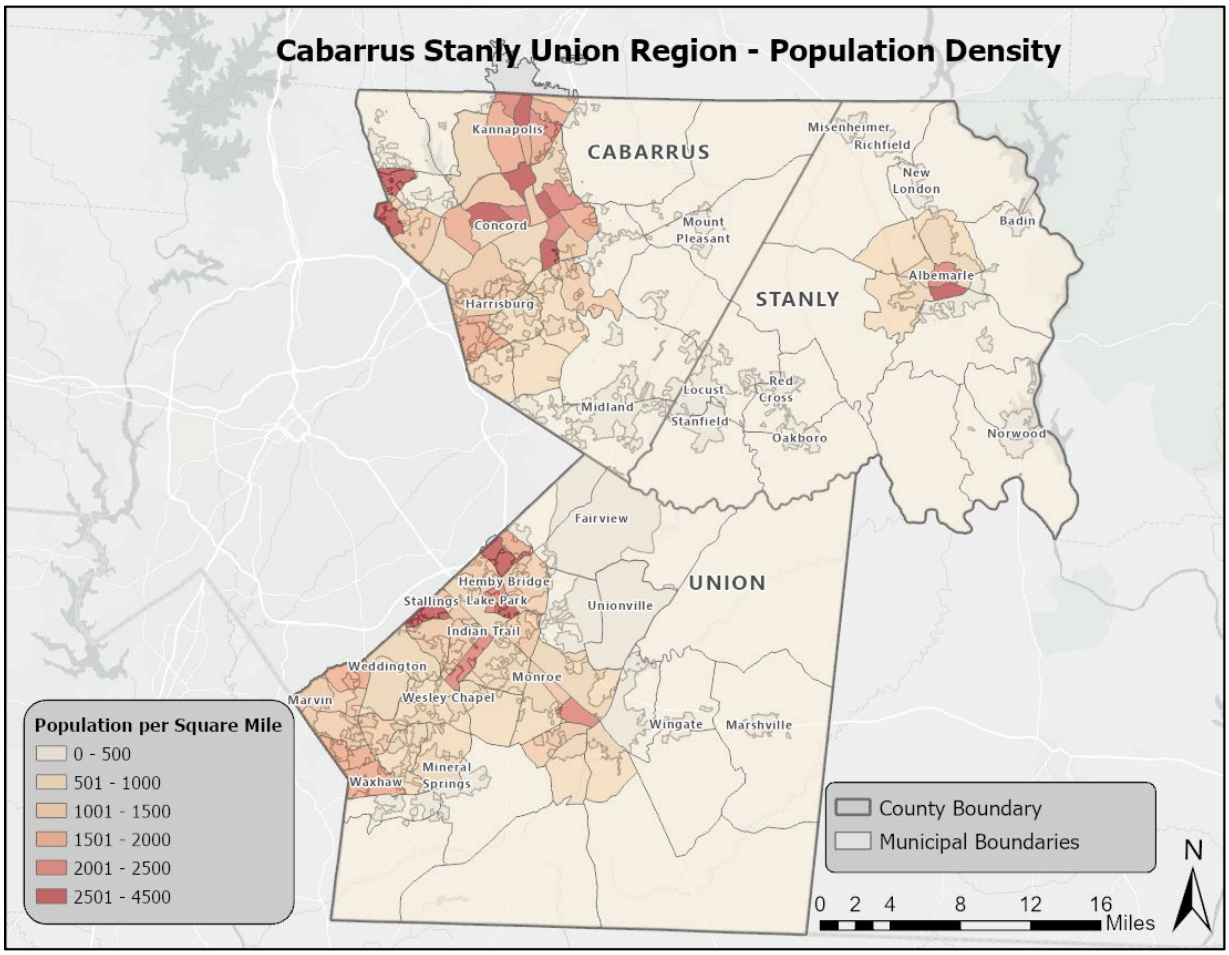
Source: US Census Bureau, 2022 ACS 5-Year Estimates

Additional population estimates are presented in **Section 3: *Community Profile***.

In addition, **Figure 6.2** illustrates the population density by census tract for each county as it was reported by the US Census Bureau in the 2020 Decennial Census.

[7] CDC/ATSDR Social Vulnerability Index: https://www.atsdr.cdc.gov/placeandhealth/svi/index.html
[8] CDC/ATSDR Environmental Justice Index: https://www.atsdr.cdc.gov/placeandhealth/eji/index.html
[9] FEMA National Risk Index: https://hazards.fema.gov/nri/

FIGURE 6.2: POPULATION DENSITY IN THE CABARRUS STANLY UNION REGION



Source: US Census Bureau

6.4.3. Development Trends and Changes in Vulnerability

Since the previous regional hazard mitigation plan was approved (in 2020), the Cabarrus Stanly Union Region has experienced strong growth and development. **Table 6.4** shows the number of building units constructed since 2010 and 1970 compared to recently updated totals by jurisdiction according to the US Census Bureau.

TABLE 6.4: BUILDING COUNTS FOR THE CABARRUS STANLY UNION REGION

Location	Total Housing Units (2022)	Units Built 2010 or Later	% Building Stock Built Post-2010	Units Built 1970 or Later	% Building Stock Built Post-1970
Cabarrus County	**88,031**	**16,751**	**19.0%**	**66,764**	**75.8%**
Concord	41,988	8,752	20.8%	32,851	78.2%
Harrisburg	5,780	1,857	32.1%	5,459	94.4%
Kannapolis	22,068	4,102	18.6%	12,716	57.6%
Midland	1,633	580	35.5%	1,331	81.5%
Mount Pleasant	844	100	11.8%	521	61.7%
Unincorporated Area	15,718	1,360	8.7%	13,886	88.3%

Location	Total Housing Units (2022)	Units Built 2010 or Later	% Building Stock Built Post-2010	Units Built 1970 or Later	% Building Stock Built Post-1970
Stanly County	**27,802**	**1,949**	**7.0%**	**15,322**	**55.1%**
Albemarle	7,901	351	4.4%	3,262	41.3%
Badin	540	0	0.0%	100	18.5%
Locust	2,102	691	32.9%	1,660	79.0%
Misenhiemer	134	2	1.5%	47	35.1%
New London	271	20	7.4%	126	46.5%
Norwood	1,444	39	2.7%	565	39.1%
Oakboro	929	106	11.4%	565	60.8%
Red Cross	316	28	8.9%	243	76.9%
Richfield	352	15	4.3%	187	53.1%
Stanfield	605	25	4.1%	410	67.8%
Unincorporated Area	13,208	672	5.1%	8,157	61.8%
Union County	**84,798**	**13,975**	**16.5%**	**74,341**	**87.7%**
Fairview	1,358	112	8.2%	1,002	73.8%
Hemby Bridge	752	39	5.2%	469	62.4%
Indian Trail	13,789	2,599	18.8%	13,127	95.2%
Lake Park	1,319	28	2.1%	1,319	100.0%
Marshville	983	39	4.0%	491	49.9%
Marvin	1,883	345	18.3%	1,883	100.0%
Mineral Springs	1,304	210	16.1%	1,214	93.1%
Monroe	12,621	790	6.3%	9,484	75.1%
Stallings	5,977	1,063	17.8%	5,706	95.5%
Unionville	2,451	185	7.5%	2,129	86.9%
Waxhaw	6,548	2,849	43.5%	6,400	97.7%
Weddington	4,356	947	21.7%	4,219	96.9%
Wesley Chapel	2,879	522	18.1%	2,724	94.6%
Wingate	1,016	0	0.0%	733	72.1%
Unincorporated Area	27,562	4,247	15.4%	23,441	85.0%
Cabarrus Stanly Union Regional Total	**200,631**	**32,675**	**16.3%**	**156,427**	**78.0%**

Source: US Census Bureau, 2022 ACS 5-Year Estimates

Table 6.5 shows population growth estimates for the region from 2010 to 2022, with growth rates between 2010 and 2020, based on the US Census Decennial data and 2022 ACS 5-Year population estimates.

TABLE 6.5: POPULATION GROWTH FOR THE CABARRUS STANLY UNION REGION

Location	2010	2020	2021	2022	% Change 2010-2020
Cabarrus County	**178,535**	**225,804**	**221,200**	**226,396**	**26.5%**
Concord	75,172	105,240	102,566	105,335	40.0%
Harrisburg	10,328	18,967	18,415	18,934	83.6%
Kannapolis	41,663	53,114	52,173	52,314	27.5%
Midland	2,978	4,684	4,519	4,675	57.3%
Mount Pleasant	1,727	1,671	1,981	1,776	-3.2%

Location	2010	2020	2021	2022	% Change 2010-2020
Unincorporated Area	46,667	42,128	41,546	43,362	-9.7%
Stanly County	**60,585**	**62,504**	**62,148**	**62,723**	**3.2%**
Albemarle	15,912	16,432	16,318	16,444	3.3%
Badin	1,774	2,024	1,919	2,075	14.1%
Locust	2,959	4,537	4,275	4,700	53.3%
Misenhiemer	920	650	702	652	-29.3%
New London	621	607	660	674	-2.3%
Norwood	2,122	2,367	2,648	2,906	11.5%
Oakboro	1,912	2,128	2,319	2,379	11.3%
Red Cross	740	762	686	677	3.0%
Richfield	464	582	871	921	25.4%
Stanfield	1,573	1,585	1,453	1,463	0.8%
Unincorporated Area	31,588	30,830	30,297	29,832	-2.4%
Union County	**201,292**	**238,267**	**235,699**	**240,109**	**18.4%**
Fairview	3,323	3,456	3,475	3,512	4.0%
Hemby Bridge	1,570	1,614	1,957	1,924	2.8%
Indian Trail	30,362	39,997	39,603	40,325	31.7%
Lake Park	3,243	3,269	3,317	3,342	0.8%
Marshville	2,391	2,522	2,533	2,565	5.5%
Marvin	4,889	6,358	6,326	6,421	30.0%
Mineral Springs	2,553	3,159	3,129	3,185	23.7%
Monroe	32,297	34,562	34,464	34,897	7.0%
Stallings	12,682	16,112	15,932	16,193	27.0%
Unionville	5,853	6,643	6,634	6,694	13.5%
Waxhaw	8,754	20,534	19,645	20,665	134.6%
Weddington	9,207	13,181	12,851	13,173	43.2%
Wesley Chapel	6,702	8,681	8,661	8,763	29.5%
Wingate	3,398	4,055	3,830	4,061	19.3%
Unincorporated Area	74,068	74,124	73,342	74,389	0.1%
Cabarrus Stanly Union Regional Total	**440,412**	**526,575**	**519,047**	**529,228**	**19.6%**

Source: US Census Bureau

Based on the above data, the rate of residential development and population growth in the region since 2010 has increased, most dramatically in Cabarrus and Union Counties. The overall population increased slightly in Stanly County, too, but has decreased in some of the participating jurisdictions. Changes in development can significantly impact the region's vulnerability since the last plan update cycle. The greater the population, the greater the risk is that people are impacted by hazards. It should be noted that if future development occurs in vulnerable areas, populations and infrastructure will be increasingly exposed to potential hazards.

6.5 VULNERABILITY ASSESSMENT RESULTS

As noted earlier, only hazards with a specific geographic boundary, modeling tool, or sufficient historical data allow for further analysis. Those results are presented here. All other hazards are assumed to impact the entire planning region (drought, excessive heat, hailstorm, lightning, and severe winter weather) or, due to lack of authoritative data, analysis would not lead to credible results (sinkholes, erosion, dam failure, infectious disease, terrorism, cyber, EMP). The total region exposure of critical facilities, and thus risk, was presented in **Table 6.28**.

The annualized loss estimate for all hazards is presented at the end of this section in **Table 6.26.** For additional information related to vulnerability and expected annual losses for a wide range of hazards, the FEMA NRI[10] is a publicly available online tool that allows users to create reports and download data for both county and census tract geographies.

The hazards presented in this subsection include: hurricane and coastal hazards, tornadoes/thunderstorms, earthquakes, landslides, flooding, wildfires, hazardous substances and dam failures.

6.5.1. Hurricane and Coastal Hazards

Historical evidence indicates that the Cabarrus Stanly Union Region has a significant risk to the hurricane and tropical storm hazard, mostly due to the location of the state of North Carolina. In recent years, there have been five disaster declarations from hurricanes and tropical storms in the region (Hurricane Hugo, Hurricane Fran, Hurricane Floyd, Tropical Storm Frances, and Hurricane Florence). Many more storm tracks have come near or traversed through the region, as shown and discussed in **Section 5: Hazard Profiles**.

Numerous secondary hazards, such as erosion, flooding, tornadoes, and high winds, tend to be a result of hurricanes or tropical storms. These cumulative effects often make potential loss estimates difficult to calculate and track.

NCEM's Risk Management Tool (RMT) analyzes hurricane winds and no other hazards often associated with hurricanes; therefore, only hurricane winds are analyzed in this section. Building and population vulnerabilities to hurricane winds in a 100-year frequency event (return period) are reported in the following **Table 6.6** and **Table 6.7**.

It is assumed that all existing and future buildings and populations are at risk from hurricanes and coastal hazards.

TABLE 6.6: BUILDING VULNERABILITIES TO HURRICANE WINDS

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**39,349**	**74,586**	**$24,519,683**	**6,843**	**$13,687,721**	**1,535**	**$3,264,712**	**82,964**	**$41,472,116**
Concord	9,968	24,811	$9,111,389	2,540	$8,852,497	576	$1,375,608	27,927	$19,339,494
Harrisburg	3,298	3,354	$1,441,852	650	$625,986	110	$215,649	4,114	$2,283,488
Kannapolis	16,838	18,848	$6,242,571	1,431	$1,474,130	431	$954,165	20,710	$8,670,866

[10] FEMA National Risk Index: https://hazards.fema.gov/nri/

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Midland	1,144	1,629	$391,872	157	$117,365	30	$32,524	1,816	$541,760
Mount Pleasant	1,499	1,568	$372,258	143	$151,951	53	$30,571	1,764	$554,780
Unincorporated Area	6,602	24,376	$6,959,741	1,922	$2,465,792	335	$656,195	26,633	$10,081,728
Stanly County	**29,570**	**34,111**	**$11,356,985**	**4,294**	**$3,391,399**	**791**	**$1,054,104**	**39,196**	**$15,802,488**
Albemarle	6,685	6,554	$1,569,497	1,388	$376,840	214	$178,987	8,156	$2,125,324
Badin	762	646	$136,090	86	$120,663	34	$28,976	766	$285,728
Locust	1,582	1,527	$382,124	232	$88,911	36	$43,788	1,795	$514,823
Misenhiemer	169	158	$40,138	11	$1,918	29	$29,292	198	$71,348
New London	703	647	$255,771	80	$82,578	25	$8,193	752	$346,542
Norwood	2,080	1,918	$1,286,882	206	$339,951	45	$152,892	2,169	$1,779,725
Oakboro	1,237	1,186	$309,334	205	$88,769	39	$20,441	1,430	$418,543
Red Cross	397	513	$142,238	39	$7,984	15	$23,058	567	$173,281
Richfield	930	877	$205,046	141	$41,391	24	$5,223	1,042	$251,661
Stanfield	891	862	$228,078	125	$127,648	23	$5,732	1,010	$361,458
Unincorporated Area	14,134	19,223	$6,801,787	1,781	$2,114,746	307	$557,522	21,311	$9,474,055
Union County	**33,932**	**82,141**	**$42,737,884**	**5,880**	**$13,728,681**	**1,385**	**$5,212,625**	**89,406**	**$61,679,188**
Fairview	1,248	2,213	$781,330	166	$282,131	63	$97,200	2,442	$1,160,660
Hemby Bridge	631	852	$171,467	62	$45,937	25	$17,467	939	$234,872
Indian Trail	2,038	11,266	$3,404,024	854	$549,276	115	$43,775	12,235	$3,997,075
Lake Park	3	1,182	$363,284	14	$55,262	5	$535	1,201	$419,081
Marshville	1,491	1,535	$1,028,774	220	$362,535	43	$479,978	1,798	$1,871,287
Marvin	143	1,598	$1,410,859	42	$49,696	10	$13,989	1,650	$1,474,544
Mineral Springs	642	1,377	$286,446	96	$67,142	31	$16,985	1,504	$370,573
Monroe	7,037	11,060	$5,319,444	1,754	$1,234,485	244	$1,304,436	13,058	$7,858,365
Stallings	2,078	5,120	$1,885,982	365	$132,051	22	$9,142	5,507	$2,027,174
Unionville	1,733	3,134	$1,344,377	190	$598,959	108	$162,397	3,432	$2,105,733
Waxhaw	676	3,099	$997,581	187	$71,525	35	$18,596	3,321	$1,087,703
Weddington	673	3,520	$2,119,562	107	$147,846	59	$25,210	3,686	$2,292,617
Wesley Chapel	440	2,715	$1,138,183	36	$38,857	29	$39,161	2,780	$1,216,201
Wingate	536	902	$663,822	41	$13,697	64	$128,326	1,007	$805,844
Unincorporated Area	14,563	32,568	$21,822,749	1,746	$10,079,282	532	$2,855,428	34,846	$34,757,459
Cabarrus Stanly Union Regional Total	**102,851**	**190,838**	**$78,614,552**	**17,017**	**$30,807,801**	**3,711**	**$9,531,441**	**211,566**	**$118,953,792**

Source: NCEM Risk Management Tool

TABLE 6.7: POPULATION VULNERABILITIES TO HURRICANE WINDS

Location	Elderly at Risk	Children at Risk	Total at Risk
Cabarrus County	**31,114**	**15,471**	**236,653**
Concord	11,320	6,155	89,596
Harrisburg	1,589	803	15,355
Kannapolis	7,330	3,498	47,956
Midland	234	95	1,929
Mount Pleasant	239	47	1,271
Unincorporated Area	10,402	4,873	80,546
Stanly County	**12,159**	**3,471**	**64,032**

Location	Elderly at Risk	Children at Risk	Total at Risk
Albemarle	2,485	626	10,832
Badin	58	12	292
Locust	494	145	2,783
Misenhiemer	26	7	140
New London	121	55	743
Norwood	217	60	1,293
Oakboro	175	38	905
Red Cross	148	34	750
Richfield	163	43	889
Stanfield	158	51	1,063
Unincorporated Area	8,114	2,400	44,342
Union County	**30,145**	**13,646**	**240,914**
Fairview	777	167	4,619
Hemby Bridge	402	274	3,573
Indian Trail	3,578	2,174	29,870
Lake Park	265	131	1,934
Marshville	190	45	918
Marvin	486	268	7,498
Mineral Springs	475	198	4,630
Monroe	3,972	1,692	28,795
Stallings	1,635	957	12,458
Unionville	1,133	260	6,921
Waxhaw	1,195	772	13,371
Weddington	1,768	839	16,171
Wesley Chapel	841	456	9,516
Wingate	74	51	622
Unincorporated Area	13,354	5,362	100,018
Cabarrus Stanly Union Regional Total	**73,418**	**32,588**	**541,599**

Source: NCEM Risk Management Tool

SOCIAL VULNERABILITY

Given the equal susceptibility across the entire Cabarrus Stanly Union Region, it can be assumed that the entire population is at risk from hurricanes and coastal hazards. Timely sheltering/evacuations of elderly and young individuals, disabled individuals, and individuals requiring specialized care or equipment are of critical importance to reducing risk during a severe hurricane.

CRITICAL FACILITIES

Given equal vulnerability across the Cabarrus Stanly Union Region, all critical facilities are considered to be at risk. Although some buildings may perform better than others in the face of such an event due to construction, age, and other factors, determining individual building response is beyond the scope of this plan. However, this plan will consider mitigation actions for vulnerable structures, including critical facilities, to reduce the impacts of the hurricane wind hazard. A list of specific critical facilities and their associated risk can be found in **Table 6.28** at the end of this section.

In conclusion, a hurricane event has the potential to impact many existing and future buildings, critical facilities, and populations in the Cabarrus Stanly Union Region. Hurricane events can cause

substantial damage in their wake including numerous fatalities, road closures, water contamination, gas leaks, extensive debris clean-up, and extended power outages.

6.5.2 Tornadoes/Thunderstorms

Tornadoes

A probabilistic scenario was created to estimate building and population vulnerabilities in the Cabarrus Stanly Union region for the tornado hazard. For this scenario, a tornado ranked F2 on the Fujita scale was analyzed. The Risk Management Tool analyzed this information which has been reported in **Table 6.8** and **Table 6.9**.

TABLE 6.8: BUILDING VULNERABILITY TO THE TORNADOES HAZARD

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**39,349**	**74,586**	**$8,742,387,899**	**6,843**	**$6,740,809,158**	**1,535**	**$1,554,583,104**	**82,964**	**$17,037,780,160**
Concord	9,968	24,811	$3,221,556,718	2,540	$3,846,849,929	576	$661,789,159	27,927	$7,730,195,805
Harrisburg	3,298	3,354	$511,781,898	650	$438,059,825	110	$115,054,213	4,114	$1,064,895,935
Kannapolis	16,838	18,848	$2,021,324,447	1,431	$1,007,143,054	431	$421,753,442	20,710	$3,450,220,943
Midland	1,144	1,629	$158,772,018	157	$100,218,483	30	$23,195,954	1,816	$282,186,456
Mount Pleasant	1,499	1,568	$144,084,088	143	$86,057,302	53	$38,252,495	1,764	$268,393,885
Unincorporated Area	6,602	24,376	$2,684,868,730	1,922	$1,262,480,565	335	$294,537,841	26,633	$4,241,887,136
Stanly County	**29,570**	**34,111**	**$3,122,037,385**	**4,294**	**$1,723,904,599**	**791**	**$468,387,477**	**39,196**	**$5,314,329,462**
Albemarle	6,685	6,554	$593,064,088	1,388	$557,856,033	214	$135,727,965	8,156	$1,286,648,086
Badin	762	646	$49,611,345	86	$72,583,203	34	$44,002,275	766	$166,196,824
Locust	1,582	1,527	$138,837,063	232	$76,563,731	36	$25,490,251	1,795	$240,891,044
Misenhiemer	169	158	$13,208,091	11	$1,865,242	29	$29,572,757	198	$44,646,090
New London	703	647	$84,718,946	80	$61,819,200	25	$10,818,525	752	$157,356,671
Norwood	2,080	1,918	$179,963,316	206	$63,464,456	45	$20,270,489	2,169	$263,698,261
Oakboro	1,237	1,186	$102,556,274	205	$74,943,966	39	$14,522,533	1,430	$192,022,773
Red Cross	397	513	$48,529,535	39	$7,916,604	15	$16,989,639	567	$73,435,778
Richfield	930	877	$78,277,097	141	$50,651,726	24	$9,264,120	1,042	$138,192,943
Stanfield	891	862	$83,734,854	125	$61,279,807	23	$7,358,224	1,010	$152,372,885
Unincorporated Area	14,134	19,223	$1,749,536,776	1,781	$694,960,631	307	$154,370,699	21,311	$2,598,868,107
Union County	**33,936**	**82,166**	**$11,955,092,402**	**5,880**	**$3,640,202,459**	**1,385**	**$1,039,773,671**	**89,431**	**$16,635,068,534**
Fairview	1,248	2,213	$295,806,538	166	$130,296,700	63	$43,513,341	2,442	$469,616,580
Hemby Bridge	631	852	$69,724,647	62	$17,745,052	25	$8,126,226	939	$95,595,926
Indian Trail	2,038	11,266	$1,411,241,318	854	$420,239,990	115	$66,027,430	12,235	$1,897,508,738
Lake Park	3	1,182	$144,682,742	14	$14,574,820	5	$1,576,315	1,201	$160,833,877
Marshville	1,491	1,535	$142,951,322	220	$88,299,877	43	$37,195,621	1,798	$268,446,819
Marvin	143	1,606	$572,960,160	42	$18,068,482	10	$9,598,423	1,658	$600,627,066
Mineral Springs	642	1,377	$143,063,827	96	$47,008,128	31	$10,170,713	1,504	$200,242,668
Monroe	7,037	11,060	$1,183,462,749	1,754	$976,496,135	244	$175,414,425	13,058	$2,335,373,309
Stallings	2,078	5,120	$727,485,959	365	$170,524,471	22	$8,147,118	5,507	$906,157,548
Unionville	1,733	3,134	$411,790,873	190	$213,385,505	108	$75,716,803	3,432	$700,893,181
Waxhaw	676	3,100	$479,209,178	187	$59,117,980	35	$20,199,946	3,322	$558,527,104
Weddington	673	3,520	$912,384,476	107	$40,657,219	59	$46,110,674	3,686	$999,152,369
Wesley Chapel	440	2,715	$510,824,169	36	$22,788,506	29	$20,198,448	2,780	$553,811,123
Wingate	536	902	$102,173,339	41	$8,740,090	64	$47,289,451	1,007	$158,202,880

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Unincorporated Area	14,567	32,584	$4,847,331,105	1,746	$1,412,259,504	532	$470,488,737	34,862	$6,730,079,346
Cabarrus Stanly Union Regional Total	**102,855**	**190,863**	**$23,819,517,686**	**17,017**	**$12,104,916,216**	**3,711**	**$3,062,744,252**	**211,591**	**$38,987,178,156**

Source: NCEM Risk Management Tool

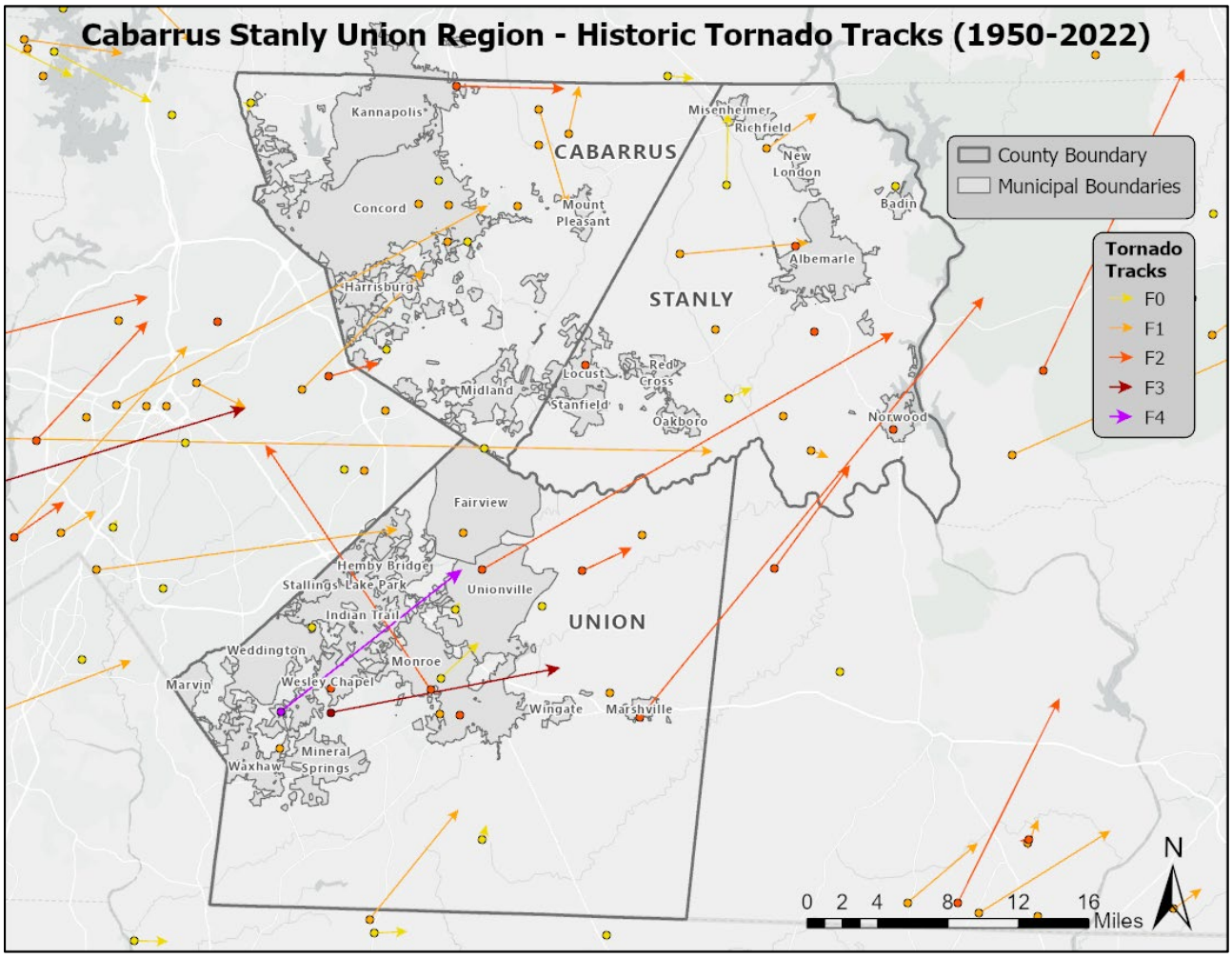
TABLE 6.9: POPULATION VULNERABILITY TO THE TORNADOES HAZARD

Location	Elderly at Risk	Children at Risk	Total at Risk
Cabarrus County	**31,114**	**15,471**	**236,653**
Concord	11,320	6,155	89,596
Harrisburg	1,589	803	15,355
Kannapolis	7,330	3,498	47,956
Midland	234	95	1,929
Mount Pleasant	239	47	1,271
Unincorporated Area	10,402	4,873	80,546
Stanly County	**12,159**	**3,471**	**64,032**
Albemarle	2,485	626	10,832
Badin	58	12	292
Locust	494	145	2,783
Misenhiemer	26	7	140
New London	121	55	743
Norwood	217	60	1,293
Oakboro	175	38	905
Red Cross	148	34	750
Richfield	163	43	889
Stanfield	158	51	1,063
Unincorporated Area	8,114	2,400	44,342
Union County	**30,154**	**13,650**	**241,005**
Fairview	777	167	4,619
Hemby Bridge	402	274	3,573
Indian Trail	3,578	2,174	29,870
Lake Park	265	131	1,934
Marshville	190	45	918
Marvin	488	269	7,536
Mineral Springs	475	198	4,630
Monroe	3,972	1,692	28,795
Stallings	1,635	957	12,458
Unionville	1,133	260	6,921
Waxhaw	1,195	772	13,375
Weddington	1,768	839	16,171
Wesley Chapel	841	456	9,516
Wingate	74	51	622
Unincorporated Area	13,361	5,365	100,067
Cabarrus Stanly Union Regional Total	**73,427**	**32,592**	**541,690**

Source: NCEM Risk Management Tool

A map of historical tornado points of origin and paths can be seen below in **Figure 6.3.**

FIGURE 6.3: HISTORICAL TORNADO TRACKS IN THE CABARRUS STANLY UNION REGION



Source: NCEM Risk Management Tool

Thunderstorms

A probabilistic scenario was created to estimate building and population vulnerabilities in the Cabarrus Stanly Union Region for the thunderstorm hazard. For this scenario, damages due to thunderstorm winds on a 50-year frequency event (return period) were analyzed. It is important to note that this data does not include potential damages caused by other remnants of thunderstorms, such as lightning or hail. The RMT analyzed this information which has been reported below in **Table 6.10** and **Table 6.11**.

TABLE 6.10: BUILDING VULNERABILITY TO THUNDERSTORM WINDS

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**39,349**	**74,586**	**$24,744,365**	**6,843**	**$13,764,592**	**1,535**	**$3,280,289**	**82,964**	**$41,789,246**
Concord	9,968	24,811	$9,111,389	2,540	$8,852,497	576	$1,375,608	27,927	$19,339,494

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Harrisburg	3,298	3,354	$1,441,852	650	$625,986	110	$215,649	4,114	$2,283,488
Kannapolis	16,838	18,848	$6,242,571	1,431	$1,474,130	431	$954,165	20,710	$8,670,866
Midland	1,144	1,629	$391,872	157	$117,365	30	$32,524	1,816	$541,760
Mount Pleasant	1,499	1,568	$372,258	143	$151,951	53	$30,571	1,764	$554,780
Unincorporated Area	6,602	24,376	$7,184,423	1,922	$2,542,663	335	$671,772	26,633	$10,398,858
Stanly County	**29,570**	**34,111**	**$13,674,959**	**4,294**	**$4,564,143**	**791**	**$1,415,895**	**39,196**	**$19,654,998**
Albemarle	6,685	6,554	$2,581,391	1,388	$734,957	214	$365,998	8,156	$3,682,345
Badin	762	646	$214,926	86	$262,171	34	$60,736	766	$537,832
Locust	1,582	1,527	$421,570	232	$96,817	36	$70,832	1,795	$589,219
Misenhiemer	169	158	$63,076	11	$3,501	29	$58,544	198	$125,121
New London	703	647	$412,726	80	$139,336	25	$16,583	752	$568,645
Norwood	2,080	1,918	$799,014	206	$194,334	45	$84,152	2,169	$1,077,500
Oakboro	1,237	1,186	$504,946	205	$161,955	39	$38,223	1,430	$705,125
Red Cross	397	513	$228,674	39	$16,689	15	$48,740	567	$294,104
Richfield	930	877	$329,720	141	$85,172	24	$10,018	1,042	$424,911
Stanfield	891	862	$291,557	125	$162,654	23	$9,833	1,010	$464,044
Unincorporated Area	14,134	19,223	$7,827,359	1,781	$2,706,557	307	$652,236	21,311	$11,186,152
Union County	**33,932**	**82,141**	**$34,782,709**	**5,880**	**$9,158,910**	**1,385**	**$2,959,005**	**89,406**	**$46,900,624**
Fairview	1,248	2,213	$781,330	166	$282,131	63	$97,200	2,442	$1,160,660
Hemby Bridge	631	852	$171,467	62	$45,937	25	$17,467	939	$234,872
Indian Trail	2,038	11,266	$3,404,024	854	$549,276	115	$43,775	12,235	$3,997,075
Lake Park	3	1,182	$363,284	14	$55,262	5	$535	1,201	$419,081
Marshville	1,491	1,535	$664,315	220	$193,120	43	$293,451	1,798	$1,150,887
Marvin	143	1,598	$1,410,859	42	$49,696	10	$13,989	1,650	$1,474,544
Mineral Springs	642	1,377	$286,446	96	$67,142	31	$16,985	1,504	$370,573
Monroe	7,037	11,060	$3,479,070	1,754	$754,647	244	$490,219	13,058	$4,723,935
Stallings	2,078	5,120	$1,885,982	365	$132,051	22	$9,142	5,507	$2,027,174
Unionville	1,733	3,134	$1,401,050	190	$674,608	108	$249,137	3,432	$2,324,795
Waxhaw	676	3,099	$997,581	187	$71,525	35	$18,596	3,321	$1,087,703
Weddington	673	3,520	$2,119,562	107	$147,846	59	$25,210	3,686	$2,292,617
Wesley Chapel	440	2,715	$1,138,183	36	$38,857	29	$39,161	2,780	$1,216,201
Wingate	536	902	$412,278	41	$6,885	64	$67,286	1,007	$486,449
Unincorporated Area	14,563	32,568	$16,267,278	1,746	$6,089,927	532	$1,576,852	34,846	$23,934,058
Cabarrus Stanly Union Regional Total	**102,851**	**190,838**	**$73,202,033**	**17,017**	**$27,487,645**	**3,711**	**$7,655,189**	**211,566**	**$108,344,868**

Source: NCEM Risk Management Tool

TABLE 6.11: POPULATION VULNERABILITY TO THUNDERSTORM WINDS

Location	Elderly at Risk	Children at Risk	Total at Risk
Cabarrus County	**31,114**	**15,471**	**236,653**
Concord	11,320	6,155	89,596
Harrisburg	1,589	803	15,355
Kannapolis	7,330	3,498	47,956
Midland	234	95	1,929

Location	Elderly at Risk	Children at Risk	Total at Risk
Mount Pleasant	239	47	1,271
Unincorporated Area	10,402	4,873	80,546
Stanly County	**12,159**	**3,471**	**64,032**
Albemarle	2,485	626	10,832
Badin	58	12	292
Locust	494	145	2,783
Misenhiemer	26	7	140
New London	121	55	743
Norwood	217	60	1,293
Oakboro	175	38	905
Red Cross	148	34	750
Richfield	163	43	889
Stanfield	158	51	1,063
Unincorporated Area	8,114	2,400	44,342
Union County	**30,145**	**13,646**	**240,914**
Fairview	777	167	4,619
Hemby Bridge	402	274	3,573
Indian Trail	3,578	2,174	29,870
Lake Park	265	131	1,934
Marshville	190	45	918
Marvin	486	268	7,498
Mineral Springs	475	198	4,630
Monroe	3,972	1,692	28,795
Stallings	1,635	957	12,458
Unionville	1,133	260	6,921
Waxhaw	1,195	772	13,371
Weddington	1,768	839	16,171
Wesley Chapel	841	456	9,516
Wingate	74	51	622
Unincorporated Area	13,354	5,362	100,018
Cabarrus Stanly Union Regional Total	**73,418**	**32,588**	**541,599**

Source: NCEM Risk Management Tool

SOCIAL VULNERABILITY

It is assumed that all existing populations and future populations are at risk of the tornadoes/thunderstorms hazard. Timely sheltering/evacuations of elderly and young individuals, disabled individuals, and individuals requiring specialized care or equipment are of critical importance to reducing risk during a severe tornado or thunderstorm event.

CRITICAL FACILITIES

All critical facilities should still be considered at-risk of damage should an event occur. A list of all individual critical facilities in the region can be found in **Table 6.28**.

6.5.3. Earthquakes

A probabilistic scenario was created to estimate building and population vulnerabilities in the Cabarrus Stanly Union region for the earthquake hazard with a 500-year frequency (return period). The RMT analyzed this information which has been reported below in **Table 6.12** and **Table 6.13**.

TABLE 6.12: BUILDING VULNERABILITY TO THE EARTHQUAKE HAZARD

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**39,349**	**74,586**	**$11,942,422**	**6,843**	**$22,453,759**	**1,535**	**$5,391,661**	**82,964**	**$39,787,841**
Concord	9,968	24,811	$4,691,928	2,540	$12,901,541	576	$2,373,371	27,927	$19,966,840
Harrisburg	3,298	3,354	$699,175	650	$1,500,432	110	$414,821	4,114	$2,614,428
Kannapolis	16,838	18,848	$2,719,534	1,431	$3,453,247	431	$1,381,467	20,710	$7,554,248
Midland	1,144	1,629	$229,988	157	$325,011	30	$94,063	1,816	$649,061
Mount Pleasant	1,499	1,568	$197,566	143	$292,879	53	$136,342	1,764	$626,787
Unincorporated Area	6,602	24,376	$3,404,231	1,922	$3,980,649	335	$991,597	26,633	$8,376,477
Stanly County	**29,570**	**34,111**	**$4,255,226**	**4,294**	**$5,717,388**	**791**	**$1,500,208**	**39,196**	**$11,472,819**
Albemarle	6,685	6,554	$774,865	1,388	$1,932,280	214	$444,057	8,156	$3,151,202
Badin	762	646	$56,562	86	$204,986	34	$123,880	766	$385,428
Locust	1,582	1,527	$196,163	232	$302,260	36	$85,446	1,795	$583,868
Misenhiemer	169	158	$14,408	11	$5,368	29	$81,098	198	$100,874
New London	703	647	$140,923	80	$224,462	25	$34,135	752	$399,520
Norwood	2,080	1,918	$276,990	206	$233,345	45	$72,544	2,169	$582,879
Oakboro	1,237	1,186	$151,003	205	$275,832	39	$51,426	1,430	$478,261
Red Cross	397	513	$67,489	39	$28,625	15	$60,782	567	$156,896
Richfield	930	877	$116,630	141	$136,922	24	$37,872	1,042	$291,423
Stanfield	891	862	$128,716	125	$228,286	23	$27,501	1,010	$384,502
Unincorporated Area	14,134	19,223	$2,331,477	1,781	$2,145,022	307	$481,467	21,311	$4,957,966
Union County	**33,936**	**82,166**	**$19,679,183**	**5,880**	**$16,466,352**	**1,385**	**$5,249,116**	**89,431**	**$41,394,655**
Fairview	1,248	2,213	$410,349	166	$474,397	63	$190,267	2,442	$1,075,012
Hemby Bridge	631	852	$99,669	62	$84,425	25	$37,207	939	$221,302
Indian Trail	2,038	11,266	$2,085,061	854	$1,983,452	115	$338,552	12,235	$4,407,065
Lake Park	3	1,182	$202,533	14	$66,902	5	$5,483	1,201	$274,918
Marshville	1,491	1,535	$249,141	220	$392,357	43	$203,644	1,798	$845,142
Marvin	143	1,606	$929,903	42	$87,952	10	$53,741	1,658	$1,071,596
Mineral Springs	642	1,377	$248,417	96	$279,359	31	$50,556	1,504	$578,333
Monroe	7,037	11,060	$2,210,419	1,754	$4,658,114	244	$827,667	13,058	$7,696,200
Stallings	2,078	5,120	$1,004,202	365	$832,790	22	$40,191	5,507	$1,877,184
Unionville	1,733	3,134	$628,576	190	$901,184	108	$372,631	3,432	$1,902,391
Waxhaw	676	3,100	$817,478	187	$307,379	35	$106,730	3,322	$1,231,587
Weddington	673	3,520	$1,406,824	107	$221,651	59	$231,842	3,686	$1,860,317
Wesley Chapel	440	2,715	$811,551	36	$113,013	29	$95,872	2,780	$1,020,437
Wingate	536	902	$191,410	41	$47,869	64	$221,194	1,007	$460,474
Unincorporated Area	14,567	32,584	$8,383,650	1,746	$6,015,508	532	$2,473,539	34,862	$16,872,697
Cabarrus Stanly Union Regional Total	**102,855**	**190,863**	**$35,876,831**	**17,017**	**$44,637,499**	**3,711**	**$12,140,985**	**211,591**	**$92,655,315**

Source: NCEM Risk Management Tool

TABLE 6.13: POPULATION VULNERABILITY TO THE EARTHQUAKE HAZARD

Location	Elderly at Risk	Children at Risk	Total at Risk
Cabarrus County	**31,114**	**15,471**	**236,653**
Concord	11,320	6,155	89,596
Harrisburg	1,589	803	15,355
Kannapolis	7,330	3,498	47,956
Midland	234	95	1,929
Mount Pleasant	239	47	1,271
Unincorporated Area	10,402	4,873	80,546
Stanly County	**12,159**	**3,471**	**64,032**
Albemarle	2,485	626	10,832
Badin	58	12	292
Locust	494	145	2,783
Misenhiemer	26	7	140
New London	121	55	743
Norwood	217	60	1,293
Oakboro	175	38	905
Red Cross	148	34	750
Richfield	163	43	889
Stanfield	158	51	1,063
Unincorporated Area	8,114	2,400	44,342
Union County	**30,154**	**13,650**	**241,005**
Fairview	777	167	4,619
Hemby Bridge	402	274	3,573
Indian Trail	3,578	2,174	29,870
Lake Park	265	131	1,934
Marshville	190	45	918
Marvin	488	269	7,536
Mineral Springs	475	198	4,630
Monroe	3,972	1,692	28,795
Stallings	1,635	957	12,458
Unionville	1,133	260	6,921
Waxhaw	1,195	772	13,375
Weddington	1,768	839	16,171
Wesley Chapel	841	456	9,516
Wingate	74	51	622
Unincorporated Area	13,361	5,365	100,067
Cabarrus Stanly Union Regional Total	**73,427**	**32,592**	**541,690**

Source: NCEM Risk Management Tool

SOCIAL VULNERABILITY

It is assumed that all existing populations and future populations are at risk of the earthquake hazard. Timely sheltering/evacuations of elderly and young individuals, disabled individuals, and individuals requiring specialized care or equipment are of critical importance to reducing risk during a severe earthquake event.

CRITICAL FACILITIES

All critical facilities should still be considered at risk to minor damage should an event occur. A list of all individual critical facilities in the region can be found in **Table 6.28**.

In conclusion, an earthquake could potentially impact all existing and future buildings, facilities, and populations in the Cabarrus Stanly Union region. Though minor earthquakes are often recorded but not felt, they may rattle breakables and cause minimal damage. Furthermore, major earthquakes have the potential to damage structures. Severe impacts of earthquakes may result in debris clean-up, service disruption, building collapse, and fatalities. Specific vulnerabilities for assets will be greatly dependent on their individual design and the mitigation measures in place, where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available. Furthermore, mitigation actions to address earthquake vulnerability will be considered.

6.5.4. Geological (Landslide)

GIS analysis was used to complete the vulnerability assessment for landslides in the Cabarrus Stanly Union Region. The potential dollar value of exposed land and property total can be determined using the USGS Landslide Susceptibility Index (detailed in Section 5: *Hazard Profiles*), county level tax parcel data, and GIS analysis. **Table 6.14** presents the potential at-risk property where available. All areas of the Cabarrus Stanly Union Region are identified as moderate or high incidence areas by the USGS landslide data. The incidence levels (high and moderate) were used to identify different areas of concern for the analysis below.

TABLE 6.14: TOTAL POTENTIAL AT-RISK PARCELS FOR THE GEOLOGICAL (LANDSLIDE) HAZARD

Location	Number of Parcels at Risk		Number of Improvements at Risk		Total Value of Improvements at Risk ($)	
Incidence Level	Moderate	High	Moderate	High	Moderate	High
Cabarrus County	**48,515**	**58,426**	**35,048**	**50,918**	**$13,351,973,070**	**$22,137,758,585**
Concord	7,566	34,424	6,699	30,850	$3,941,247,930	$14,563,368,590
Harrisburg	0	8,735	0	7,790	$0	$3,499,666,050
Kannapolis	24,634	353	16,846	281	$6,164,799,860	$134,209,790
Midland	2,962	64	2,277	38	$655,232,050	$15,849,150
Mount Pleasant	3	897	0	777	$0	$287,135,170
Unincorporated Area	13,350	13,953	9,226	11,182	$2,590,693,230	$3,637,529,835
Stanly County	**11,737**	**30,856**	**8,383**	**22,106**	**$1,841,783,407**	**$3,122,527,030**
Albemarle	0	9,387	0	7,424	$0	$1,268,521,614
Badin	914	1	692	1	$54,916,417	$535,273
Locust	2,178	977	1,540	810	$353,921,568	$155,069,795
Misenhiemer	158	0	112	0	$97,211,165	$0
New London	15	394	14	302	$9,782,860	$65,298,603
Norwood	0	2,389	0	1,568	$0	$194,847,913
Oakboro	1,246	249	972	213	$182,856,682	$41,267,143
Red Cross	22	484	18	363	$1,539,989	$57,556,435
Richfield	512	0	343	0	$78,953,289	$0
Stanfield	864	0	702	0	$133,589,693	$0
Unincorporated Area	5,828	16,975	3,990	11,425	$929,011,744	$1,339,430,254
Union County	**111,043**	**0**	**90,233**	**0**	**$27,022,430,900**	**$0**

Location	Number of Parcels at Risk		Number of Improvements at Risk		Total Value of Improvements at Risk ($)	
Incidence Level	Moderate	High	Moderate	High	Moderate	High
Fairview	2,080	0	1,547	0	$428,910,900	$0
Hemby Bridge	854	0	654	0	$117,578,800	$0
Indian Trail	17,073	0	14,749	0	$4,062,315,600	$0
Lake Park	1,409	0	1,273	0	$292,255,100	$0
Marshville	1,218	0	973	0	$148,411,900	$0
Marvin	2,308	0	2,036	0	$1,179,220,800	$0
Mineral Springs	1,570	0	1,244	0	$309,587,600	$0
Monroe	15,742	0	12,553	0	$3,319,374,000	$0
Stallings	7,571	0	6,546	0	$1,788,732,900	$0
Unionville	3,051	0	2,343	0	$560,701,000	$0
Waxhaw	8,196	0	7,447	0	$2,386,168,300	$0
Weddington	4,814	0	4,196	0	$2,295,642,800	$0
Wesley Chapel	3,012	0	2,709	0	$957,152,600	$0
Wingate	1,174	0	838	0	$208,399,400	$0
Unincorporated Area	40,971	0	31,125	0	$8,967,979,200	$0
Cabarrus Stanly Union Regional Total	**171,295**	**89,282**	**133,664**	**73,024**	**$42,216,187,377**	**$25,260,285,615**

Source: United States Geological Survey, Local governments

SOCIAL VULNERABILITY

Landslides are often geographically confined to a small area and do not have wide-ranging impacts on large segments of the population. Additionally, social vulnerability does not intersect as much with landslide hazards as it does with other, more wide-ranging hazards.

CRITICAL FACILITIES

There are approximately 247 critical facilities located in a high susceptibility area between Cabarrus County and Stanly County, including the following: 2 emergency operations centers, 47 fire/EMS stations, 15 police stations, 70 schools, and 113 medical care facilities among others. The remaining critical facilities are located in moderate to low incidence areas. A list of specific critical facilities and their associated risk can be found in **Table 6.28** at the end of this section.

In conclusion, a landslide has the potential to impact many existing and future buildings, facilities, and populations in the Cabarrus Stanly Union Region, though some areas are at a higher risk than others due to a variety of factors. For example, steep slopes and modified slopes bear a greater risk than flat areas. Specific vulnerabilities for Cabarrus Stanly Union assets will be greatly dependent on their individual design and the mitigation measures in place, where appropriate. Such site-specific vulnerability determinations are outside the scope of this assessment but will be considered during future plan updates if data becomes available.

6.5.5 Flooding

Historical evidence indicates that the Cabarrus Stanly Union Region is susceptible to flood events. A total of 243 flood events have been reported by the National Centers for Environmental Information since 1993, resulting in over $24.1 million dollars in damages and nine fatalities.

In order to assess flood risk, a GIS-based analysis was used to estimate exposure to flood events using

Digital Flood Insurance Rate Map (DFIRM) data in combination with local tax assessor records for each of the Cabarrus Stanly Union counties. The determination of assessed value at-risk (exposure) was calculated using GIS analysis by summing the total assessed building values for only those improved properties that were confirmed to be located within an identified floodplain. **Table 6.15** presents the potential at-risk property. Both the number of parcels and the approximate value of improvements are presented. Building-specific risk and mitigation information can be obtained through the North Carolina Flood Risk Information System (FRIS) and North Carolina Floodplain Mapping Program (NCFMP).

TABLE 6.15: ESTIMATED EXPOSURE OF PARCELS TO THE FLOODING HAZARD

	1.0-percent (100-year) ACF			0.2-percent (500-year) ACF		
Location	**Approx. Number of Parcels**	**Approx. Number of Improved Buildings**	**Approx. Improved Value of Buildings**	**Approx. Number of Parcels**	**Approx. Number of Improved Buildings**	**Approx. Improved Value of Buildings**
Cabarrus County	**7,135**	**4,843**	**$5,228,552,960**	**6,943**	**5,148**	**$5,233,630,160**
Concord	2,203	1,639	$3,430,295,050	2,514	1,977	$3,396,852,990
Harrisburg	787	608	$392,658,750	939	769	$464,033,050
Kannapolis	1,284	770	$683,397,320	1,126	798	$733,221,010
Midland	283	186	$75,795,950	304	209	$66,775,750
Mount Pleasant	38	27	$12,354,560	37	32	$11,666,300
Unincorporated Area	2,540	1,613	$634,051,330	2,023	1,363	$561,081,060
Stanly County	**3,051**	**1,861**	**$383,420,768**	**868**	**495**	**$99,665,104**
Albemarle	591	362	$95,073,939	424	262	$62,203,306
Badin	21	6	$859,996	15	6	$859,996
Locust	0	0	$0	0	0	$0
Misenhiemer	23	18	$37,746,102	0	0	$0
New London	2	1	$1,237	0	0	$0
Norwood	103	70	$17,375,970	31	22	$3,271,461
Oakboro	9	7	$2,325,799	0	0	$0
Red Cross	11	5	$1,274,003	0	0	$0
Richfield	28	17	$26,078,620	0	0	$0
Stanfield	58	32	$8,740,416	0	0	$0
Unincorporated Area	2,263	1,375	$202,685,102	398	205	$33,330,341
Union County	**8,735**	**5,852**	**$2,181,249,300**	**3,710**	**2,652**	**$1,154,144,100**
Fairview	373	254	$70,230,700	197	137	$35,081,100
Hemby Bridge	62	46	$6,658,800	66	49	$7,135,800
Indian Trail	1,086	808	$285,952,700	617	471	$187,611,600
Lake Park	4	2	$6,175,500	2	0	$0
Marshville	55	41	$17,267,800	6	4	$3,895,900
Marvin	162	122	$75,097,500	129	97	$63,108,700
Mineral Springs	137	91	$25,583,400	10	7	$1,768,500
Monroe	817	566	$218,771,500	647	438	$155,376,900
Stallings	236	186	$68,031,600	111	85	$20,940,700
Unionville	361	246	$60,550,500	114	83	$21,708,100
Waxhaw	326	232	$96,965,500	303	233	$104,615,400
Weddington	292	227	$131,374,600	168	132	$81,841,700
Wesley Chapel	256	185	$59,831,400	230	173	$58,075,600
Wingate	77	60	$16,388,800	34	26	$9,741,300

Location	1.0-percent (100-year) ACF			0.2-percent (500-year) ACF		
	Approx. Number of Parcels	Approx. Number of Improved Buildings	Approx. Improved Value of Buildings	Approx. Number of Parcels	Approx. Number of Improved Buildings	Approx. Improved Value of Buildings
Unincorporated Area	4,491	2,786	$1,042,369,000	1,076	717	$403,242,800
Cabarrus Stanly Union Regional Total	**18,921**	**12,556**	**$7,793,223,028**	**11,521**	**8,295**	**$6,487,439,364**

Source: FEMA DFIRM

To assess flood risk, the NCEM RMT analyzed buildings located in the 1-percent annual chance area, or 100-year return period, of floodplains. The buildings are assessed by the type of building (commercial, residential, or public) and also assessed by status as pre-FIRM buildings, or structures built before flood ordinance regulations were implemented. This data is broken down by jurisdiction in **Table 6.16**.

TABLE 6.16: BUILDING VULNERABILITY FOR THE 100-YEAR FLOODPLAINS

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**250**	**549**	**$4,625,432**	**31**	**$770,059**	**7**	**$236,583**	**587**	**$5,632,074**
Concord	49	168	$1,345,560	16	$353,063	3	$31,055	187	$1,729,678
Harrisburg	56	72	$1,376,833	4	$95,160	0	$0	76	$1,471,994
Kannapolis	109	132	$517,938	3	$279,170	2	$185,651	137	$982,758
Midland	6	10	$137,883	0	$0	0	$0	10	$137,883
Mount Pleasant	1	1	$672	0	$0	0	$0	1	$672
Unincorporated Area	29	166	$1,246,546	8	$42,666	2	$19,877	176	$1,309,089
Stanly County	**134**	**100**	**$1,605,826**	**47**	**$1,637,194**	**0**	**$0**	**147**	**$3,243,020**
Albemarle	96	53	$1,406,673	46	$1,610,391	0	$0	99	$3,017,064
Badin	0	0	$0	0	$0	0	$0	0	$0
Locust	0	1	$2,064	0	$0	0	$0	1	$2,064
Misenhiemer	2	2	$1,970	0	$0	0	$0	2	$1,970
New London	0	0	$0	0	$0	0	$0	0	$0
Norwood	12	12	$18,792	0	$0	0	$0	12	$18,792
Oakboro	1	1	$1,000	0	$0	0	$0	1	$1,000
Red Cross	0	0	$0	0	$0	0	$0	0	$0
Richfield	1	1	$406	0	$0	0	$0	1	$406
Stanfield	0	0	$0	0	$0	0	$0	0	$0
Unincorporated Area	22	30	$174,921	1	$26,803	0	$0	31	$201,724
Union County	**133**	**263**	**$709,172**	**55**	**$2,186,401**	**2**	**$9,129**	**320**	**$2,904,701**
Fairview	1	6	$41,002	1	$566	0	$0	7	$41,568
Hemby Bridge	10	9	$5,729	4	$29,117	0	$0	13	$34,846
Indian Trail	22	114	$205,387	18	$164,445	0	$0	132	$369,832
Lake Park	0	0	$0	0	$0	0	$0	0	$0
Marshville	6	9	$79,810	4	$1,316,472	0	$0	13	$1,396,282
Marvin	0	0	$0	0	$0	0	$0	0	$0
Mineral Springs	0	1	$882	0	$0	0	$0	1	$882
Monroe	33	21	$131,133	19	$487,711	0	$0	40	$618,844
Stallings	2	10	$21,696	0	$0	0	$0	10	$21,696

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Unionville	3	9	$13,401	0	$0	0	$0	9	$13,401
Waxhaw	0	1	$129	0	$0	0	$0	1	$129
Weddington	1	4	$23,131	0	$0	0	$0	4	$23,131
Wesley Chapel	1	3	$18,470	0	$0	0	$0	3	$18,470
Wingate	5	13	$38,207	0	$0	0	$0	13	$38,207
Unincorporated Area	49	63	$130,195	9	$188,090	2	$9,129	74	$327,413
Cabarrus Stanly Union Regional Total	**517**	**912**	**$6,940,430**	**133**	**$4,593,654**	**9**	**$245,712**	**1054**	**$11,779,795**

Source: NCEM Risk Management Tool

Figure 6.4 below displays visual hotspots of potential dollar losses for the flood hazard in Cabarrus County. The same information for Stanly County and Union County is presented below in **Figures 6.5 and 6.6.**

FIGURE 6.4: POTENTIAL DOLLAR LOSSES FOR FLOODING IN CABARRUS COUNTY

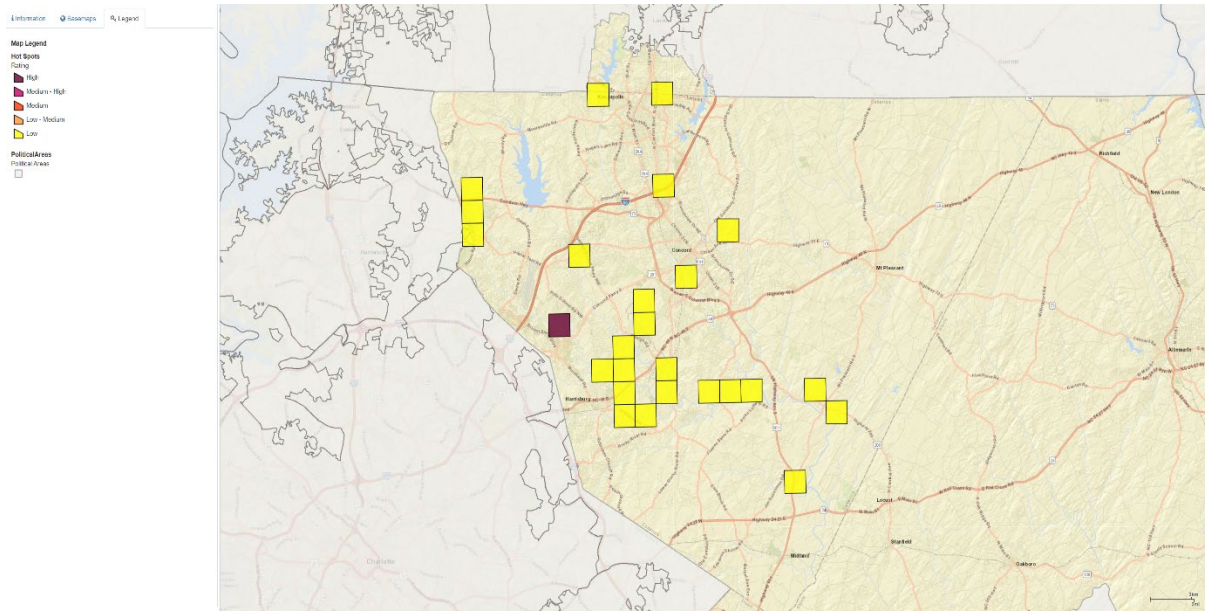
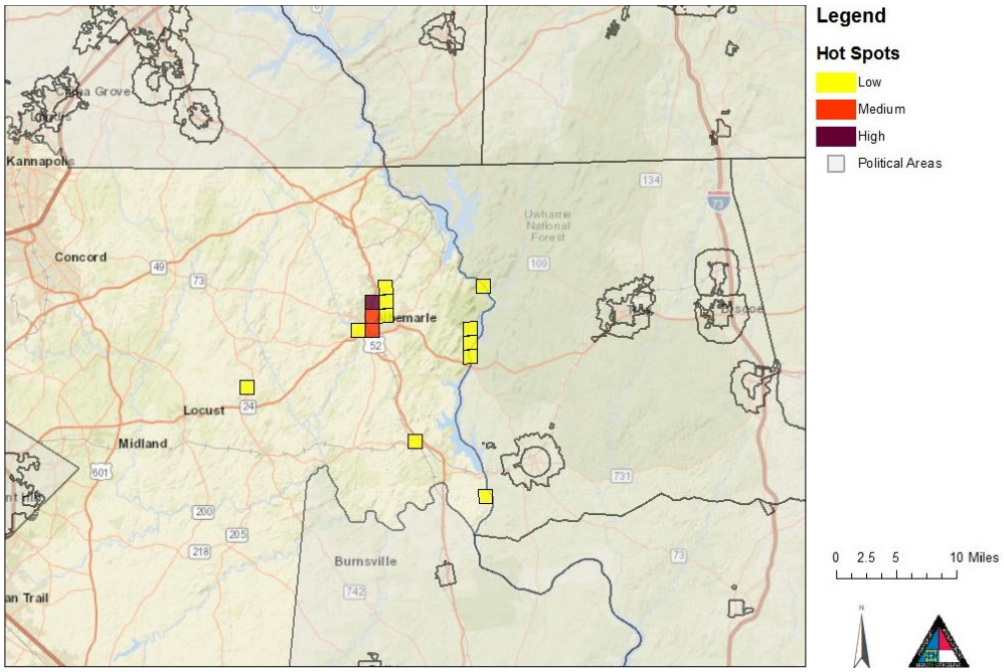
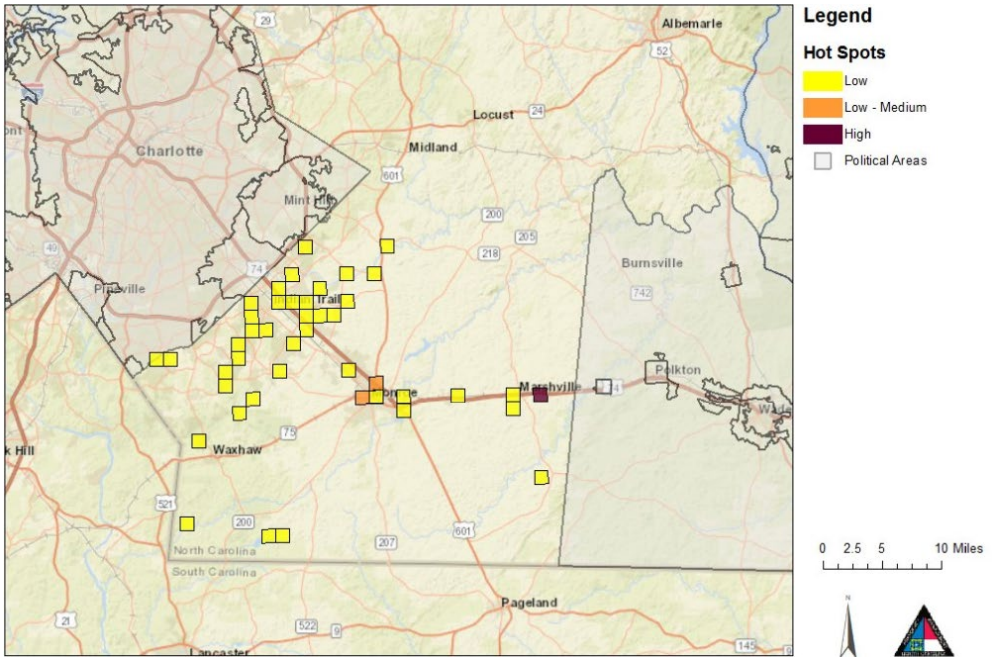


FIGURE 6.5: POTENTIAL DOLLAR LOSSES FOR FLOODING IN STANLY COUNTY



Source: NCEM Risk Management Tool

FIGURE 6.6: POTENTIAL DOLLAR LOSSES FOR FLOODING IN UNION COUNTY



Source: NCEM Risk Management Tool

Table 6.17 assesses the vulnerability of the region's population. This data is also from the RMT and analyzes the populations of elderly and children living at risk of the flooding hazard in the 1-percent annual chance floodplain area.

TABLE 6.17: POPULATION VULNERABILITY FOR 100-YEAR FLOODPLAINS

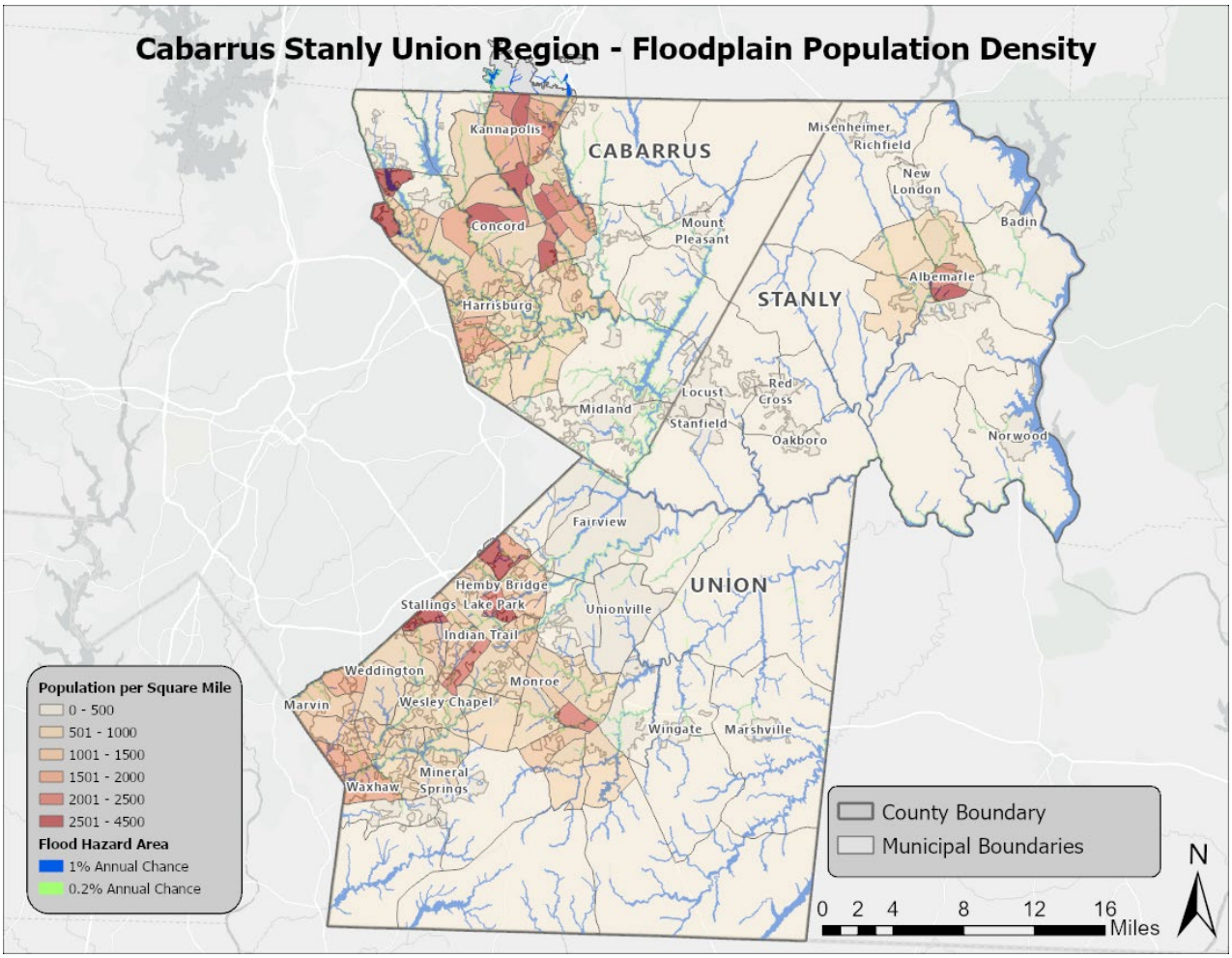
Location	Elderly at Risk	Children at Risk	Total at Risk
Cabarrus County	**234**	**118**	**1,837**
Concord	76	42	605
Harrisburg	34	17	333
Kannapolis	52	25	338
Midland	1	1	12
Mount Pleasant	0	0	1
Unincorporated Area	71	33	548
Stanly County	**34**	**9**	**170**
Albemarle	20	5	87
Badin	0	0	0
Locust	0	0	2
Misenhiemer	0	0	2
New London	0	0	0
Norwood	1	0	8
Oakboro	0	0	1
Red Cross	0	0	0
Richfield	0	0	1
Stanfield	0	0	0
Unincorporated Area	13	4	69
Union County	**87**	**44**	**694**
Fairview	2	0	13
Hemby Bridge	4	3	38
Indian Trail	36	22	302
Lake Park	0	0	0
Marshville	1	0	5
Marvin	0	0	0
Mineral Springs	0	0	3
Monroe	8	3	54
Stallings	3	2	24
Unionville	3	1	20
Waxhaw	0	0	4
Weddington	2	1	18
Wesley Chapel	1	1	11
Wingate	1	1	9
Unincorporated Area	26	10	193
Cabarrus Stanly Union Regional Total	**355**	**171**	**2,701**

Source: NCEM Risk Management Tool

SOCIAL VULNERABILITY

A national Census was last conducted in 2020 and may offer more accurate insights compared to the current availability of population estimates. This data was analyzed to further understand at-risk populations to the flooding hazard in the Cabarrus Stanly Union Region and specific floodplain areas of concern can be seen below in **Figure 6.7**.

FIGURE 6.7: POPULATION DENSITY NEAR FLOODPLAINS



Source: FEMA DFIRM, US Census Bureau

CRITICAL FACILITIES

The critical facility analysis revealed that there are only five critical facilities located in the Cabarrus Stanly Union Region's 1.0-percent and 0.2-percent annual chance floodplain based on FEMA DFIRM boundaries and GIS analysis. As previously noted, this analysis does not consider building elevation, which may negate risk. These facilities are a fire station in Cabarrus County, three medical care facilities in Cabarrus County, and one medical care facility in Union County. There are no critical facilities in a floodplain in Stanly County. A list of specific critical facilities and their associated risk can be found in **Table 6.28** at the end of this section.

In conclusion, a flood has the potential to impact many existing and future buildings, facilities, and populations in the Cabarrus Stanly Union Region, though some areas are at a higher risk than others. All types of structures in a floodplain are at-risk, though elevated structures will have a reduced risk. As noted, the floodplains used in this analysis include the 100-year and 500-year FEMA regulated floodplain boundaries. It is certainly possible that more severe events could occur beyond these boundaries or urban (flash) flooding could impact additional structures. Such site-specific vulnerability determinations should be considered during future plan updates. Furthermore, areas subject to repetitive flooding

should be analyzed for potential mitigation actions. **Table 6.18** below lists repetitive loss properties and their associated number of losses for each county.

TABLE 6.18: SUMMARY OF REPETITIVE LOSS PROPERTIES

Location	Number of Properties	Number of Losses
Cabarrus County	**26**	**93**
Concord	3	8
Harrisburg	7	31
Kannapolis	3	7
Midland	0	0
Mount Pleasant	0	0
Unincorporated Area	13	47
Stanly County	**8**	**26**
Albemarle	7	23
Badin	0	0
Locust	0	0
Misenhiemer	0	0
New London	0	0
Norwood	0	0
Oakboro	0	0
Red Cross	0	0
Richfield	0	0
Stanfield	0	0
Unincorporated Area	1	3
Union County	**7**	**21**
Fairview	0	0
Hemby Bridge	0	0
Indian Trail	1	3
Lake Park	0	0
Marshville	0	0
Marvin	0	0
Mineral Springs	0	0
Monroe	1	2
Stallings	1	3
Unionville	1	3
Waxhaw	0	0
Weddington	0	0
Wesley Chapel	1	3
Wingate	0	0
Unincorporated Area	2	7
Cabarrus Stanly Union Regional Total	**41**	**140**

Source: National Flood Insurance Program

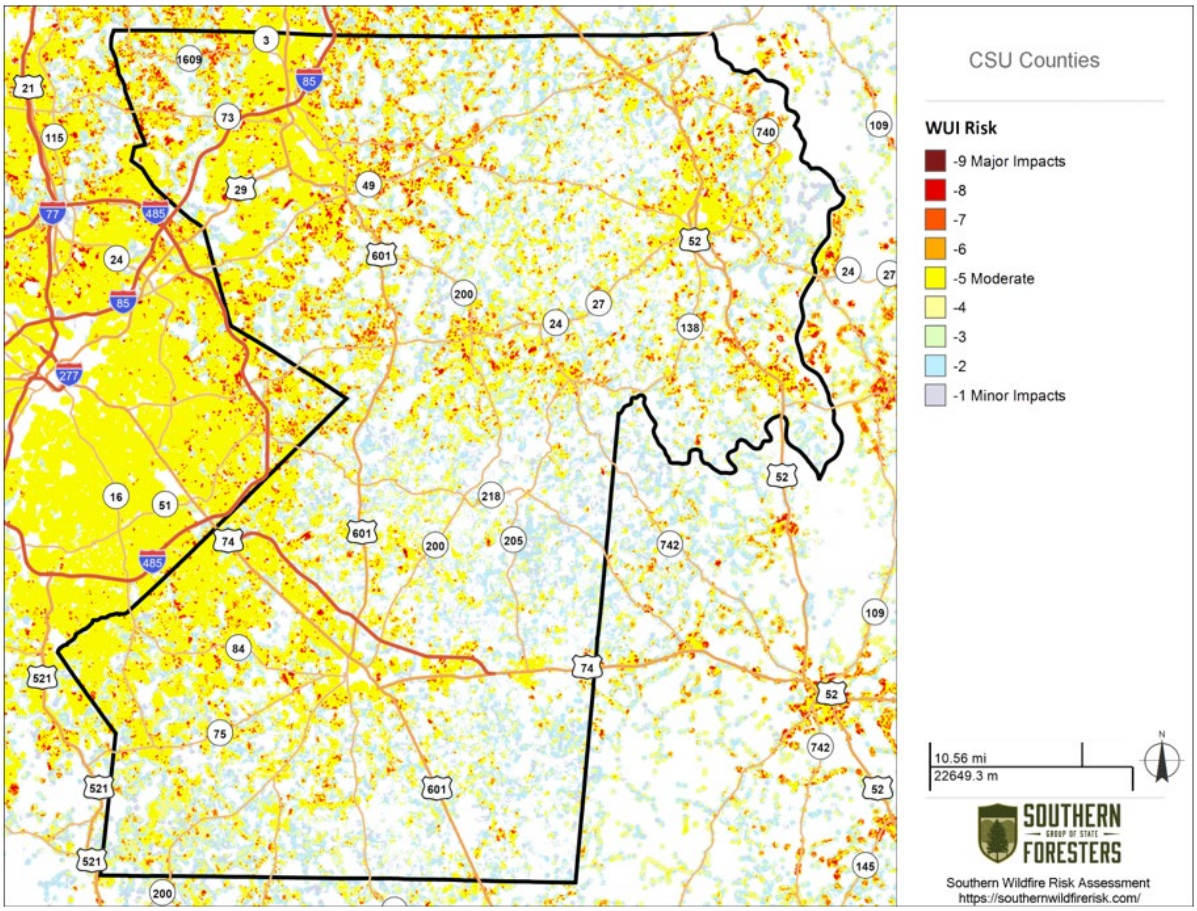
6.5.6 Wildfires

Although historical evidence indicates that the Cabarrus Stanly Union Region is susceptible to wildfire events, there are few reports of damage. Therefore, it is difficult to calculate a reliable annualized loss figure. Annualized loss is considered negligible though it should be noted that a single event could result

in significant damages throughout the region.

To estimate exposure to wildfire, the Wildland Urban Interface (WUI) Risk Index for the region was obtained through the Southern Wildfire Risk Assessment. The WUI uses a Response Function modeling approach and rates the potential impact of a wildfire on people and their homes. The index ranges from -1 to -9, with -9 being the most negative impact. For example, an area with high housing density and high flame lengths are rated -9, while an area with low housing density and low flame lengths are rated -1. At-risk areas fall within the range of -7 to -9. **Figure 6.8** shows the WUI Risk Index for the region below.

FIGURE 6.8: WILDLAND URBAN INTERFACE RISK INDEX



Source: Southern Wildfire Risk Assessment

The region contains some lands where the value falls into the at-risk category, though the region has somewhat less land labeled as at-risk compared to other regions of North Carolina. Overall, there is likely considerably less risk in this region than in other areas of the country. As of 2024 findings from the Southern Wildfire Risk Assessment, burn probabilities of the region range from 1 (lowest probability) to 5 on a scale rated up to 10 (highest probability). Specifically, out of 597,187 total assessed acres, 39% of the region is rated a probability of 1, 37.5% a 2, 19.2% a 3, 3.5% a 4, and 0.8% a 5.

SOCIAL VULNERABILITY

Even though not all areas have equal vulnerability, there is some susceptibility across the entire Cabarrus Stanly Union Region. It is assumed that the total population is at risk to the wildfire hazard. Determining the exact number of people in certain wildfire zones is difficult with existing data and could be misleading. Timely sheltering/evacuations of elderly and young individuals, disabled individuals, and individuals requiring specialized care or equipment are of critical importance to reducing risk during a severe wildfire event.

CRITICAL FACILITIES

Although no county had many critical facilities in the at-risk area (-7 or higher) for wildfires, Union County had the most with 7 facilities. These facilities were three schools and four medical facilities. Cabarrus County had 3 at-risk facilities, and Stanly County only had 2. This data reflects a slightly elevated risk in Union County for critical facilities to wildfires.

Table 6.19 shows the results of the GIS analysis.

TABLE 6.19: CRITICAL FACILITIES IN THE AT-RISK WUI RISK INDEX AREA

Location	Number of At-Risk Critical Facilities
Cabarrus County	3
Stanly County	2
Union County	7
Cabarrus Stanly Union Regional Total	**12**

Source: Southern Wildfire Risk Assessment, Local governments

Additional information was provided through the NCEM Risk Management Tool (RMT). This data describes vulnerability in both built and living environments and can be seen below in **Table 6.20** and **Table 6.21**.

TABLE 6.20: BUILDING VULNERABILITY TO WILDFIRE HAZARDS

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**2,518**	**6,215**	**$898,597,829**	**693**	**$924,950,155**	**140**	**$289,878,265**	**7,048**	**$2,113,426,250**
Concord	31	518	$76,855,980	57	$83,552,232	9	$44,881,589	584	$205,289,802
Harrisburg	451	520	$110,307,517	122	$125,888,986	21	$77,711,140	663	$313,907,643
Kannapolis	498	657	$90,327,032	53	$203,448,863	20	$43,186,961	730	$336,962,856
Midland	250	374	$42,194,682	32	$33,974,879	14	$24,313,375	420	$100,482,936
Mount Pleasant	225	240	$29,791,537	31	$32,288,753	7	$13,087,120	278	$75,167,410
Unincorporated Area	1,063	3,906	$549,121,081	398	$445,796,442	69	$86,698,080	4,373	$1,081,615,603
Stanly County	**8,702**	**10,839**	**$1,274,472,234**	**1181**	**$765,971,600**	**231**	**$286,453,591**	**12,251**	**$2,326,897,428**
Albemarle	192	194	$19,264,506	35	$36,150,591	18	$19,361,475	247	$74,776,573
Badin	26	18	$4,670,161	2	$1,804,104	4	$52,935,121	24	$59,409,387
Locust	330	315	$37,599,080	63	$42,680,210	11	$14,401,159	389	$94,680,449
Misenhiemer	6	9	$856,422	0	$0	0	$0	9	$856,422
New London	131	116	$11,422,579	19	$50,834,010	1	$933,660	136	$63,190,249
Norwood	294	274	$32,504,897	25	$39,576,501	12	$10,939,253	311	$83,020,651
Oakboro	465	501	$57,150,847	59	$49,621,475	5	$7,697,126	565	$114,469,448

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Red Cross	148	207	$23,075,438	14	$4,360,974	9	$15,242,577	230	$42,678,990
Richfield	133	134	$36,512,497	14	$4,203,170	5	$2,495,809	153	$43,211,476
Stanfield	545	557	$66,659,044	68	$60,132,862	9	$4,313,895	634	$131,105,801
Unincorporated Area	6,432	8,514	$984,756,763	882	$476,607,703	157	$158,133,516	9,553	$1,619,497,982
Union County	**14,275**	**34,280**	**$5,608,017,289**	**2232**	**$2,104,337,629**	**583**	**$860,984,611**	**37,095**	**$8,573,339,525**
Fairview	590	825	$119,648,563	90	$99,012,681	23	$24,958,387	938	$243,619,630
Hemby Bridge	264	419	$38,592,247	46	$23,644,267	20	$7,586,379	485	$69,822,893
Indian Trail	1,049	6,544	$903,156,032	491	$366,304,463	71	$81,709,994	7,106	$1,351,170,489
Lake Park	3	227	$33,977,644	6	$10,296,830	0	$0	233	$44,274,474
Marshville	715	803	$95,893,273	59	$48,916,014	21	$46,726,435	883	$191,535,721
Marvin	44	471	$224,595,095	10	$6,881,206	4	$13,925,680	485	$245,401,981
Mineral Springs	251	402	$46,491,199	21	$6,037,573	18	$9,408,374	441	$61,937,146
Monroe	573	1,814	$225,772,357	128	$92,266,357	18	$13,168,962	1,960	$331,207,675
Stallings	897	2,317	$376,021,556	182	$125,856,205	14	$8,270,393	2,513	$510,148,154
Unionville	1,334	2,220	$358,230,869	165	$239,020,176	59	$82,979,294	2,444	$680,230,339
Waxhaw	207	282	$31,602,136	53	$26,258,144	11	$15,741,288	346	$73,601,568
Weddington	199	1,086	$300,827,038	56	$36,066,642	14	$12,797,855	1,156	$349,691,535
Wesley Chapel	220	1,415	$314,837,273	26	$27,618,190	17	$24,703,176	1,458	$367,158,639
Wingate	108	280	$38,240,704	15	$7,086,273	5	$10,249,184	300	$55,576,160
Unincorporated Area	7,821	15,175	$2,500,131,303	884	$989,072,608	288	$508,759,210	16,347	$3,997,963,121
Cabarrus Stanly Union Regional Total	**25,495**	**51,334**	**$7,781,087,352**	**4106**	**$3,795,259,384**	**954**	**$1,437,316,467**	**56,394**	**$13,013,663,203**

Source: NCEM Risk Management Tool

TABLE 6.21: POPULATION VULNERABILITY TO WILDFIRE HAZARDS

Location	Elderly at Risk	Children at Risk	Total at Risk
Cabarrus County	**2,494**	**1,184**	**19,460**
Concord	236	128	1,870
Harrisburg	245	124	2,372
Kannapolis	256	122	1,677
Midland	54	22	444
Mount Pleasant	37	7	195
Unincorporated Area	1,666	781	12,902
Stanly County	**4,091**	**1,201**	**22,396**
Albemarle	77	19	334
Badin	2	0	9
Locust	102	30	574
Misenhiemer	1	0	8
New London	22	10	133
Norwood	31	9	185
Oakboro	74	16	382
Red Cross	60	14	303

Location	Elderly at Risk	Children at Risk	Total at Risk
Richfield	25	7	136
Stanfield	102	33	687
Unincorporated Area	3,595	1,063	19,645
Union County	**12,525**	**5,621**	**98,435**
Fairview	290	62	1,722
Hemby Bridge	198	135	1,757
Indian Trail	2,078	1,263	17,350
Lake Park	51	25	374
Marshville	100	24	481
Marvin	143	79	2,210
Mineral Springs	139	58	1,352
Monroe	650	277	4,714
Stallings	740	433	5,637
Unionville	798	183	4,874
Waxhaw	109	70	1,216
Weddington	545	259	4,988
Wesley Chapel	438	238	4,960
Wingate	23	16	192
Unincorporated Area	6,223	2,499	46,608
Cabarrus Stanly Union Regional Total	**19,110**	**8,006**	**140,291**

Source: NCEM Risk Management Tool

6.5.7 Hazardous Substances

Although historical evidence and existing Toxic Release Inventory (TRI) sites indicate that the Cabarrus Stanly Union Region is susceptible to hazardous substance events, there are few reports of damage. Therefore, a calculated annualized loss figure may not be completely reliable.

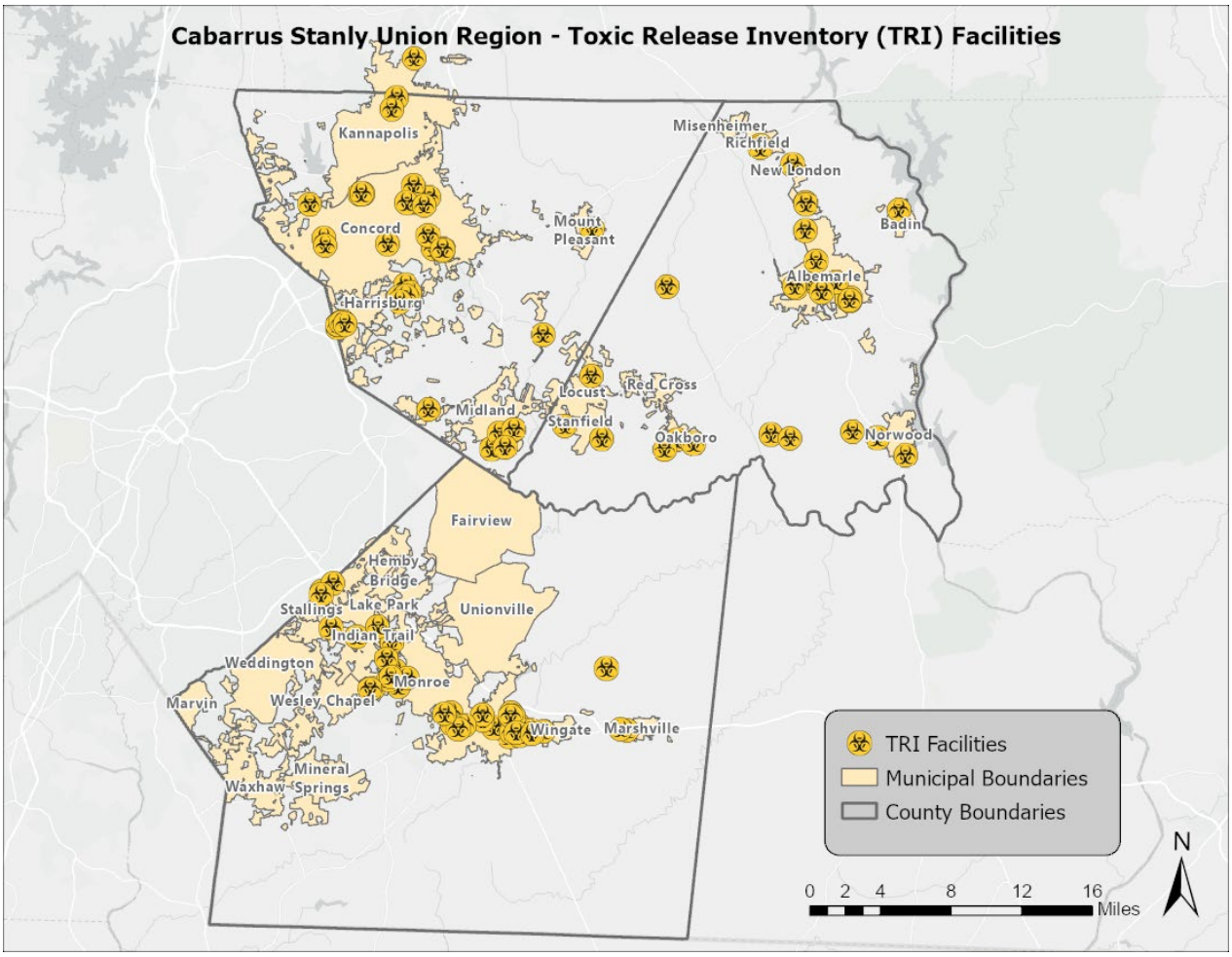
Most hazardous substance incidents that occur are contained and suppressed before destroying any property or threatening lives. However, they can have a significant negative impact. Such events can cause multiple deaths, completely shut down facilities for 30 days or more, and cause more than 50 percent of affected properties to be destroyed or suffer major damage. In a hazardous substance incident, solid, liquid, and/or gaseous contaminants may be released from fixed or mobile containers. Weather conditions will directly affect how the hazard develops. Certain chemicals may travel through the air or water, affecting a much larger area than the point of the incidence itself. Non-compliance with fire and building codes, as well as failure to maintain existing fire and containment features, can substantially increase the damage from a hazardous materials release. The duration of a hazardous materials incident can range from hours to days. Warning time is minimal to none.

In order to conduct the vulnerability assessment for this hazard, GIS intersection analysis was used for fixed and mobile areas and parcels[11]. In both scenarios, two sizes of buffers—0.5 mile and 1 mile—were used. These areas are assumed to respect the different levels of effect: immediate (primary) and secondary. Primary and secondary impact sites were selected based on guidance from FEMA 426, Reference Manual to Mitigate Potential Terrorist Attacks against Buildings and engineering judgment.

[11] This type of analysis will likely yield inflated results (generally higher than what is actually reported after an actual event).

For the fixed site analysis, geo-referenced TRI listed toxic sites[12] in the Cabarrus Stanly Union Region, along with buffers, were used for analysis as shown in **Figure 6.9.** For the mobile analysis, the major roads (Interstate highway, U.S. highway, and State highway) and railroads, where hazardous materials are primarily transported that could adversely impact people and buildings, were used for the GIS buffer analysis. **Figure 6.10** shows the areas used for mobile toxic release buffer analysis. The results indicate the approximate number of parcels, improved value, as shown in **Table 6.22** (fixed sites), **Table 6.23** (mobile road sites) and **Table 6.24** (mobile railroad sites)[13].

FIGURE 6.9: TOXIC RELEASE INVENTORY (TRI) FACILITIES



Source: EPA

[12] Note that the TRI coordinates/addresses of some jurisdictional facilities (e.g., Mount Pleasant) may be outdated and recent changes in location may not be corrected in the latest EPA data release. This note applies to all other georeferenced planning datasets used within this plan update.

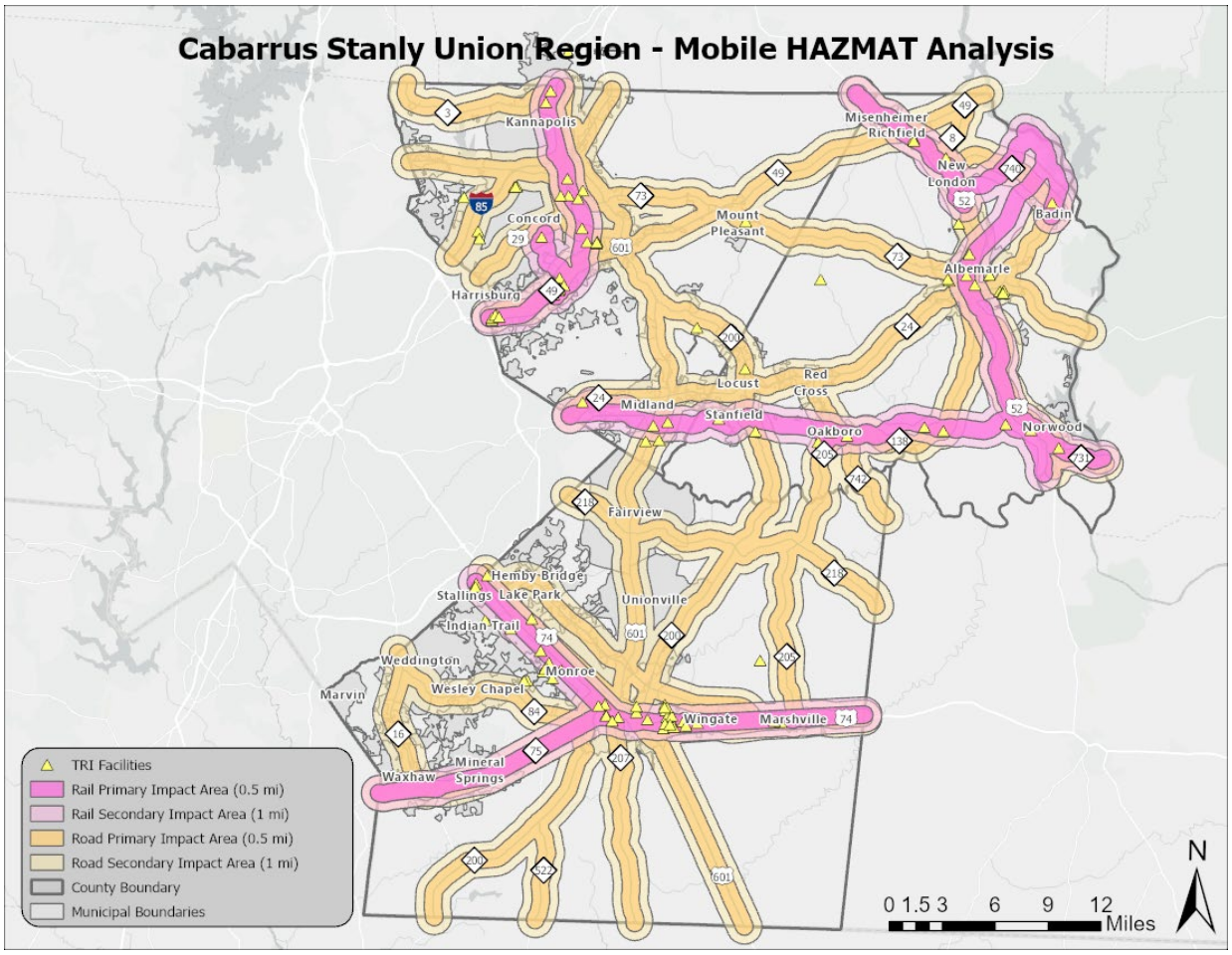
[13] Note that parcels included in the 1-mile analysis are also included in the 0.5-mile analysis.

TABLE 6.22: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS SUBSTANCES (FIXED SITES) IN THE CABARRUS STANLY UNION REGION

Location	0.5 Mile Buffer			1.0 Mile Buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Cabarrus County	**10,165**	**8,345**	**$3,870,037,150**	**30,307**	**24,006**	**$9,821,835,410**
Concord	6,117	5,398	$2,468,277,930	17,178	14,851	$6,739,282,510
Harrisburg	440	389	$272,137,680	1,866	1,715	$732,243,720
Kannapolis	2,174	1,489	$681,832,340	7,309	4,336	$1,355,053,610
Midland	564	406	$118,910,310	1,159	911	$251,873,610
Mount Pleasant	238	206	$43,233,900	661	574	$155,220,780
Unincorporated Area	632	457	$285,644,990	2,134	1619	$588,161,180
Stanly County	**6,710**	**5,176**	**$1,293,817,447**	**16,839**	**12,895**	**$2,440,527,171**
Albemarle	3,873	3,192	$536,169,722	7,709	6,254	$1,031,945,422
Badin	165	107	$12,472,465	787	604	$49,040,186
Locust	179	147	$25,762,111	1,134	979	$176,757,551
Misenhiemer	0	0	$0	0	0	$0
New London	204	158	$45,662,449	394	303	$66,901,225
Norwood	307	209	$28,727,496	1,271	990	$97,759,862
Oakboro	612	469	$104,409,873	1,128	876	$168,457,427
Red Cross	0	0	$0	0	0	$0
Richfield	197	135	$25,144,009	426	288	$47,527,165
Stanfield	113	87	$17,055,946	398	311	$62,595,297
Unincorporated Area	1,060	672	$498,413,376	3,592	2,290	$739,543,036
Union County	**7,359**	**5,565**	**$1,748,819,500**	**21,375**	**17,526**	**$4,501,282,100**
Fairview	0	0	$0	0	0	$0
Hemby Bridge	0	0	$0	0	0	$0
Indian Trail	1,784	1,519	$506,977,100	6,789	6,019	$1,563,794,700
Lake Park	0	0	$0	124	114	$36,198,300
Marshville	325	220	$31,941,700	704	543	$83,156,500
Marvin	0	0	$0	0	0	$0
Mineral Springs	0	0	$0	0	0	$0
Monroe	3,784	3,015	$935,009,400	8,036	6,428	$1,762,469,000
Stallings	879	477	$144,109,500	2,538	1,867	$446,940,100
Unionville	0	0	$0	0	0	$0
Waxhaw	0	0	$0	0	0	$0
Weddington	0	0	$0	0	0	$0
Wesley Chapel	63	56	$7,935,200	255	218	$33,283,300
Wingate	138	39	$6,286,700	545	403	$89,250,100
Unincorporated Area	386	239	$116,559,900	2,384	1,934	$486,190,100
Cabarrus Stanly Union Regional Total	**24,234**	**19,086**	**$6,912,674,097**	**68,521**	**54,427**	**$16,763,644,681**

Source: EPA, Local governments

FIGURE 6.10: MOBILE HAZMAT BUFFERS IN THE CABARRUS STANLY UNION REGION



Source: NC Department of Transportation

TABLE 6.23: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS SUBSTANCES (MOBILE ANALYSIS – ROAD)

Location	0.5 Mile Buffer			1.0 Mile Buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Cabarrus County	**40,986**	**33,315**	**$15,509,954,150**	**68,614**	**55,443**	**$23,724,885,480**
Concord	18,353	16,078	$9,067,018,480	29,817	26,290	$13,692,145,960
Harrisburg	2,264	1,907	$840,815,910	4,218	3,743	$1,615,084,050
Kannapolis	10,784	8,202	$3,447,187,890	18,537	13,408	$4,814,146,840
Midland	2,028	1,534	$460,528,460	2,648	2,011	$576,966,870
Mount Pleasant	768	652	$245,975,640	897	777	$287,135,170
Unincorporated Area	6,789	4,942	$1,448,427,770	12,497	9,214	$2,739,406,590
Stanly County	**22,157**	**16,081**	**$2,981,106,922**	**31,075**	**22,577**	**$3,890,714,267**
Albemarle	6,792	5,301	$954,835,887	9,272	7,340	$1,247,618,195

Location	0.5 Mile Buffer			1.0 Mile Buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Badin	761	588	$49,668,704	914	692	$54,916,417
Locust	2,793	2,106	$449,726,807	3,109	2,323	$503,642,005
Misenhiemer	154	109	$96,963,486	158	112	$97,211,165
New London	369	282	$62,632,755	399	307	$67,077,663
Norwood	1,154	888	$75,624,352	1,541	1,163	$116,348,184
Oakboro	1,057	816	$160,941,081	1,410	1,119	$214,123,838
Red Cross	442	333	$53,431,613	506	381	$59,096,424
Richfield	504	338	$78,706,059	512	343	$78,953,289
Stanfield	535	432	$87,467,112	735	593	$115,868,496
Unincorporated Area	7,596	4,888	$911,109,066	12,519	8,204	$1,335,858,591
Union County	**39,114**	**29,624**	**$8,358,834,400**	**64,037**	**50,546**	**$14,356,846,100**
Fairview	941	707	$203,075,500	1,429	1,088	$307,963,700
Hemby Bridge	386	234	$32,046,900	575	403	$58,724,200
Indian Trail	3,138	2,052	$754,398,800	6,855	5,269	$1,531,593,200
Lake Park	372	353	$81,565,600	1,409	1,273	$292,255,100
Marshville	1,172	937	$143,374,000	1,218	973	$148,411,900
Marvin	408	371	$167,694,500	768	711	$339,165,700
Mineral Springs	558	403	$93,219,300	983	748	$165,315,300
Monroe	9,922	7,520	$1,984,194,400	14,258	11,301	$2,908,763,900
Stallings	954	534	$147,375,400	1,964	1,493	$401,785,200
Unionville	1,187	846	$194,704,900	2,245	1,705	$402,125,200
Waxhaw	4,299	3,815	$1,101,059,700	6,696	6,056	$1,862,436,500
Weddington	1,314	1,073	$671,225,900	2,339	1,995	$1,244,231,600
Wesley Chapel	978	865	$316,460,300	1,605	1,410	$495,627,000
Wingate	1,093	761	$21,014,600	1,174	838	$208,399,400
Unincorporated Area	12,392	9,153	$2,447,424,600	20,519	15,283	$3,990,048,200
Cabarrus Stanly Union Regional Total	**102,257**	**79,020**	**$26,849,895,472**	**163,726**	**128,566**	**$41,972,445,847**

Source: NC Department of Transportation, Local Governments

TABLE 6.24: EXPOSURE OF IMPROVED PROPERTY TO HAZARDOUS SUBSTANCES (MOBILE ANALYSIS – RAILROAD)

Location	0.5 Mile Buffer			1.0 Mile Buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Cabarrus County	**17,739**	**14,273**	**$5,443,236,620**	**34,620**	**27,915**	**$10,050,593,910**
Concord	7,963	6,776	$2,731,920,230	15,036	13,092	$5,072,934,430
Harrisburg	2,034	1,752	$873,270,940	4,380	3,925	$1,723,476,180
Kannapolis	5,865	4,471	$1,462,379,110	11,636	8,322	$2,379,945,390
Midland	995	721	$201,020,810	1,758	1,379	$401,497,010
Mount Pleasant	0	0	$0	0	0	$0
Unincorporated Area	882	553	$174,645,530	1,810	1,197	$472,740,900
Stanly County	**11,762**	**8,633**	**$1,854,101,110**	**19,588**	**14,319**	**$2,563,625,885**
Albemarle	2,869	2,369	$464,054,188	6,038	4,805	$769,574,369

Location	0.5 Mile Buffer			1.0 Mile Buffer		
	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value	Approx. Number of Parcels	Approx. Number Improved	Approx. Improved Value
Badin	744	582	$48,817,572	914	692	$54,916,417
Locust	0	0	$0	126	82	$23,610,648
Misenhiemer	140	96	$92,474,079	158	112	$97,211,165
New London	371	283	$62,240,131	399	307	$67,077,663
Norwood	954	733	$72,025,869	1,423	1,085	$105,049,152
Oakboro	917	715	$141,945,465	1,295	1,010	$189,857,377
Red Cross	0	0	$0	2	2	$162,162
Richfield	406	265	$70,669,877	462	307	$74,848,191
Stanfield	590	488	$84,977,175	853	693	$132,154,323
Unincorporated Area	4,771	3,102	$816,896,754	7,918	5,224	$1,049,164,418
Union County	**13,605**	**10,405**	**$2,661,154,400**	**26,386**	**20,573**	**$5,338,879,500**
Fairview	0	0	$0	0	0	$0
Hemby Bridge	0	0	$0	0	0	$0
Indian Trail	1,260	929	$370,428,100	3,731	2,923	$1,017,754,900
Lake Park	0	0	$0	0	0	$0
Marshville	1,126	890	$137,695,900	1,218	973	$148,411,900
Marvin	0	0	$0	0	0	$0
Mineral Springs	563	439	$103,537,700	1,142	876	$194,124,200
Monroe	5,354	4,109	$1,058,371,800	9,435	7,525	$1,959,626,600
Stallings	691	588	$155,647,200	1,984	1,371	$331,968,000
Unionville	0	0	$0	0	0	$0
Waxhaw	2,070	1,791	$433,077,700	3,649	3,247	$853,889,900
Weddington	0	0	$0	0	0	$0
Wesley Chapel	0	0	$0	0	0	$0
Wingate	800	578	$161,586,700	1,109	781	$199,041,300
Unincorporated Area	1,741	1,081	$240,809,300	4,118	2,877	$634,062,700
Cabarrus Stanly Union Regional Total	**43,106**	**33,311**	**$9,958,492,130**	**80,594**	**62,807**	**$17,953,099,295**

Source: NC Department of Transportation, Local Governments

SOCIAL VULNERABILITY

Given high susceptibility across the entire Cabarrus Stanly Union Region, it is assumed that the total population is at risk of hazardous materials incidents. It should be noted that areas of high population density may be at an elevated risk due to a greater burden to quickly evacuate more people.

CRITICAL FACILITIES

Fixed Site Analysis:

The critical facility analysis for fixed TRI sites revealed that there are 252 facilities located in a HAZMAT risk zone. The primary impact zone (0.5-mile buffer) includes 99 facilities throughout the region. Union County has the most facilities in the primary impact zone with 39 facilities, while Cabarrus County only has 22 facilities. Stanly County has 38 facilities in the 0.5-mile zone. The remaining facilities are in the secondary, 1-mile zone. A list of specific critical facilities and their associated risk can be found in **Table 6.28** at the end of this section.

Mobile Analysis:

The critical facility analysis for road and railroad transportation corridors revealed that there are 368 critical facilities located in the primary (0.5-mile) mobile HAZMAT buffer areas for roads and 180 for railroads throughout the region. Although this is a worst-case scenario model, it indicates that most of the critical facilities in the Cabarrus Stanly Union region are vulnerable to a potential mobile HAZMAT incident. Additionally, there are 464 critical facilities located in the secondary (1-mile) buffer area of roads and 297 facilities in the secondary buffer area of railroads, accounting for over 75 percent of the total number of critical facilities in the region. This may be the result of many critical facilities being located near major roadways for ease of access, but it is nonetheless important to recognize what a large percentage of critical facilities in the region are located in the smaller buffer area. A list of specific critical facilities and their associated risk can be found in **Table 6.28** at the end of this section.

In conclusion, a hazardous material incident has the potential to impact many existing and future buildings, critical facilities, and populations in the Cabarrus Stanly Union Region. Those areas in a primary buffer are at the highest risk, though all areas carry some vulnerability due to variations in conditions that could alter the impact area such direction and speed of wind, volume of release, etc.

6.5.8 Dam Failure

Vulnerability to dam failure in the region is essentially limited to the people, property, infrastructure, critical facilities, and the environment of areas immediately downstream of dams, especially high hazard dams. At the time of the 2025 update of this plan, there is limited modeling data available (or available data is protected) to conduct a detailed vulnerability assessment for this hazard. However, the North Carolina Department of Environmental Quality oversees the statewide Dam Safety Program to reduce the overall risk of this hazard and implement Emergency Action Plans (EAP) for future reference. The U.S. Army Corps of Engineers also maintains the National Inventory of Dams (NID) at the federal level.

Additional information related to high hazard dams of the region can be found in **Table 6.25**.

TABLE 6.25: SUMMARY OF HIGH-HAZARD DAM VULNERABILITY

Dam Name	NID ID	EAP	Condition (as of July 2024)	Owner Type	Max Capacity (acre-feet)	Max Discharge (ft3/s)	River/Stream
CABARRUS COUNTY							
Lake Concord Dam	NC00519	Y	Fair	Local Gov	987	1621	Cold Water Creek
Lake Fisher Dam	NC00520	Y	Fair	Local Gov	6511	18200	Cold Water Creek
Lake Lynn Dam	NC00523	Y	Fair	Private	161	82	Cold Water Creek
Buffalo Ranch Lake Dam	NC00524	N	Fair	Private	68	50	Cold Water Creek
Frank Liske Park Dam	NC06451	Y	Satisfactory	Local Gov	58	7	Wolf Meadow Branch
Oak Cliff Lake Dam	NC00526	Y	Fair	Private	96	90	Dutch Buffalo Creek
Propst Pond Dam	NC01962	Y	Fair	Private	19	N/A	N/A
Christy Nursery Dam	NC05249	Y	Fair	Private	36	230	Coddle Creek

Dam Name	NID ID	EAP	Condition (as of July 2024)	Owner Type	Max Capacity (acre-feet)	Max Discharge (ft3/s)	River/Stream
Furr Dam #1	NC01663	Y	Fair	Private	460	300	Dutch Buffalo Creek
Elmoe Pond Dam	NC01976	N	Fair	Private	13.6	N/A	Coddle Creek
Cabarrus Country Club Lake Dam	NC01977	N	Fair	Private	40	N/A	Wolf Meadow Branch
Black Run Creek Dam	NC01993	Y	Fair	Local Gov	1536	4100	Black Run Creek
Lake Don T. Howell Dam	NC04901	Y	Fair	Local Gov	36400	100000	Coddle Creek
Melvin Harwood Dam	NC04967	N	Fair	Private	41	N/A	Black Run Creek
Lake Daffodil Dam	NC04980	Y	Fair	Private	62	N/A	Irish Buffalo Creek
Faggart Dam	NC05089	Y	Fair	Private	4.2	N/A	Cold Water Creek
Wilkinson Dam	NC05471	Y	Fair	Private	13.52	N/A	Coddle Creek
Christenbury Corners SWM Pond Dam	NC05876	Y	Fair	Private	18	0	Clarke Creek
Sycamore Ridge Dam	NC06025	N	Fair	Private	8	0	UT to Cold Water Creek
Beechwood Place Dam	NC06255	N	Fair	Private	N/A	N/A	N/A
Hunton Forest Dam	NC06277	N	Fair	Private	N/A	N/A	UT to Irish Buffalo Creek
Horton (BMP-3) Dam	NC06281	N	Fair	Private	N/A	N/A	Wolf Meadow Branch
Cannon Run Dam #1	NC06507	Y	Fair	Private	10	N/A	UT to Rocky River
Horton (BMP-2) Dam	NC06595	N	Fair	Private	N/A	N/A	UT to Wolf Meadow Branch
Horton (BMP-1) Dam	NC06596	N	Fair	Private	N/A	N/A	UT to Wolf Meadow Branch
Threadgill Dam	NC06714	N	Fair	Private	N/A	N/A	UT to Dutch Buffalo Creek
Barr Road Dam	NC06982	N	N/A	Private	N/A	N/A	Coddle Creek Reservoir
Cannon Pond Dam	NC07331	N	Fair	Private	N/A	N/A	N/A
Baucom's Nursery Dam 2	NC07685	N	N/A	N/A	N/A	N/A	Unknown Tributary
STANLY COUNTY							
Carolina Stalite Dam	NC00543	Y	Satisfactory	Private	396	330	Long Branch
Long Lake Dam	NC00546	Y	Satisfactory	Local Gov	1397	7900	Long Creek
Yadkin Falls Dam	NC00548	Y	N/A	Private	1810	323000	Yadkin River
Narrows Dam	NC00549	Y	N/A	Private	454790	324000	Yadkin River
Tuckertown Dam	NC00550	Y	N/A	Private	51600	419000	Yadkin River
Snyder Pond Dam	NC04144	Y	Fair	Private	37	N/A	Rices Creek

Dam Name	NID ID	EAP	Condition (as of July 2024)	Owner Type	Max Capacity (acre-feet)	Max Discharge (ft3/s)	River/Stream
Hinson Pond Dam	NC04149	N	Poor	Private	35	0	Stony Run
Reservoir Lake Dam	NC01631	Y	Fair	Local Gov	32	N/A	N/A
Lowder Pond Dam	NC04164	Y	Poor	Private	13.6	N/A	Town Creek
Brooks Dam	NC04167	Y	Satisfactory	Private	132	0	Long Creek
George Sells Dam	NC04174	Y	Fair	Private	29	N/A	Long Creek
Spring Lake Garden Dam	NC05596	N	Fair	Private	13	0	Town Creek
Deese Road Dam	NC05671	N	Unsatisfactory	Local Gov	61	N/A	UT to Curl Tail Creek
Huneycutt Pig Farm Ag Service Pond Dam	NC06252	Y	Fair	Private	29	N/A	UT to Ramsey Creek
Martin Dam	NC06542	N	Fair	Private	N/A	N/A	N/A
UNION COUNTY							
Aero Plantation Lake Dam 1	NC00511	Y	Fair	Private	154	10	W. Mundy's Run Creek
Aero Plantation Lake Dam 2	NC00512	Y	Fair	Private	462	5852	W. Mundy's Run Creek
Mundorf Lake Dam	NC00518	Y	Fair	Private	52	99	UT to Six Mile Creek
Emerald Lake Golf Course Dam	NC00529	N	Fair	Private	50	158	Paddle Branch
Baker Quarry Lake Dam	NC00531	Y	Poor	Private	442	66	Crooked Creek
Twitty Dam	NC00532	Y	Fair	Local Gov	17000	605	Stewarts Creek
Lake Monroe Dam	NC00535	Y	Fair	Local Gov	2721	7500	Richardson Creek
Lake Lee Dam	NC00536	Y	Fair	Local Gov	2465	25009	Richardson Creek
Brewer Lake Dam	NC00537	N	Fair	Private	67	110	Richardson Creek
Griffin Pond Dam	NC04372	Y	Fair	Private	62	0	Stevens Creek
Providence Glen Dam	NC04380	Y	Fair	Private	26.8	N/A	West Fork Creek
Hilton Pond Dam	NC04391	N	Fair	Private	42	0	Twelvemile Creek
Lake Providence Dam	NC04402	Y	Satisfactory	Private	67	N/A	Twelvemile Creek
Antioch Church Road Dam	NC04407	Y	Satisfactory	Private	1012	2666	Twelvemile Creek
Price Dam	NC04865	N	Fair	Private	14.4	N/A	Price Mill Creek
Walden Pond Dam #3	NC05230	Y	Fair	Unknown	111	0	Tarkill Branch
Olde Sycamore WWTP Lagoon Dam	NC05410	N	Fair	Private	50.8	0	Duck Creek
Baker Quarry Fresh Water Pond Dam	NC05411	Y	Fair	Private	13.5	0	UT to Stewarts Creek
Harold Turner Dam	NC05579	N	Fair	Private	27.6	60.9	Reason Branch

Dam Name	NID ID	EAP	Condition (as of July 2024)	Owner Type	Max Capacity (acre-feet)	Max Discharge (ft3/s)	River/Stream
Waybridge at Weddington Dam	NC05639	N	Fair	Unknown	20	0	UT to Twelvemile Creek
Stonebridge Golf Course Dam	NC05711	N	Fair	Private	18	0	Beaverdam Creek
Woodhall Dam	NC06019	Y	Fair	Private	27	424	UT to Cowhorn Branch
Ladera Dam	NC06120	Y	Fair	Private	3	0	UT to Six-Mile Creek
Willowcroft Dam	NC06133	N	Fair	Private	4	N/A	W. Fork Twelvemile Creek
McGee Dam	NC06140	N	Fair	Private	4	N/A	Mundy's Run
Providence Downs South Pond Dam	NC06157	Y	Fair	Private	31	N/A	Cowhorn Branch
Yadkin River Water Supply Project Dam	NC06473	Y	Satisfactory	Local Gov	0	N/A	UT to Richardson Creek
City of Monroe WWTP Equalization Pond Dam	NC06502	Y	Fair	Private	N/A	N/A	Richardson Creek
Village of Wesley Chapel Dam	NC06587	Y	Fair	Private	N/A	N/A	UT to W. Fork Twelvemile Creek
McCoy Farm Pond	NC07051	N	Fair	Private	N/A	N/A	N/A
Fallbrook Dam #2	NC07075	N	N/A	Private	N/A	N/A	UT to Yadkin-Pee Dee River
Fallbrook Dam #1	NC07076	N	N/A	Private	N/A	N/A	UT to Yadkin-Pee Dee River
Fallbrook Dam #3	NC07077	N	N/A	Private	N/A	N/A	UT to Yadkin-Pee Dee River
Daniel Yen Pond Dam	NC07190	N	Fair	Private	N/A	N/A	N/A
Victory Dam #1	NC07450	N	Fair	Private	N/A	N/A	N/A
Unionville-Indian Trail Road Dam	NC07627	N	N/A	Private	N/A	N/A	N/A
W Franklin Street Dam	NC07628	N	N/A	Private	N/A	N/A	N/A
Stallings Farms Dam	NC07648	N	N/A	Private	N/A	N/A	N/A

Source: NCDEQ, July 2024

6.6 CONCLUSIONS ON HAZARD VULNERABILITY

The results of this vulnerability assessment are useful in at least three ways:

- Improving our understanding of the risk associated with the natural hazards in the Cabarrus Stanly Union region through better understanding of the complexities and dynamics of risk, how levels of risk can be measured and compared, and the myriad of factors that influence risk. An understanding of these relationships is critical in making balanced and informed decisions on managing the risk.
- Providing a baseline for policy development and comparison of mitigation alternatives. The data used for this analysis presents a current picture of risk in the Cabarrus Stanly Union Region. Updating this risk "snapshot" with future data will enable comparison of the changes in risk with time. Baselines of this type can support the objective analysis of policy and program options for risk reduction in the region.
- Comparing the risk among the natural hazards addressed. The ability to quantify the risk to all these hazards relative to one another helps in a balanced, multi-hazard approach to risk management at each level of governing authority. This ranking provides a systematic framework to compare and prioritize the very disparate natural hazards that are present in the Cabarrus Stanly Union Region. This final step in the risk assessment provides the necessary information for local officials to craft a mitigation strategy to focus resources on only those hazards that pose the most threat to Cabarrus, Stanly, and Union counties.

Exposure to hazards can be an indicator of vulnerability. Economic exposure can be identified through locally assessed values for improvements (buildings), and social exposure can be identified by estimating the population exposed to each hazard. This information is especially important for decision-makers to use in planning for evacuation or other public safety related needs.

The types of assets included in these analyses include all building types in the participating jurisdictions. Specific information about the types of assets that are vulnerable to the identified hazards is included in each hazard subsection (for example, all building types are considered at risk to the tornadoes/thunderstorms hazard and commercial, residential, and government-owned facilities are at risk of repetitive flooding).

Table 6.26 presents a summary of estimated annual losses (EAL) for each hazard and on a composite scale in the Cabarrus Stanly Union Region as reported in 2024 by the FEMA National Risk Index[14]. Due to the reporting of hazard damages primarily at the county level, it was difficult to determine an accurate annualized loss estimate for each municipality. Therefore, an annualized loss was determined through the damage reported through historical occurrences at the county level. If no historical occurrences were reported, an accurate annualized loss estimate could not be obtained. These values should be used as an additional planning tool or measure risk for determining hazard mitigation strategies throughout the region.

[14] FEMA National Risk Index: https://hazards.fema.gov/nri/. Note that the Tornadoes/Thunderstorms (hail, lightning, strong wind, tornado) and Severe Winter Weather (cold wave, ice storm, winter weather) hazards are calculated using an average of available subhazard EAL data.

TABLE 6.26: POTENTIAL ANNUALIZED LOSSES FOR THE CABARRUS STANLY UNION REGION

Hazard	Cabarrus County	Stanly County	Union County	Total
Composite EAL	$19,360,957	$6,576,042	$29,307,258	**$55,244,257**
Building EAL	$13,410,726	$4,274,419	$15,883,272	**$33,568,417**
Population Equivalence EAL	$5,761,732	$1,831,605	$12,723,941	**$20,317,278**
Agriculture EAL	$188,499	$470,018	$700,046	**$1,358,563**
Drought	$6,475	$7,031	$27,470	$40,976
Excessive Heat	$475,578	$187,839	$265,937	$929,354
Hurricane and Coastal Hazards	$3,745,935	$2,713,060	$6,043,023	$12,502,018
Tornadoes/Thunderstorms	$2,421,858	$679,816	$4,532,881	$7,634,554
Severe Winter Weather	$1,515,430	$81,989	$1,263,439	$2,860,857
Earthquakes	$1,070,435	$307,266	$1,676,573	$3,054,274
Geological	$122,400	$21,900	$21,900	$166,200
Dam Failure	Negligible	Negligible	Negligible	Negligible
Flooding	$1,111,735	$439,175	$552,779	$2,103,689
Wildfires	$110,110	$16,533	$61,176	$187,819
Infectious Disease	Negligible	Negligible	Negligible	Negligible
Hazardous Substances	Negligible	Negligible	Negligible	Negligible
Radiological Emergency	Negligible	Negligible	Negligible	Negligible
Terrorism	Negligible	Negligible	Negligible	Negligible
Cyber	Negligible	Negligible	Negligible	Negligible
Electromagnetic Pulse	Negligible	Negligible	Negligible	Negligible
Civil Disturbance	Negligible	Negligible	Negligible	Negligible
Food Emergency	Negligible	Negligible	Negligible	Negligible

Source: FEMA NRI

As noted previously, all existing and future buildings and populations (including critical facilities) are vulnerable to various natural hazards including drought, hurricane and coastal hazards, tornadoes/thunderstorms, and severe winter weather. Some buildings may be more vulnerable to these hazards based on locations, construction, and building type. **Table 6.27** shows an expanded count of regional critical facilities retrieved from NCEM RMT data grouped by updated FEMA community lifelines. These critical facility counts are planning estimates subject to future changes. Additionally,

Table 6.28 shows the critical facilities vulnerable to additional hazards analyzed in this section. The table lists those assets that are determined to be exposed to each of the identified hazards (marked with an "**X**").

TABLE 6.27: Critical Facilities by FEMA Community Lifeline

FEMA Lifeline	Food	Comms	Hazmat	Shelter	Comms	Supply	Safety	Safety	Medical	Comms	Safety	Hazmat	Safety	Transport	Energy	Safety	Water	N/A
Location	Food & Farm	Banking & Finance	Chemical	Commercial	Comms	Manufacturing	Defense	Government	Healthcare	IT	National Monument	Nuclear	Postal & Shipping	Transport	Energy	Emergency Services	Water	Total
Cabarrus County	**202**	**69**	**0**	**4,279**	**0**	**1,578**	**2**	**483**	**303**	**0**	**0**	**2**	**1**	**1,387**	**8**	**0**	**38**	**8,352**
Concord	25	44	0	1,601	0	509	2	221	188	0	0	2	1	490	3	0	9	3,095
Harrisburg	2	3	0	390	0	144	0	35	33	0	0	0	0	144	1	0	0	752
Kannapolis	7	10	0	1,087	0	236	0	109	40	0	0	0	0	357	3	0	0	1,849
Midland	0	1	0	99	0	44	0	7	7	0	0	0	0	27	0	0	0	185
Mount Pleasant	0	0	0	94	0	44	0	28	4	0	0	0	0	25	0	0	0	195
Unincorporated Area	168	11	0	1,008	0	601	0	83	31	0	0	0	0	344	1	0	29	2,276
Stanly County	**469**	**95**	**0**	**3,236**	**0**	**580**	**0**	**213**	**91**	**0**	**0**	**0**	**0**	**361**	**2**	**0**	**10**	**5,057**
Albemarle	2	46	0	1,194	0	139	0	40	52	0	0	0	0	106	1	0	5	1,585
Badin	0	1	0	95	0	4	0	10	2	0	0	0	0	5	0	0	2	119
Locust	1	5	0	201	0	28	0	8	6	0	0	0	0	19	0	0	0	268
Misenhiemer	0	0	0	16	0	1	0	21	0	0	0	0	0	1	0	0	0	39
New London	2	0	0	65	0	17	0	12	0	0	0	0	0	9	0	0	0	105
Norwood	1	4	0	212	0	17	0	8	2	0	0	0	0	8	0	0	1	253
Oakboro	7	4	0	172	0	27	0	18	3	0	0	0	0	12	1	0	0	244
Red Cross	0	3	0	33	0	5	0	12	0	0	0	0	0	1	0	0	0	54
Richfield	4	4	0	131	0	9	0	6	4	0	0	0	0	7	0	0	1	166
Stanfield	10	2	0	89	0	23	0	12	1	0	0	0	0	11	0	0	0	148
Unincorporated Area	442	26	0	1,028	0	310	0	66	21	0	0	0	0	182	0	0	1	2,076
Union County	**201**	**30**	**0**	**4,101**	**0**	**1,504**	**0**	**685**	**143**	**0**	**0**	**0**	**0**	**528**	**0**	**33**	**18**	**7,243**
Fairview	5	1	0	122	0	59	0	21	2	0	0	0	0	19	0	1	0	230
Hemby Bridge	1	0	0	49	0	11	0	15	0	0	0	0	0	11	0	0	1	88
Indian Trail	10	3	0	482	0	321	0	100	6	0	0	0	0	46	0	1	0	969
Lake Park	0	0	0	12	0	1	0	3	3	0	0	0	0	0	0	0	0	19

Marshville	1	2	0	168	0	56	0	26	3	0	0	0	0	4	0	2	0	262
Marvin	0	0	0	30	0	3	0	5	2	0	0	0	0	13	0	0	0	53
Mineral Springs	14	0	0	70	0	6	0	19	0	0	0	0	0	17	0	1	0	127
Monroe	24	17	0	1,413	0	233	0	140	86	0	0	0	0	59	0	10	13	1,995
Stallings	0	2	0	225	0	129	0	5	5	0	0	0	0	22	0	0	0	388
Unionville	12	0	0	147	0	57	0	30	5	0	0	0	0	30	0	1	0	282
Waxhaw	0	1	0	163	0	13	0	21	7	0	0	0	0	15	0	1	0	221
Weddington	2	1	0	59	0	20	0	39	4	0	0	0	0	39	0	2	0	166
Wesley Chapel	1	1	0	24	0	13	0	15	0	0	0	0	0	10	0	1	0	65
Wingate	0	0	0	39	0	2	0	57	1	0	0	0	0	0	0	1	0	100
Unincorporated Area	131	2	0	1,098	0	580	0	189	19	0	0	0	0	243	0	12	4	2,278
Cabarrus Stanly Union Regional Total	**872**	**194**	**0**	**11,616**	**0**	**3,662**	**2**	**1,381**	**537**	**0**	**0**	**2**	**1**	**2,276**	**10**	**33**	**66**	**20,652**

Source: NCEM Risk Management Tool

TABLE 6.28: At-Risk Critical Facilities

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Cabarrus County																		
CABARRUS COUNTY EMERGENCY OPERATIONS CENTER	EOC/Response	X	X	X	X	X	X			X				X	X	X		X
Allen Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X			X					X	X		
Cold Water Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Concord Fire Department	Fire/EMS	X	X	X	X	X	X			X				X	X	X		X
Concord Fire Department 2	Fire/EMS	X	X	X	X	X	X			X				X	X	X		X
Concord Fire Department 3	Fire/EMS	X	X	X	X	X	X			X					X	X		X
Concord Fire Department 4	Fire/EMS	X	X	X	X	X	X			X					X	X		
Concord Fire Department 5	Fire/EMS	X	X	X	X	X	X			X						X		
Concord Fire Department 6	Fire/EMS	X	X	X	X	X	X			X					X	X		
Concord Fire Department 7	Fire/EMS	X	X	X	X	X	X			X			X	X		X		
Concord Fire Department 8	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
Concord Fire Department 9	Fire/EMS	X	X	X	X	X	X				X			X	X	X		
Concord Fire Department 10	Fire/EMS	X	X	X	X	X	X				X	X						
Concord Fire Department 11	Fire/EMS	X	X	X	X	X	X			X				X	X	X		
Concord Fire Department 12	Fire/EMS	X	X	X	X	X	X			X							X	X
Flowe's Store Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X			X								
Georgeville Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X	X		X				X	X	X		
Harrisburg Fire Department	Fire/EMS	X	X	X	X	X	X			X				X	X	X		X
Harrisburg Fire Department 2	Fire/EMS	X	X	X	X	X	X			X								

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Harrisburg Fire Department 3	Fire/EMS	X	X	X	X	X	X			X								
Jackson Park V.F.D., Inc. 4	Fire/EMS	X	X	X	X	X	X			X					X	X		
Jackson Park V.F.D., Inc. 8	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
Kannapolis Fire Department	Fire/EMS	X	X	X	X	X	X				X			X	X	X		X
Kannapolis Fire Department 2	Fire/EMS	X	X	X	X	X	X				X			X	X	X	X	X
Kannapolis Fire Department 3	Fire/EMS	X	X	X	X	X	X				X				X	X		X
Kannapolis Fire Department 4	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
Kannapolis Fire Department 5	Fire/EMS	X	X	X	X	X	X				X				X	X		
Midland Volunteer Fire and Rescue, Inc.	Fire/EMS	X	X	X	X	X	X				X			X	X	X		X
Midland Volunteer Fire and Rescue, Inc. 2	Fire/EMS	X	X	X	X	X	X				X				X	X		X
Mount Pleasant Fire And Rescue Department	Fire/EMS	X	X	X	X	X	X			X				X	X	X		
Mt. Mitchell Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X					X		
North East Cabarrus Volunteer Fire Department & Community Center, Inc.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Odell Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Odell Volunteer Fire Department, Inc. 2	Fire/EMS	X	X	X	X	X	X				X							
Rimer Volunteer Fire Department and Medical Responders	Fire/EMS	X	X	X	X	X	X				X							
CABARRUS COUNTY EMERGENCY MEDICAL SERVICES STATION 8	Fire/EMS	X	X	X	X	X	X				X			X	X	X		X
CABARRUS COUNTY EMERGENCY MEDICAL SERVICES STATION 7	Fire/EMS	X	X	X	X	X	X			X						X		
CABARRUS COUNTY EMERGENCY MEDICAL SERVICES STATION 4	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
CABARRUS COUNTY EMERGENCY MEDICAL SERVICES STATION 2	Fire/EMS	X	X	X	X	X	X			X				X	X	X	X	X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
CABARRUS RESCUE SQUAD	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
CABARRUS COUNTY EMERGENCY MEDICAL SERVICES STATION 1 - HEADQUARTERS	Fire/EMS	X	X	X	X	X	X			X				X	X	X	X	X
CABARRUS COUNTY EMERGENCY MEDICAL SERVICES STATION 5	Fire/EMS	X	X	X	X	X	X				X				X	X		
CABARRUS COUNTY EMERGENCY MEDICAL SERVICES STATION 3	Fire/EMS	X	X	X	X	X	X			X					X	X		
CABARRUS COUNTY SHERIFFS DEPARTMENT / CABARRUS COUNTY JAIL	Police	X	X	X	X	X	X			X				X	X	X		X
CITY OF CONCORD POLICE DEPARTMENT	Police	X	X	X	X	X	X			X				X	X	X		X
NORTH CAROLINA STATE HIGHWAY PATROL TROOP E DISTRICT VI	Police	X	X	X	X	X	X			X					X	X	X	X
CITY OF CONCORD POLICE DEPARTMENT PATROL DIVISION - DAVID DISTRICT	Police	X	X	X	X	X	X			X					X	X		
CITY OF CONCORD POLICE DEPARTMENT PATROL DIVISION - CHARLIE DISTRICT	Police	X	X	X	X	X	X			X			X	X		X		
CITY OF CONCORD POLICE DEPARTMENT PATROL DIVISION - ADAMS DISTRICT	Police	X	X	X	X	X	X			X				X	X	X	X	X
CITY OF CONCORD POLICE DEPARTMENT PATROL DIVISION - BAKERS DISTRICT	Police	X	X	X	X	X	X			X					X	X	X	X
KANNAPOLIS POLICE DEPARTMENT	Police	X	X	X	X	X	X				X		X	X	X	X	X	X
Bethel Elementary	School	X	X	X	X	X	X				X					X		X
A T Allen Elementary	School	X	X	X	X	X	X			X					X	X		
Central Cabarrus High	School	X	X	X	X	X	X			X					X	X	X	X
Harrisburg Elementary	School	X	X	X	X	X	X			X					X	X	X	X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Wolf Meadow Elementary	School	X	X	X	X	X	X			X			X	X		X	X	X
Weddington Hills Elementary	School	X	X	X	X	X	X			X						X		
Mount Pleasant Elementary	School	X	X	X	X	X	X			X					X	X		
Mount Pleasant Middle	School	X	X	X	X	X	X			X					X	X		
Cabarrus Co Opportunity Sch	School	X	X	X	X	X	X			X			X	X	X	X	X	X
Forest Park Elementary	School	X	X	X	X	X	X				X				X	X		
Beverly Hills Elementary	School	X	X	X	X	X	X			X				X	X	X		X
ColtraneWebb Elementary	School	X	X	X	X	X	X			X				X	X	X		X
Concord Middle	School	X	X	X	X	X	X			X			X	X	X	X		X
Concord High	School	X	X	X	X	X	X			X					X	X		
J N Fries Magnet School	School	X	X	X	X	X	X			X				X	X	X	X	X
Mount Pleasant High	School	X	X	X	X	X	X			X					X	X		
Northwest Cabarrus High	School	X	X	X	X	X	X				X					X		
Northwest Cabarrus Middle	School	X	X	X	X	X	X				X							
Royal Oaks Elementary	School	X	X	X	X	X	X				X				X	X	X	X
Rocky River Elementary	School	X	X	X	X	X	X			X				X		X	X	X
R Brown McAllister Elementary	School	X	X	X	X	X	X			X						X		
W R Odell Elementary	School	X	X	X	X	X	X				X					X		
Winecoff Elementary	School	X	X	X	X	X	X			X					X	X	X	X
A L Brown High	School	X	X	X	X	X	X				X		X	X	X	X	X	X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Fred L Wilson Elementary	School	X	X	X	X	X	X				X				X	X		
Kannapolis Middle	School	X	X	X	X	X	X				X			X	X	X	X	X
Shady Brook Elementary	School	X	X	X	X	X	X				X							X
Jay M Robinson High	School	X	X	X	X	X	X			X					X	X		
W M Irvin Elementary	School	X	X	X	X	X	X				X				X	X		
Carolina International School	School	X	X	X	X	X	X			X								
Cox Mill Elementary	School	X	X	X	X	X	X				X							
C C Griffin Middle	School	X	X	X	X	X	X			X								
Harris Road Middle	School	X	X	X	X	X	X				X					X		
Kannapolis Interm	School	X	X	X	X	X	X				X			X	X	X	X	X
Pitts School Road Elementary	School	X	X	X	X	X	X			X								
Performance Learning Center	School	X	X	X	X	X	X			X				X	X	X	X	X
Long School	School	X	X	X	X	X	X			X			X	X		X	X	X
Carl A Furr Elementary	School	X	X	X	X	X	X			X			X	X				
Charles E Boger Elementary	School	X	X	X	X	X	X				X							
Hickory Ridge High	School	X	X	X	X	X	X			X						X		X
Patriots Elementary	School	X	X	X	X	X	X			X								
Harold E. Winkler Middle	School	X	X	X	X	X	X			X		X				X		
CabarrusKannapolis Early Coll	School	X	X	X	X	X	X				X			X	X	X		
Stonewall Jackson School	School	X	X	X	X	X	X			X					X	X	X	X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Cox Mill High School	School	X	X	X	X	X	X				X							
Hickory Ridge Middle	School	X	X	X	X	X	X			X						X		X
C3 Concord Christian School	School	X	X	X	X	X	X			X			X	X	X	X		
Concord Academy	School	X	X	X	X	X	X			X					X	X		X
Cannon School	School	X	X	X	X	X	X			X						X		
Covenant Classical School	School	X	X	X	X	X	X			X					X	X		
Daniel Academy	School	X	X	X	X	X	X			X			X	X		X	X	X
Faith Christian Academy	School	X	X	X	X	X	X				X				X	X		X
Kingdom Kids Empowerment Acad	School	X	X	X	X	X	X			X				X		X	X	X
Hope Academy	School	X	X	X	X	X	X			X						X		
New Life Christian Academy	School	X	X	X	X	X	X			X				X				
The King's Keep Learning Center	School	X	X	X	X	X	X			X				X	X	X		
R. C. Smith Christian Academy	School	X	X	X	X	X	X				X					X	X	X
Village Christian Academy	School	X	X	X	X	X	X			X				X	X	X	X	X
Rainbow Child Care Center	School	X	X	X	X	X	X			X								
Christ the King Catholic High School	School	X	X	X	X	X	X				X				X	X		
Dell Preparatory Academy	School	X	X	X	X	X	X			X				X	X	X	X	X
Hope Collegiate Academy	School	X	X	X	X	X	X			X						X		
CABARRUS COLLEGE OF HEALTH SCIENCES	School	X	X	X	X	X	X			X				X	X	X	X	X
BARBER-SCOTIA COLLEGE	School	X	X	X	X	X	X			X				X	X	X	X	X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Eye Surgery And Laser Clinic	Medical	X	X	X	X	X	X			X				X	X	X		X
Giles Leisure Home	Medical	X	X	X	X	X	X				X			X	X	X	X	X
Sunderland Hall Family Care Home	Medical	X	X	X	X	X	X			X			X	X	X	X		X
At Home Total Care	Medical	X	X	X	X	X	X			X					X	X		X
Cabarrus County Department of Aging In-Home Service	Medical	X	X	X	X	X	X			X					X	X		
Cabarrus County DSS	Medical	X	X	X	X	X	X				X				X	X		X
Cabarrus Health Alliance/Home Health	Medical	X	X	X	X	X	X		X	X				X	X	X		
Lincare, Inc.	Medical	X	X	X	X	X	X			X					X	X		
LRW Home Care	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Pathways Home Care	Medical	X	X	X	X	X	X			X				X	X	X		X
CAREBRIDGE ASSISTED LIVING COMMUNITY	Medical	X	X	X	X	X	X			X					X	X		
Caremoor Retirement Center, Inc.	Medical	X	X	X	X	X	X				X					X		
Carillon Assisted Living of Harrisburg	Medical	X	X	X	X	X	X			X						X		X
Concord Place	Medical	X	X	X	X	X	X			X						X		
Concord Retirement Home	Medical	X	X	X	X	X	X			X			X	X	X	X		X
Eden Gardens of Concord	Medical	X	X	X	X	X	X			X						X		
First Assembly Living Center	Medical	X	X	X	X	X	X			X					X	X		X
Kannapolis Village LTC Facility	Medical	X	X	X	X	X	X	X			X				X	X		
Morningside of Concord	Medical	X	X	X	X	X	X			X					X	X		X
St. Andrews Living Center	Medical	X	X	X	X	X	X			X				X		X	X	X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Stonebridge House	Medical	X	X	X	X	X	X				X				X	X		
The Country Home	Medical	X	X	X	X	X	X			X					X	X		
Hospice of Cabarrus County, Inc.	Medical	X	X	X	X	X	X			X					X	X		
NorthEast Medical Center	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
300 East D Street	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
402 Needle Ct.	Medical	X	X	X	X	X	X				X			X	X	X		X
404 Needle Court	Medical	X	X	X	X	X	X				X			X	X	X		X
Adult and Adolescent Counseling Connection	Medical	X	X	X	X	X	X				X					X	X	X
Ashbury Home	Medical	X	X	X	X	X	X			X				X	X	X		X
Bost Children's Center	Medical	X	X	X	X	X	X			X					X	X		
Braxton Run	Medical	X	X	X	X	X	X			X								
Brookwood Group Home	Medical	X	X	X	X	X	X			X			X	X	X	X		X
Burlwood	Medical	X	X	X	X	X	X			X								
Cabarrus Counseling and Psychotherapy Associates	Medical	X	X	X	X	X	X			X					X	X		
Cabarrus County Group Home	Medical	X	X	X	X	X	X			X				X	X	X		X
Cabarrus County Group Home #2	Medical	X	X	X	X	X	X				X				X	X		
Cabarrus County Group Home #3	Medical	X	X	X	X	X	X			X				X	X	X		
Cabarrus County Group Home #4	Medical	X	X	X	X	X	X			X			X	X	X	X		X
Cabarrus Workshop	Medical	X	X	X	X	X	X				X					X		
Carolina Addiction and Recovery Environment	Medical	X	X	X	X	X	X			X				X	X	X		X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Carolina Avenue	Medical	X	X	X	X	X	X				X				X	X	X	X
Christy Woods Group Home	Medical	X	X	X	X	X	X				X	X						
Cook Street	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Daffodil Run	Medical	X	X	X	X	X	X			X								
Expeditions	Medical	X	X	X	X	X	X				X			X	X	X		X
Freer Home	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
G&S Services - Corban Court	Medical	X	X	X	X	X	X			X				X	X	X		X
Grace Haven	Medical	X	X	X	X	X	X			X								
Harmony Home	Medical	X	X	X	X	X	X			X					X	X		
Hickory Grove Home	Medical	X	X	X	X	X	X			X						X		X
Hidden Valley Home	Medical	X	X	X	X	X	X				X					X		
Hillcrest	Medical	X	X	X	X	X	X				X			X	X	X		X
Ivey Lane Home	Medical	X	X	X	X	X	X				X			X		X	X	X
Iveywood Home	Medical	X	X	X	X	X	X			X								
Lakewood Home	Medical	X	X	X	X	X	X			X			X	X	X	X		X
Landon Home	Medical	X	X	X	X	X	X			X								
Loving Care Family Services -Tournament	Medical	X	X	X	X	X	X			X					X	X		X
McLeod Addicitve Disease Center-Concord	Medical	X	X	X	X	X	X			X					X	X		X
Michigan Street Home	Medical	X	X	X	X	X	X				X				X	X		X
Moore Home	Medical	X	X	X	X	X	X				X				X	X		

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Oakland Home	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Old Charlotte #2	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Old Charlotte I	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Piedmont Behavioral Healthcare-Cabarrus Center	Medical	X	X	X	X	X	X				X				X	X		X
Progressions 1-Treasure Place	Medical	X	X	X	X	X	X	X		X					X	X	X	X
Progressions 2-Carolina Pointe	Medical	X	X	X	X	X	X			X								
Rembrandt	Medical	X	X	X	X	X	X			X								X
River Run	Medical	X	X	X	X	X	X			X				X	X	X	X	X
RY/AS @ Fairbluff	Medical	X	X	X	X	X	X			X					X	X		
Serenity House	Medical	X	X	X	X	X	X			X					X	X		X
Therapeutic Resources #7	Medical	X	X	X	X	X	X			X			X	X	X	X		
Todd House	Medical	X	X	X	X	X	X			X				X	X	X		X
U.M.A.R. Arey Group Home	Medical	X	X	X	X	X	X				X				X	X		
Valley Home II	Medical	X	X	X	X	X	X			X				X		X	X	X
Wilhelm Place Home	Medical	X	X	X	X	X	X				X					X		
Woodland	Medical	X	X	X	X	X	X			X					X	X		
Youth Care #8	Medical	X	X	X	X	X	X			X					X	X		
Youth Care 2/Youth Care Management Inc.	Medical	X	X	X	X	X	X				X					X		
Youth Care 5	Medical	X	X	X	X	X	X			X					X	X		
Youth Care 7	Medical	X	X	X	X	X	X			X				X		X	X	X

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		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Youth Care I	Medical	X	X	X	X	X	X			X				X		X		
Youth Care III	Medical	X	X	X	X	X	X			X				X	X	X		
Avante at Concord	Medical	X	X	X	X	X	X			X					X	X		X
Brian Center Health & Retirement/Cabarrus	Medical	X	X	X	X	X	X				X				X	X		X
Gardens of Taylor Glen Retirement Community	Medical	X	X	X	X	X	X			X				X	X	X		X
The Heritage at Town Center	Medical	X	X	X	X	X	X			X						X		X
Transitional Health Services of Kannapolis	Medical	X	X	X	X	X	X				X				X	X		
Universal Health Care and Rehabilitation Center	Medical	X	X	X	X	X	X			X				X	X	X		
Mt Pleasant Senior Center	Other	X	X	X	X	X	X			X					X	X		
Governmental Center	Other	X	X	X	X	X	X			X					X	X		X
Courthouse	Other	X	X	X	X	X	X			X					X	X		X
Rotary Square	Other	X	X	X	X	X	X			X					X	X		X
Jail Annex	Other	X	X	X	X	X	X			X					X	X		X
Employee Health Clinic	Other	X	X	X	X	X	X			X				X	X	X	X	X
Concord Library	Other	X	X	X	X	X	X			X					X	X		X
Leased Warehouse	Other	X	X	X	X	X	X			X					X	X		X
Fleet Maintenance Bldg	Other	X	X	X	X	X	X			X					X	X		
Kannapolis Library	Other	X	X	X	X	X	X				X					X		X
Human Services Center	Other	X	X	X	X	X	X				X				X	X		X
STANLY COUNTY																		

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STANLY COUNTY EMERGENCY MANAGEMENT	EOC/Response	X	X	X	X	X	X			X			X	X	X	X	X	X
Albemarle Fire Department	Fire/EMS	X	X	X	X	X	X			X				X	X	X		
Albemarle Fire Department 2	Fire/EMS	X	X	X	X	X	X			X			X	X	X	X		X
Albemarle Fire Department 3	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
Aquadale Rural Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X			X			X	X	X	X	X	X
Aquadale Rural Volunteer Fire Department, Inc. 2	Fire/EMS	X	X	X	X	X	X			X								
Badin Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X			X	X	X	X	X
Bethany Community Fire Department, Incorporated	Fire/EMS	X	X	X	X	X	X			X				X	X	X		
Center Rural Volunteer Fire and Rescue Department, Inc.	Fire/EMS	X	X	X	X	X	X			X				X	X	X	X	X
Center Rural Volunteer Fire and Rescue Department, Inc. 2	Fire/EMS	X	X	X	X	X	X			X								
East Side Volunteer Fire Department, Incorporated	Fire/EMS	X	X	X	X	X	X			X					X	X		
East Side Volunteer Fire Department, Incorporated 2	Fire/EMS	X	X	X	X	X	X			X					X	X		
Endy Volunteer Fire Department, Incorporated	Fire/EMS	X	X	X	X	X	X			X					X	X		
Millingport Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X			X					X	X		
New London Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X			X				X	X	X	X	X
Norwood Fire Department	Fire/EMS	X	X	X	X	X	X			X				X	X	X	X	X
Oakboro Rural Volunteer Fire Department, Incorporated	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Richfield-Misenheimer Fire Department, Incorporated	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Ridgecrest Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X			X								
South Side Volunteer Fire Department, Incorporated	Fire/EMS	X	X	X	X	X	X			X					X	X		X

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South Side Volunteer Fire Department, Incorporated 2	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
West Stanly Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X				X	X		
West Stanly Fire Department, Inc. 2	Fire/EMS	X	X	X	X	X	X				X							
STANLY COUNTY EMERGENCY MEDICAL SERVICES BASE 2	Fire/EMS	X	X	X	X	X	X			X					X	X	X	X
STANLY COUNTY EMERGENCY MEDICAL SERVICES BASE 3	Fire/EMS	X	X	X	X	X	X			X					X	X		
STANLY COUNTY EMERGENCY MEDICAL SERVICES BASE 4	Fire/EMS	X	X	X	X	X	X			X				X	X	X	X	X
STANLY COUNTY RESCUE SQUAD	Fire/EMS	X	X	X	X	X	X			X				X	X	X		X
STANLY COUNTY EMERGENCY MEDICAL SERVICES BASE 1	Fire/EMS	X	X	X	X	X	X			X				X	X	X		
LOCUST POLICE DEPARTMENT	Police	X	X	X	X	X	X				X				X	X		
ALBEMARLE POLICE DEPARTMENT - WEST OFFICE	Police	X	X	X	X	X	X			X			X	X	X	X		X
ALBEMARLE POLICE DEPARTMENT - NORTH COMMUNITY CENTER	Police	X	X	X	X	X	X			X					X	X	X	X
NORTH CAROLINA PARK RANGERS	Police	X	X	X	X	X	X				X							
NORTH CAROLINA STATE HIGHWAY PATROL TROOP E DISTRICT II	Police	X	X	X	X	X	X			X			X	X	X	X		X
BADIN POLICE DEPARTMENT	Police	X	X	X	X	X	X				X			X	X	X	X	X
STANLY COUNTY SHERIFFS OFFICE	Police	X	X	X	X	X	X			X			X	X	X	X	X	X
MISENHEIMER POLICE DEPARTMENT	Police	X	X	X	X	X	X				X				X	X	X	X
ALBEMARLE POLICE DEPARTMENT - EAST OFFICE	Police	X	X	X	X	X	X			X				X	X	X		
NORWOOD POLICE DEPARTMENT	Police	X	X	X	X	X	X			X				X	X	X	X	X
OAKBORO POLICE DEPARTMENT	Police	X	X	X	X	X	X				X		X	X	X	X	X	X
ALBEMARLE POLICE DEPARTMENT	Police	X	X	X	X	X	X			X			X	X	X	X	X	X

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ALBEMARLE POLICE DEPARTMENT	Police	X	X	X	X	X	X			X						X		
STANFIELD POLICE DEPARTMENT	Police	X	X	X	X	X	X				X				X	X	X	X
Aquadale Elementary	School	X	X	X	X	X	X			X			X	X	X	X	X	X
Badin Elementary	School	X	X	X	X	X	X				X			X	X	X	X	X
Millingport Elementary	School	X	X	X	X	X	X			X					X	X		
North Stanly Middle	School	X	X	X	X	X	X			X			X	X	X	X	X	X
North Stanly High	School	X	X	X	X	X	X			X			X	X	X	X	X	X
Norwood Elementary	School	X	X	X	X	X	X			X				X	X	X	X	X
Stanfield Elementary	School	X	X	X	X	X	X				X			X	X	X	X	X
West Stanly High	School	X	X	X	X	X	X			X					X	X		
Albemarle High	School	X	X	X	X	X	X			X			X	X	X	X	X	X
Albemarle Middle	School	X	X	X	X	X	X			X			X	X	X	X	X	X
Central Elementary	School	X	X	X	X	X	X			X			X	X	X	X	X	X
Endy Elementary	School	X	X	X	X	X	X			X					X	X		
East Albemarle Elementary	School	X	X	X	X	X	X			X			X	X	X	X		
Locust Elementary	School	X	X	X	X	X	X			X				X	X	X		
Oakboro Elementary	School	X	X	X	X	X	X				X			X	X	X		X
South Stanly High	School	X	X	X	X	X	X			X			X	X			X	X
South Stanly Middle	School	X	X	X	X	X	X			X				X		X	X	X
Gray Stone Day	School	X	X	X	X	X	X				X				X	X	X	X

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West Stanly Middle School	School	X	X	X	X	X	X			X						X		
Richfield Elementary	School	X	X	X	X	X	X				X		X	X	X	X	X	X
Stanly Early College High	School	X	X	X	X	X	X			X					X	X		
Stanly Academy Learning Center	School	X	X	X	X	X	X			X				X	X	X	X	X
Carolina Christian School	School	X	X	X	X	X	X				X				X	X		
Christ the King Christian Academy	School	X	X	X	X	X	X			X				X	X	X	X	X
Premier Service of Carolina Incorporated	School	X	X	X	X	X	X			X				X	X	X	X	X
Heritage Classical Academy	School	X	X	X	X	X	X			X				X	X	X	X	X
Park Ridge Christian School	School	X	X	X	X	X	X			X				X	X	X	X	X
Scholars Academy of Albemarle	School	X	X	X	X	X	X			X			X	X	X	X	X	X
Straitway Baptist School	School	X	X	X	X	X	X			X				X	X	X	X	X
Tillery Christian Academy	School	X	X	X	X	X	X			X						X		X
Dayspring Christian Academy	School	X	X	X	X	X	X			X					X	X		
STANLY COMMUNITY COLLEGE	School	X	X	X	X	X	X			X					X	X		
PFEIFFER UNIVERSITY MISENHEIMER CAMPUS	School	X	X	X	X	X	X				X				X	X	X	X
Stanly Memorial Hospital Cardiac Rehabilitation Pro	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Forever Young Retreat	Medical	X	X	X	X	X	X			X					X	X		
The Homeplace	Medical	X	X	X	X	X	X			X		X			X	X		
Albemarle Homecare Services, Inc.	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Alliance Medical, Inc.	Medical	X	X	X	X	X	X			X				X	X	X	X	X

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Continuum Home Care of Piedmont	Medical	X	X	X	X	X	X			X				X				
Home Care of the Carolinas	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Lincare, Inc.	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Piedmont Homecare Agency	Medical	X	X	X	X	X	X			X				X	X	X		
Stanly County Home Health Agency	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Stanly County Senior Services Department	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Oakboro Baptist Church Home for the Aged	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Spring Arbor of Albemarle	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
The Taylor House	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Woodhaven Court	Medical	X	X	X	X	X	X			X				X	X	X		
Hospice of Stanly County, Inc.	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Stanly Memorial Hospital	Medical	X	X	X	X	X	X			X				X	X	X	X	X
2304 Edgewood Street	Medical	X	X	X	X	X	X			X				X	X	X		
A. Jack Wall Group Home	Medical	X	X	X	X	X	X			X						X		
Albemarle House	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Anderson Road Group Home	Medical	X	X	X	X	X	X			X			X	X	X	X		
Better Day	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Danritch Group Home	Medical	X	X	X	X	X	X				X			X	X	X	X	X
Durrett Home	Medical	X	X	X	X	X	X			X			X	X	X	X		
East Main Street Group Home	Medical	X	X	X	X	X	X			X			X	X		X		X

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Gary Cowan Group Home	Medical	X	X	X	X	X	X			X				X	X	X		X
GHA Day ServiceS	Medical	X	X	X	X	X	X			X				X	X	X		
Graystone Home	Medical	X	X	X	X	X	X			X			X	X		X		
Helping Hands Care Mgmt. Svcs. Inc. (Hazel House)	Medical	X	X	X	X	X	X			X			X	X	X	X		X
Holbrook Home	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Julius Cohen House/Arc Services, Inc.	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Lafayette Group Home	Medical	X	X	X	X	X	X			X						X		X
Marie G. Smith Group Home	Medical	X	X	X	X	X	X			X				X	X	X		
Moss Springs Group Home I & II	Medical	X	X	X	X	X	X			X					X	X		
Options of Albemarle, Inc.	Medical	X	X	X	X	X	X			X			X	X		X		
Piedmont Behavioral Healthcare-Stanly Center	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Piedmont House	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Robert W. Thompson Group Home	Medical	X	X	X	X	X	X			X				X	X	X		
St. Peter's Group Home	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Stanly Industrial Services	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Stanly Industrial Services-Charter Street	Medical	X	X	X	X	X	X			X				X	X	X		
Superior Healthcare Services	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Troy Road Group Home	Medical	X	X	X	X	X	X			X				X	X	X		
Uwharrie Group Home	Medical	X	X	X	X	X	X			X			X	X	X	X	X	X
Valleyview Group Home	Medical	X	X	X	X	X	X			X			X	X	X	X		

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Waverly House	Medical	X	X	X	X	X	X			X					X	X		
Wiscassett Group Home	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Woodhurst Home	Medical	X	X	X	X	X	X			X				X	X	X		
Britthaven of Piedmont	Medical	X	X	X	X	X	X			X				X				
Forrest Oakes Healthcare Center	Medical	X	X	X	X	X	X			X				X	X	X		
Lutheran Home-Albemarle	Medical	X	X	X	X	X	X			X				X	X	X	X	X
Stanly Manor	Medical	X	X	X	X	X	X			X		X	X	X	X	X		
Albemarle Correctional	Other	X	X	X	X	X	X				X			X				X
Stanly County Jail	Other	X	X	X	X	X	X			X				X	X	X	X	X
UNION COUNTY																		
UNION COUNTY EMERGENCY MANAGEMENT	EOC/Response	X	X	X	X	X	X				X		X	X	X	X	X	X
Allens Crossroads Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X							
Bakers Volunteer Fire and Rescue Department, Inc.	Fire/EMS	X	X	X	X	X	X				X		X	X			X	X
Beaver Lane Volunteer Rescue & Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
Fairview Fire & Rescue Association	Fire/EMS	X	X	X	X	X	X				X				X	X		
Griffith Road Volunteer Fire Department, Inc. 13	Fire/EMS	X	X	X	X	X	X				X					X		
Hemby Bridge Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X							
Jackson Community Volunteer Fire and Rescue, Inc.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Lanes Creek Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X				X	X		
Mineral Springs Volunteer Fire and Rescue Department, Inc. 15	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X

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Mineral Springs Volunteer Fire and Rescue Department, Inc. 16	Fire/EMS	X	X	X	X	X	X				X							
Monroe Fire Department 1	Fire/EMS	X	X	X	X	X	X				X		X	X	X	X	X	X
Monroe Fire Department 2	Fire/EMS	X	X	X	X	X	X				X			X	X	X	X	X
Monroe Fire Department 3	Fire/EMS	X	X	X	X	X	X				X			X	X	X		X
Monroe Fire Department 4	Fire/EMS	X	X	X	X	X	X				X		X	X		X	X	X
Monroe Fire Department 5	Fire/EMS	X	X	X	X	X	X				X				X	X		
New Salem Volunteer Fire Department, Inc. 4	Fire/EMS	X	X	X	X	X	X				X				X	X		
New Salem Volunteer Fire Department, Inc. 5	Fire/EMS	X	X	X	X	X	X				X				X	X		
New Salem Volunteer Fire Department, Inc. 6	Fire/EMS	X	X	X	X	X	X				X							
New Salem Volunteer Fire Department, Inc. 7	Fire/EMS	X	X	X	X	X	X				X							
Providence Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X							
Sandy Ridge Fire and Rescue Department, Inc.	Fire/EMS	X	X	X	X	X	X				X							
Stack Road Volunteer Fire Department & Rescue Squad, Inc.	Fire/EMS	X	X	X	X	X	X				X							
Stallings Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X		X	X				X
Town of Unionville Volunteer Fire Department, Inc. 21	Fire/EMS	X	X	X	X	X	X				X							
Town of Unionville Volunteer Fire Department, Inc. 22	Fire/EMS	X	X	X	X	X	X				X				X	X		
Waxhaw Community Volunteer Fire Department and Rescue Squad, Inc. 18	Fire/EMS	X	X	X	X	X	X				X				X	X		X
Waxhaw Community Volunteer Fire Department and Rescue Squad, Inc. 27	Fire/EMS	X	X	X	X	X	X				X							
Wesley Chapel Volunteer Fire Department, Inc. 41	Fire/EMS	X	X	X	X	X	X				X				X	X		

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Wesley Chapel Volunteer Fire Department, Inc. 42	Fire/EMS	X	X	X	X	X	X				X					X		
Wesley Chapel Volunteer Fire Department, Inc. 43	Fire/EMS	X	X	X	X	X	X				X							
Wesley Chapel Volunteer Fire Department, Inc. 44	Fire/EMS	X	X	X	X	X	X				X					X		
Wingate Volunteer Fire Department, Inc.	Fire/EMS	X	X	X	X	X	X				X				X	X	X	X
UNION EMERGENCY MEDICAL SERVICES	Fire/EMS	X	X	X	X	X	X				X			X	X	X	X	X
CITY OF WAXHAW POLICE DEPARTMENT	Police	X	X	X	X	X	X				X				X	X	X	X
MONROE POLICE DEPARTMENT	Police	X	X	X	X	X	X				X		X	X	X	X	X	X
MARSHVILLE POLICE DEPARTMENT	Police	X	X	X	X	X	X				X			X	X	X	X	X
NORTH CAROLINA STATE HIGHWAY PATROL TROOP H HEADQUARTERS / TROOP H DISTRICT 3	Police	X	X	X	X	X	X				X				X	X		X
UNION COUNTY SHERIFFS OFFICE / UNION COUNTY JAIL	Police	X	X	X	X	X	X				X		X	X	X	X	X	X
STALLINGS POLICE DEPARTMENT	Police	X	X	X	X	X	X				X		X	X				X
WINGATE POLICE DEPARTMENT	Police	X	X	X	X	X	X				X				X	X	X	X
Benton Heights Elementary	School	X	X	X	X	X	X				X		X	X	X	X	X	X
Parkwood High	School	X	X	X	X	X	X				X				X	X		
Parkwood Middle	School	X	X	X	X	X	X				X				X	X		
Hemby Bridge Elementary	School	X	X	X	X	X	X				X							
Sardis Elementary	School	X	X	X	X	X	X				X			X		X		
Sun Valley Middle	School	X	X	X	X	X	X				X							
Piedmont High	School	X	X	X	X	X	X				X							
Forest Hills High	School	X	X	X	X	X	X				X				X	X	X	X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
East Union Middle	School	X	X	X	X	X	X				X		X	X	X	X	X	X
Marshville Elementary	School	X	X	X	X	X	X				X			X	X	X	X	X
New Salem Elementary	School	X	X	X	X	X	X				X				X	X		
Weddington Elementary	School	X	X	X	X	X	X				X				X	X		
Weddington Middle	School	X	X	X	X	X	X				X				X	X		
Western Union Elementary	School	X	X	X	X	X	X				X				X	X		X
East Elementary	School	X	X	X	X	X	X				X			X	X	X	X	X
Fairview Elementary	School	X	X	X	X	X	X				X				X	X		
Health Sciences Academy at Monroe Middle	School	X	X	X	X	X	X				X					X		X
Indian Trail Elementary	School	X	X	X	X	X	X				X			X			X	X
Monroe High	School	X	X	X	X	X	X				X				X	X		X
Piedmont Middle	School	X	X	X	X	X	X				X							
Prospect Elementary	School	X	X	X	X	X	X				X				X	X		
Shiloh Elementary	School	X	X	X	X	X	X				X							
Shiloh Valley Primary School	School	X	X	X	X	X	X				X	X						
Sun Valley High	School	X	X	X	X	X	X				X			X				X
Union Elementary	School	X	X	X	X	X	X				X							
South Providence	School	X	X	X	X	X	X				X				X	X	X	X
Central Academy of Technology	School	X	X	X	X	X	X				X					X		X
Unionville Elementary	School	X	X	X	X	X	X				X							

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Walter Bickett Elementary	School	X	X	X	X	X	X				X			X	X	X		X
Walter Bickett Education Center	School	X	X	X	X	X	X				X			X	X	X		X
Waxhaw Elementary	School	X	X	X	X	X	X				X				X	X	X	X
Wesley Chapel Elementary	School	X	X	X	X	X	X				X	X			X	X		
Wingate Elementary	School	X	X	X	X	X	X				X			X	X	X	X	X
Union Academy Charter School	School	X	X	X	X	X	X				X			X	X	X		X
Weddington High	School	X	X	X	X	X	X				X				X	X		
Porter Ridge Elementary	School	X	X	X	X	X	X				X							
Antioch Elementary	School	X	X	X	X	X	X				X							
Marvin Elementary	School	X	X	X	X	X	X				X							
Kensington Elementary	School	X	X	X	X	X	X				X							
Porter Ridge High School	School	X	X	X	X	X	X				X							
Porter Ridge Middle School	School	X	X	X	X	X	X				X							
Rock Rest Elementary	School	X	X	X	X	X	X				X					X		
Union County Early College	School	X	X	X	X	X	X				X							X
Marvin Ridge Middle	School	X	X	X	X	X	X				X							
Marvin Ridge High	School	X	X	X	X	X	X				X							
Rea View Elementary	School	X	X	X	X	X	X				X					X		
New Town Elementary	School	X	X	X	X	X	X				X							
Rocky River Elementary	School	X	X	X	X	X	X				X					X		

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Sandy Ridge Elementary	School	X	X	X	X	X	X				X							
Stallings Elementary	School	X	X	X	X	X	X				X			X		X		
Sun Valley Elementary	School	X	X	X	X	X	X				X	X						
Poplin Elementary	School	X	X	X	X	X	X				X	X				X		
Cuthbertson High	School	X	X	X	X	X	X				X							
Cuthbertson Middle	School	X	X	X	X	X	X				X							
Wolfe School	School	X	X	X	X	X	X				X					X		X
Anderson Academy	School	X	X	X	X	X	X				X					X		X
Abundant Life Christian Academy	School	X	X	X	X	X	X				X							
Fellowship Christian School	School	X	X	X	X	X	X				X				X	X	X	X
Covenant Christian Academy	School	X	X	X	X	X	X				X					X		
First Assembly Christian School	School	X	X	X	X	X	X				X					X	X	X
Grace Academy	School	X	X	X	X	X	X				X			X				X
Marvin Academy	School	X	X	X	X	X	X				X					X		
Arborbrook Christian Academy	School	X	X	X	X	X	X				X							
NorthPoint Christian Academy	School	X	X	X	X	X	X				X				X	X		
Creative Christian Academy	School	X	X	X	X	X	X				X			X				X
Lee Park Preparatory School	School	X	X	X	X	X	X				X				X	X		
Shining Light Baptist Academy	School	X	X	X	X	X	X				X					X	X	X
Thales Academy	School	X	X	X	X	X	X				X				X	X		

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Tabernacle Christian School	School	X	X	X	X	X	X				X		X	X		X	X	X
Union Christian Academy	School	X	X	X	X	X	X				X					X		
Union Multi-Purpose School	School	X	X	X	X	X	X				X		X	X	X	X		
Metrolina Christian Academy	School	X	X	X	X	X	X				X				X	X		X
Weddington Christian Academy	School	X	X	X	X	X	X				X				X	X		
WINGATE UNIVERSITY	School	X	X	X	X	X	X				X				X	X	X	X
URMC Cardiac Rehabilitation Program	Medical	X	X	X	X	X	X				X			X	X	X		X
Christian Family Care Home	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Christian Family Care Home II	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Helms Rest Home	Medical	X	X	X	X	X	X				X				X	X	X	X
White Store Road Family Care Home of Monroe	Medical	X	X	X	X	X	X				X				X	X		
American HomePatient	Medical	X	X	X	X	X	X				X			X	X	X		X
Council on Aging In-Home Services	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Home Healthcare Specialist, Inc.	Medical	X	X	X	X	X	X				X					X		X
Lincare, Inc.	Medical	X	X	X	X	X	X				X			X	X	X		X
Monroe Home Medical	Medical	X	X	X	X	X	X				X			X	X	X		X
Neighborhood Nurses	Medical	X	X	X	X	X	X				X				X	X		X
Quality Health Care Services, Inc.	Medical	X	X	X	X	X	X				X			X	X	X		X
Total Care, Inc.	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Union County DSS	Medical	X	X	X	X	X	X				X			X	X	X		X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Union Regional Home Care	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Elizabethan Gardens	Medical	X	X	X	X	X	X				X				X	X	X	X
Hillcrest Church Rest Home	Medical	X	X	X	X	X	X				X					X		
Monroe Manor Rest & Retirement Home, Inc.	Medical	X	X	X	X	X	X				X					X		
Monroe Manor Rest & Retirement II, Inc.	Medical	X	X	X	X	X	X				X					X		
Monroe Square Assisted Living Facility	Medical	X	X	X	X	X	X				X			X	X	X		X
The Discovery Program at Monroe Square	Medical	X	X	X	X	X	X				X			X	X	X		X
Union Park	Medical	X	X	X	X	X	X				X					X		X
Woodridge Assisted Living Facility	Medical	X	X	X	X	X	X				X				X	X		
Hospice of Union County, Inc.	Medical	X	X	X	X	X	X				X		X	X	X	X		X
Atrium Health Union Hospital	Medical	X	X	X	X	X	X				X			X	X	X		X
Atrium Healthcare Union West Hospital	Medical	X	X	X	X	X	X				X	X	X	X	X	X	X	X
Atrium Healthcare Waxhaw Hospital	Medical	X	X	X	X	X	X				X				X	X		
Agape I	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Agape II	Medical	X	X	X	X	X	X				X					X		
Alliance Human Services, Inc.	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Americas Addiction Trtmnt-107 Winchester Drive	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Blair Home	Medical	X	X	X	X	X	X				X		X	X	X	X		X
Blakeney Home 2	Medical	X	X	X	X	X	X				X			X	X	X		X
Blakeney Home One	Medical	X	X	X	X	X	X				X			X	X	X		X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Caldwell Home	Medical	X	X	X	X	X	X				X					X		X
Camden Road Home	Medical	X	X	X	X	X	X				X							
Chastity's Place	Medical	X	X	X	X	X	X				X				X	X		
Chemical Dependency and Court Service	Medical	X	X	X	X	X	X				X		X	X		X	X	X
Clearwater	Medical	X	X	X	X	X	X				X					X		
Colvin Home	Medical	X	X	X	X	X	X				X							
Crowder Home	Medical	X	X	X	X	X	X				X			X	X	X		X
Crowder Home	Medical	X	X	X	X	X	X				X			X		X		X
Davidson Home	Medical	X	X	X	X	X	X				X							
Edgehill Home	Medical	X	X	X	X	X	X				X				X	X	X	X
Elizabeth House	Medical	X	X	X	X	X	X				X				X	X		
Fairley Home	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
First Choice Youth and Family Services	Medical	X	X	X	X	X	X	X			X		X	X		X	X	X
First Step Recovery Ctr. of Union Reg. Medical Cent	Medical	X	X	X	X	X	X				X			X	X	X		X
Franklin Home	Medical	X	X	X	X	X	X				X			X	X	X	X	X
Friendship Home	Medical	X	X	X	X	X	X				X			X	X	X		
Griffith Road Home	Medical	X	X	X	X	X	X				X					X		
Haile's Youth and Family Svcs. -Fincher Home	Medical	X	X	X	X	X	X				X			X				
Hearthwood Gardens	Medical	X	X	X	X	X	X				X	X	X	X	X	X	X	X
Houser Home	Medical	X	X	X	X	X	X				X			X	X	X		X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Ivey Home	Medical	X	X	X	X	X	X				X					X		
Jeff's House	Medical	X	X	X	X	X	X				X			X	X	X		X
Jireh Youth and Family Home	Medical	X	X	X	X	X	X				X				X	X	X	X
Karen Lane Home	Medical	X	X	X	X	X	X				X							
Lake Monroe Home	Medical	X	X	X	X	X	X				X					X		
Lasalle Home	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
LifeSpan Circle School - Indian Trail	Medical	X	X	X	X	X	X				X			X		X		
LifeSpan-Union County	Medical	X	X	X	X	X	X				X				X	X		X
Marsh Therapeutic Home	Medical	X	X	X	X	X	X				X				X	X		
Marsh Therapeutic Home #2	Medical	X	X	X	X	X	X				X				X	X	X	X
Massey Home	Medical	X	X	X	X	X	X				X			X		X		X
McGee Home	Medical	X	X	X	X	X	X				X				X	X		X
McGee Home	Medical	X	X	X	X	X	X				X				X	X		
Meadowview Home	Medical	X	X	X	X	X	X				X				X	X		
Medina Home	Medical	X	X	X	X	X	X				X			X	X	X		X
Myers Home	Medical	X	X	X	X	X	X				X				X	X		
Nelda Home	Medical	X	X	X	X	X	X				X				X	X	X	X
New Beginnings-Union County	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Next Generation Educational Behavioral Center	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
North Ridge Group Home	Medical	X	X	X	X	X	X				X				X	X		X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
Patterson Group Home	Medical	X	X	X	X	X	X				X					X		
Piedmont Behavioral Healthcare-Union Center	Medical	X	X	X	X	X	X				X			X	X	X		X
Piedmont Vocational Alternatives	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Residential Support Services/Callahan Home	Medical	X	X	X	X	X	X				X							
Richardson Home	Medical	X	X	X	X	X	X				X		X	X		X	X	X
Richardson Street Home	Medical	X	X	X	X	X	X				X		X	X		X	X	X
RIDGEFIELD HOME	Medical	X	X	X	X	X	X				X				X	X		
Self Start Inc. -Hillcrest Home	Medical	X	X	X	X	X	X				X					X		
Serenity Hills	Medical	X	X	X	X	X	X				X	X			X	X		
Serenity House	Medical	X	X	X	X	X	X				X				X	X		
Shady Pines	Medical	X	X	X	X	X	X				X	X	X	X	X	X	X	X
Sharon Home	Medical	X	X	X	X	X	X				X					X		X
South Providence Day Treatment	Medical	X	X	X	X	X	X				X				X	X	X	X
Southgate	Medical	X	X	X	X	X	X				X	X			X	X		
Stewart Street Home	Medical	X	X	X	X	X	X				X			X	X	X	X	X
Sunnybrook Place	Medical	X	X	X	X	X	X				X			X	X	X		
The Haigler Home	Medical	X	X	X	X	X	X				X							
UCP-Union County Group Home	Medical	X	X	X	X	X	X				X					X		
Union House	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
White Oaks Home	Medical	X	X	X	X	X	X				X					X		X

FACILITY NAME	FACILITY TYPE	Natural								Geological		Other						
		Drought	Excessive Heat	Hurricane & Coastal Hazards	Tornadoes/Thunderstorms	Severe Winter Weather	Earthquakes	Flood 100-year	Flood 500-year	Landslide - High Incidence	Landslide - Mod. Incidence	Wildfires	Fixed HAZMAT 0.5 Mile	Fixed HAZMAT 1 Mile	Mobile HAZMAT 0.5 Mile (Road)	Mobile HAZMAT 1 Mile (Road)	Mobile HAZMAT 0.5 Mile (Rail)	Mobile HAZMAT 1 Mile (Rail)
White Therapeutic Foster Home	Medical	X	X	X	X	X	X				X			X	X	X		X
Wingate Home	Medical	X	X	X	X	X	X				X				X	X	X	X
Wren Court Home	Medical	X	X	X	X	X	X				X			X	X	X		X
Autumn Care of Marshville	Medical	X	X	X	X	X	X				X				X	X	X	X
Brian Center Health & Retirement/Monroe	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X
Lake Park Nursing and Rehabilitation Center	Medical	X	X	X	X	X	X				X		X	X	X	X		X
Rehabilitation and Nursing Center of Monroe	Medical	X	X	X	X	X	X				X					X		X
Mega Force Staffing	Medical	X	X	X	X	X	X				X		X	X	X	X	X	X

Source: NC OneMap

SECTION 7
CAPABILITY ASSESSMENT

This section of the Plan discusses the capability of the communities in the Cabarrus Stanly Union Region to implement hazard mitigation activities. It consists of the following four subsections:

- 7.1 What is a Capability Assessment?
- 7.2 Conducting the Capability Assessment
- 7.3 Capability Assessment Findings
- 7.4 Conclusions on Local Capability

7.1 WHAT IS A CAPABILITY ASSESSMENT?

The purpose of the capability assessment is to determine the ability of a local jurisdiction to implement a comprehensive mitigation strategy and to identify potential opportunities for establishing or enhancing specific mitigation policies, programs, or projects.[1] As in any planning process, it is important to try to establish feasible goals, objectives, and/or actions based on an understanding of the organization's capacity (agencies and/or departments) to implement the proposed strategies. The capability assessment helps determine practical mitigation actions that are likely to be implemented over time, given a local government's planning and regulatory framework, level of administrative and technical support, amount of fiscal resources, and current political climate.

A capability assessment has two primary components: 1) an inventory of a local jurisdiction's relevant plans, ordinances, or programs already in place and 2) an analysis of its capacity to implement mitigation measures. Careful examination of local capabilities helps identify existing gaps, shortfalls, or weaknesses with ongoing government activities that potentially hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. A capability assessment acknowledges the existing mitigation measures (completed or underway) at the local government level, which should be leveraged and enhanced through future mitigation efforts.

The capability assessment completed for the Cabarrus Stanly Union Region serves as a critical planning step and an integral part of the foundation for designing an effective hazard mitigation strategy. Coupled with the risk assessment, the capability assessment helps identify and target meaningful mitigation actions for incorporation in the Mitigation Strategy portion of the Hazard Mitigation Plan. This helps establish the goals and objectives for the region to pursue under this Plan and ensures that such goals and objectives are feasible under given local conditions.

[1] While the Final Rule for implementing the Disaster Mitigation Act of 2000 does not require a local capability assessment to be completed for local hazard mitigation plans, it is a critical step in developing a mitigation strategy that meets the needs of the region while taking into account their own unique abilities. The Rule does state that a community's mitigation strategy should be "based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools" (44 CFR, Part 201.6(c)(3)).

7.2 CONDUCTING THE CAPABILITY ASSESSMENT

To facilitate the inventory and analysis of local government capabilities within Cabarrus, Stanly, and Union counties, a detailed capability assessment was completed for each of the participating jurisdictions based on the information found in existing hazard mitigation plans and local government websites. The assessment compiled information on various "capability indicators" including relevant planning regulatory practices (plans, programs, and ordinances), fiscal resources, administrative and technical capacity, and current political climate. These capability indicators provide insight into existing conditions that support and/or hinder the region's ability to implement hazard mitigation actions.

The standardized indicators used to assess capability promote an extensive inventory of existing local plans, ordinances, programs, and resources that are in place or underway in addition to their overall effect on hazard loss reduction. Additionally, this information can help identify gaps, weaknesses, or conflicts that counties and local jurisdictions can be addressed through newly proposed mitigation actions as part of the hazard mitigation strategy.

The information collected for the capability assessment was incorporated into a database for further analysis. A general scoring methodology was then applied to quantify each jurisdiction's overall capability. According to the scoring system, each capability indicator was assigned a point value based on its relevance to hazard mitigation. The scoring methodology is included in Appendix B: Planning Tools. Using this scoring methodology, a total score[2] and an overall capability rating of "high," "moderate," or "limited" could be determined according to the total number of points received. These classifications are designed to provide a general assessment of local government capability. The results of this capability assessment help inform and the development of an effective and practical mitigation strategy.

7.3 CAPABILITY ASSESSMENT FINDINGS

The findings of the capability assessment are summarized in this Plan to provide insight into the relevant capacity of the participating jurisdictions in the Cabarrus Stanly Union Region to implement hazard mitigation activities. All information is based upon the review of existing hazard mitigation plans and local government websites and input provided by local government officials during meetings of the Cabarrus Stanly Union Regional Hazard Mitigation Planning Team.

7.3.1 Planning and Regulatory Capability

Planning and regulatory capability is based on the successful enforcement and implementation of plans, ordinances, and programs that are intended to guide and manage growth, development, and redevelopment in a responsible manner while maintaining the general welfare of the community. It includes emergency response and mitigation planning, comprehensive land use planning, and transportation planning; the enforcement of zoning or subdivision ordinances and building codes that regulate how land is developed and structures are built; as well as protecting environmental, historic, and cultural resources in the community. These planning initiatives generally present significant opportunities to integrate hazard mitigation principles and practices into the local decision-making process.

[2] The scoring methodology used to quantify and rank the region's capability can be found in Appendix B.

This assessment is designed to provide a general overview of the key planning and regulatory tools and programs in place or underway for the participating jurisdictions in the Cabarrus Stanly Union Region and highlight the potential effect on loss reduction. This information helps identify opportunities to address existing gaps, weaknesses, or conflicts with other initiatives in addition to integrating the implementation of this Plan with existing planning mechanisms where appropriate.

Table 7.1 provides a summary of the relevant local plans, ordinances, and programs already in place or under development for the jurisdictions in the Cabarrus Stanly Union Region. A checkmark (✓) indicates that the given item is currently in place and being implemented. An asterisk (*) indicates that the given item is currently being developed for future implementation. Each of these local plans, ordinances, and programs should be considered available mechanisms for incorporating the requirements of the Cabarrus Stanly Union Regional Hazard Mitigation Plan.

TABLE 7.1: RELEVANT PLANS, ORDINANCES, AND PROGRAMS

Planning / Regulatory Tool	CABARRUS COUNTY	Concord	Harrisburg	Kannapolis	Midland	Mount Pleasant	STANLY COUNTY	Albemarle	Badin	Locust	Misenheimer	New London	Norwood	Oakboro	Red Cross	Richfield	Stanfield	UNION COUNTY	Fairview	Hemby Bridge	Indian Trail	Lake Park	Marshville	Marvin	Mineral Springs	Monroe	Stallings	Unionville	Waxhaw	Weddington	Wesley Chapel	Wingate
Hazard Mitigation Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Comprehensive Land Use Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Floodplain Management Plan	✓	-	-	✓	-	-	✓	-	✓	-	-	-	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-
Open Space Management Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓
Stormwater Management Plan/Ordinance	✓	✓	✓	✓	✓	✓	-	-	-	✓	-	-	-	✓	-	-	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Natural Resource Protection Plan	✓	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flood Response Plan	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emergency Operations Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Continuity of Operations Plan	✓	✓	-	-	-	✓	✓	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Evacuation Plan	-	-	-	-	-	-	✓	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Disaster Recovery Plan	-	✓	-	-	-	-	✓	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Capital Improvements Plan	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	-	-	✓	✓	-	-	✓	✓	-	-	✓	-	-	✓	-	✓	✓	-	✓	-	-	-
Economic Development Plan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Historic Preservation Plan	-	✓	-	-	-	-	-	✓	✓	-	-	-	-	✓	-	-	-	✓	-	-	-	-	-	✓	-	✓	-	-	✓	✓	-	-

Planning / Regulatory Tool	CABARRUS COUNTY	Concord	Harrisburg	Kannapolis	Midland	Mount Pleasant	STANLY COUNTY	Albemarle	Badin	Locust	Misenhiemer	New London	Norwood	Oakboro	Red Cross	Richfield	Stanfield	UNION COUNTY	Fairview	Hemby Bridge	Indian Trail	Lake Park	Marshville	Marvin	Mineral Springs	Monroe	Stallings	Unionville	Waxhaw	Weddington	Wesley Chapel	Wingate
Flood Damage Prevention Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Zoning Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Subdivision Ordinance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Unified Development Ordinance	✓	✓	✓		✓	✓	✓	✓	-	-	-	✓	-	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	-	✓
Post-Disaster Redevelopment Ordinance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	-	-	✓	-	-	✓	✓	-	-
Building Code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fire Code	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
National Flood Insurance Program (NFIP)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NFIP Community Rating System (CRS)	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

A more detailed discussion on the region's planning and regulatory capability follows.

7.3.2 Emergency Management

Hazard mitigation is widely recognized as one of the four primary phases of emergency management. The three other phases include preparedness, response, and recovery. Each phase is interconnected with hazard mitigation, as **Figure 7.1** suggests. Opportunities to reduce potential losses through mitigation practices are most often implemented before disaster strikes, such as the elevation of flood prone structures or the continuous enforcement of policies that prevent and regulate development that is vulnerable to hazards due to its location, design, or other characteristics. Mitigation opportunities can be presented during immediate preparedness or response activities, such as installing storm shutters in advance of a hurricane, and during the long-term recovery and redevelopment process following a hazard event.

FIGURE 7.1: THE FOUR PHASES OF EMERGENCY MANAGEMENT

Planning for each phase is a critical part of a comprehensive emergency management program and is crucial for the successful implementation of hazard mitigation actions. As a result, the capability indicators reviewed a range of emergency management plans in order to assess the Cabarrus Stanly Union Region's willingness to plan as well as the level of technical planning proficiency.

Hazard Mitigation Plan: A hazard mitigation plan represents a community's blueprint for how it intends to reduce the impact of natural and human-caused hazards on people and the built environment. The essential elements of a hazard mitigation plan include a risk assessment, capability assessment, and mitigation strategy.

- All of the participating jurisdictions have previously adopted a hazard mitigation plan.
- Union County participates in the Charlotte UASI THIRA process and has hired a vendor to develop the County's THIRA. This work is set to begin in January 2025, concluding in May.

Disaster Recovery Plan: A disaster recovery plan serves to guide the physical, social, environmental, and economic recovery and reconstruction process following a disaster. In many instances, hazard mitigation principles and practices are incorporated into local disaster recovery plans with the intent of capitalizing on opportunities to break the cycle of repetitive disaster losses. Disaster recovery plans can also lead to the preparation of disaster redevelopment policies and ordinances to be enacted following a hazard event.

- Stanly County has adopted a disaster recovery plan. The Towns of Norwood Oakboro, and Mount Pleasant, as well as the City of Concord have adopted disaster recovery plans.

Emergency Operations Plan: An emergency operations plan outlines responsibility and the means by which resources are deployed during and following an emergency or disaster.

- Cabarrus County, Stanly County, and Union County each maintain emergency operations plans through their respective Emergency Management Departments.

- Cabarrus County municipalities, except for Concord and Kannapolis, have signed onto the County Emergency Operations Plan and other emergency planning documents. The Cities of Concord and City of Kannapolis each have separate emergency operation plans in place, along with the Town of Mount Pleasant.

- Stanly County maintains a countywide Emergency Operations Plan to address emergency operations on behalf of all municipalities in the county. The Towns of Badin and Oakboro, along with the City of Locust, have each adopted a municipal emergency operation plan as well.

- Union County Emergency Management maintains an emergency operation plan. The City of Monroe and the Town of Waxhaw have municipal-level emergency operations plans that are administered by their respective fire departments.

Continuity of Operations Plan: A continuity of operations plan establishes a chain of command, line of succession, and plans for backup or alternate emergency facilities in case of an extreme emergency or disaster event. In addition to general preparedness, communities can realize a number of benefits from having a COOP in place. For example, communities will have a greater capability to adapt to rapid changes in the operational environment and improve the overall effectiveness of their governance by identifying essential functions, processes, and communication methods among various agencies and people within the governing structure.

- Cabarrus and Stanly County have adopted a continuity of operations plan along with the City of Concord, the Town of Mount Pleasant, the Town of Oakboro and the Town of Norwood.

7.3.2 General Planning

The implementation of hazard mitigation activities often involves agencies and individuals beyond the emergency management profession. Stakeholders may include local planners, public works officials, economic development specialists, and others. In many instances, concurrent local planning efforts will help to achieve or complement hazard mitigation goals. Therefore, the capability assessment also included questions pertaining to general planning capabilities and the degree to which hazard mitigation is integrated into other on-going planning efforts in the Cabarrus Stanly Union Region.

Comprehensive Land Use Plan: A comprehensive land use plan establishes the overall vision for what a community wants to be and serves as a guide for future governmental decision making. Typically, a comprehensive plan contains sections on demographic conditions, land use, transportation elements, and community facilities. Given the broad nature of the plan and its regulatory standing in many communities, the integration of hazard mitigation measures into the comprehensive plan can enhance the likelihood of achieving risk reduction goals, objectives, and actions.

- Cabarrus County has adopted individual small area plans that comprise a comprehensive land use plan. The Town of Harrisburg is utilizing a comprehensive plan partnered with the county. The County also has adopted two older area plans with Midland and Mount Pleasant who have also, more recently, developed their own comprehensive land use plans that Cabarrus County did not adopt. All of the remaining municipalities in Cabarrus County have

adopted their own comprehensive land use plans.

- Stanly County has adopted a county land use plan. All municipalities in Stanly County, apart from the Towns of Badin, New London, and Richfield, have also adopted land use plans. The Towns of Badin, New London, and Richfield operate under their newly developed respective municipal plans.

- Union County has also adopted a comprehensive land use plan which applies to the unincorporated county, and the Town of Hemby Bridge All of the remaining municipalities in Union County have adopted comprehensive plans.

Capital Improvements Plan: A capital improvements plan guides the scheduling of spending on public improvements. A capital improvements plan can serve as an important mechanism for guiding future development away from identified hazard areas. Limiting public spending in hazardous areas is one of the most effective long-term mitigation actions available to local governments.

- Cabarrus County and all municipalities have each developed a capital improvements plan.
- Stanly County, the Cities of Albemarle and Locust, and the Towns of Norwood, Oakboro, and Stanfield each have a capital improvements plan in place.

- Union County, the Towns of Indian Trail, Stallings, and Waxhaw, the City of Monroe, and the Village of Marvin and Wesley Chapel also have capital improvements plans to guide the schedule of spending on public improvements.

Historic Preservation Plan: A historic preservation plan is intended to preserve historic structures or districts within a community. An often overlooked aspect of the historic preservation plan is the assessment of buildings and sites located in areas subject to natural hazards and the identification of ways to reduce future damages. This may involve retrofitting or relocation techniques that account for the need to protect buildings that do not meet current building standards or are within a historic district that cannot easily be relocated out of harm's way.

- Union County is the only participating county that has a historic preservation plan. The following municipalities also have historic preservation plans: the City of Concord, the City of Albemarle, the Town of Badin, the Town of Oakboro, the City of Monroe, the Town of Waxhaw, the Town of Weddington, the Village of Marvin, and the Village of Wesley Chapel.

Zoning Ordinance: Zoning represents the primary means by which land use is controlled by local governments. As part of a community's police power, zoning is used to protect the public health, safety, and welfare of those in each jurisdiction that maintains zoning authority. A zoning ordinance is the mechanism through which zoning is typically implemented.

- All jurisdictions participating in this multi-jurisdictional plan have adopted zoning ordinances.
- The Cabarrus County Zoning ordinance does not allow development in the floodplain for new

subdivisions and requires anything over five lots to incorporate floodplain into the required open space.

Subdivision Ordinance: A subdivision ordinance is intended to regulate the development of residential, commercial, industrial, or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Subdivision design that accounts for natural hazards can dramatically reduce the exposure of future development.

- All of the jurisdictions participating in this multi-jurisdictional plan, with the exception of the Town of Badin and the Village of Misenhiemer, have subdivision regulations in place.

Building Codes, Permitting, and Inspections: Building codes regulate construction standards. In many communities, permits and inspections are required for new construction. Decisions regarding the adoption of building codes (that account for hazard risk), the type of permitting process required both before and after a disaster, and the enforcement of inspection protocols all affect the level of hazard risk faced by a community.

- North Carolina has a state compulsory building code, which applies throughout the state; however, jurisdictions may adopt codes if approved as providing adequate minimum standards. All of the participating counties and jurisdictions have adopted a building code. The building code is enforced by each county's building inspector.
- The City of Monroe and Town of Waxhaw have their own building inspections departments that enforce the building code within their jurisdictional limits.

The adoption and enforcement of building codes by local jurisdictions is routinely assessed through the Building Code Effectiveness Grading Schedule (BCEGS) program developed by the Insurance Services Office, Inc. (ISO).[3] In North Carolina, the North Carolina Department of Insurance assesses the building codes in effect in a particular community and how the community enforces its building codes *with special emphasis on mitigation of losses from natural hazards*. The results of BCEGS assessments are routinely provided to ISO's member private insurance companies, which in turn may offer ratings credits for new buildings constructed in communities with strong BCEGS classifications. The concept is that communities with well-enforced, up-to-date codes should experience fewer disaster-related losses and, as a result, should have lower insurance rates.

In conducting the assessment, ISO collects information related to personnel qualification and continuing education as well as the number of inspections performed per day. This type of information combined with local building codes is used to determine a grade for that jurisdiction. The grades range from 1 to 10 with a BCEGS grade of 1 representing exemplary commitment to building code enforcement and a grade of 10 indicating less than minimum recognized protection.

7.3.3 Floodplain Management

Flooding represents the greatest natural hazard facing the nation. Accordingly, advanced tools have been developed and are readily available to help reduce the impacts associated with flooding. These

[3] Participation in BCEGS is voluntary and may be declined by local governments if they do not wish to have their local building codes evaluated

tools are among the most developed when compared to other hazard-specific mitigation techniques. In addition to approaches that cut across hazards such as education, outreach, and the training of local officials, the *National Flood Insurance Program* (NFIP) contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments; however, program participation is strongly encouraged by FEMA as a first step to implement and sustain an effective hazard mitigation program. It is therefore used as part of this assessment as a key indicator for measuring local capability.

In order for a county or municipality to participate in the NFIP, they must adopt a local flood damage prevention ordinance that requires jurisdictions to follow established minimum building standards in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by a 100-year flood event and that new development in the floodplain will not exacerbate existing flood problems or increase damage to other properties.

A key service provided by the NFIP is the mapping of identified flood hazard areas. Once completed, the Flood Insurance Rate Maps (FIRMs) are used to assess flood hazard risk, regulate construction practices, and set flood insurance rates. FIRMs are an important source of information to educate residents, government officials, and the private sector about the likelihood of flooding in the community.

Table 7.2 provides NFIP policy and claim information for each participating jurisdiction in the Cabarrus Stanly Union Region.

TABLE 7.2: NFIP POLICY AND CLAIM INFORMATION

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
CABARRUS COUNTY†	05/05/81	11/16/18	107	$ 32,561,000	90	$1,996,809
Concord	03/04/80	11/16/18	193	$ 61,495,000	23	$272,038
Harrisburg	06/30/76	11/16/18	83	$ 24,246,000	54	$1,171,775
Kannapolis	03/25/91	11/16/18	89	$ 28,416,000	16	$1,256,255
Midland	06/01/09	11/16/18	5	$ 1,827,000	2	$8,397
Mount Pleasant	02/24/12	11/16/18	4	$965,000	1	$39,672
STANLY COUNTY†	12/01/81	11/16/18	14	$ 3,704,000	8	$72,431
Albemarle	12/01/81	06/16/09	31	$ 8,185,000	43	$2,625,883
Badin	09/24/02	06/16/09	1	$ 304,000	0	$0
Locust	05/29/03	11/16/18	1	$ 350,000	0	$0
Misenhiemer	02/17/10	06/16/09	2	$ 217,000	0	$0
New London	08/11/10	(NSFHA)	0	$0	0	$0
Norwood	09/21/00	06/16/09(M)	3	$ 926,000	2	$25,933
Oakboro	09/21/00	06/16/09	5	$ 1,365,000	1	$10,622
Red Cross	07/29/10	06/16/09	0	$0	0	$0
Richfield	01/31/12	06/16/09(M)	2	$ 260,800	0	$0
Stanfield	07/15/10	11/16/18	1	$ 28,000	0	$0
UNION COUNTY†	07/18/83	02/19/14	126	$41,242,000	23	$319,352
Fairview	06/09/09	11/16/18	8	$ 2,494,000	3	$48,903
Hemby Bridge	11/09/09	02/19/14	8	$2,414,000	0	$0
Indian Trail	03/21/80	02/19/14	92	$ 28,411,000	10	$124,679
Lake Park	08/17/99	03/02/09	5	$ 2,319,000	0	$0
Marshville	12/15/09	03/02/09	6	$ 1,990,000	0	$0
Marvin	12/28/98	02/19/14	17	$ 5,900,000	0	$0

Jurisdiction	Date Joined NFIP	Current Effective Map Date	NFIP Policies in Force	Insurance in Force	Closed Claims	Total Payments to Date
Mineral Springs	05/17/00	03/02/09	2	$ 500,000	0	$0
Monroe	01/19/83	03/02/09	24	$ 7,008,000	6	$32,304
Stallings	04/05/94	02/19/14	36	$ 11,632,000	3	$97,439
Unionville	09/25/09	03/02/09	9	$ 2,601,000	7	$244,062
Waxhaw	12/28/98	03/02/09	39	$ 12,662,000	0	$0
Weddington	05/03/99	02/19/14	24	$ 7,898,000	1	$3,554
Wesley Chapel	03/12/00	03/02/09	13	$ 4,165,000	4	$426,098
Wingate	02/12/82	03/02/09	3	$ 735,000	0	$0

†Includes unincorporated areas of county only
(NSFHA) – No Special Flood Hazard Area – All Zone C
(M) – No Elevation Determined, all Zone A, C and X
Source: NFIP Community Status information as of December 2024; NFIP claims and policy information as of September 2024

All jurisdictions listed above that are participants in the NFIP will continue to comply with all required provisions of the program and will work to adequately comply in the future utilizing several strategies. For example, the jurisdictions will coordinate with NCEM and FEMA to develop maps and regulations related to special flood hazard areas within their jurisdictional boundaries and, through a consistent monitoring process, will design and improve their floodplain management program in a way that reduces the risk of flooding to people and property.

Community Rating System: An additional indicator of floodplain management capability is the active participation of local jurisdictions in the Community Rating System (CRS). The CRS is an incentive-based program that encourages counties and municipalities to undertake defined flood mitigation activities that go beyond the minimum requirements of the NFIP by adding extra local measures to provide protection from flooding. All of the 18 creditable CRS mitigation activities are assigned a range of point values. As points are accumulated and reach identified thresholds, communities can apply for an improved CRS class rating. Class ratings, which range from 10 to 1, are tied to flood insurance premium reductions as shown in **Table 7.3**. As class rating improves (the lower the number the better), the percent reduction in flood insurance premiums for NFIP policyholders in that community increases.

TABLE 7.3: CRS PREMIUM DISCOUNTS, BY CLASS

CRS Class	Premium Reduction
1	45%
2	40%
3	35%
4	30%
5	25%
6	20%
7	15%
8	10%
9	5%
10	0%

Source: FEMA

Community participation in the CRS is voluntary. Any community that is in full compliance with the rules and regulations of the NFIP may apply to FEMA for a CRS classification better than class 10. The CRS application process has been greatly simplified over the past several years based on community comments. Changes were made with the intent to make the CRS more user-friendly and make extensive technical assistance available for communities who request it.

- Cabarrus County (Class 7) and the City of Concord (Class 7) are the only two jurisdictions in the region that currently participate in the CRS. Participation in the CRS program should be considered as a mitigation action by the other counties and municipalities. The program would be most beneficial to Union County, which has 126 NFIP policies.

Flood Damage Prevention Ordinance: A flood damage prevention ordinance establishes minimum building standards in the floodplain with the intent to minimize public and private losses due to flood conditions.

- All communities participating in the NFIP are required to adopt a local flood damage prevention ordinance. All counties and municipalities participating in this hazard mitigation plan also participate in the NFIP and they all have adopted flood damage prevention regulations and have appointed floodplain managers to oversee enforcement and implementation of the ordinance. In Cabarrus County, the County and each municipality have each designated a floodplain manager that is responsible for enforcing the flood damage prevention ordinance.

Floodplain Management Plan: A floodplain management plan (or a flood mitigation plan) provides a framework for action regarding corrective and preventative measures to reduce flood-related impacts.

- Stanly County has adopted a floodplain management plan. The Towns of Badin, Norwood, and Oakboro have also adopted floodplain management plans.

- Union County has a floodplain management plan in place that also applies to the Town of Hemby Bridge since the county holds planning jurisdiction within that municipality. The

Town of Indian Trail, Town of Marshville, Village of Marvin, Town of Mineral Springs, City of Monroe, Town of Stallings, Town of Waxhaw, Town of Weddington, and Village of Wesley Chapel also have floodplain management plans.

***Open Space Management Plan**:* An open space management plan is designed to preserve, protect, and restore largely undeveloped lands in their natural state and to expand or connect areas in the public domain such as parks, greenways, and other outdoor recreation areas. In many instances, open space management practices are consistent with the goals of reducing hazard losses, such as the preservation of wetlands or other flood-prone areas in their natural state in perpetuity.

- Cabarrus County has developed the Livable Community Blueprint (parks and bicycle/pedestrian plan) for the unincorporated county and all of its municipalities, excluding Midland. The county and all of its municipalities have also adopted the Carolina Thread Trail Master Plan for Cabarrus County Communities and Cabarrus County has also developed a Parks and Recreation Plan through their Active Living and Parks Department.
- Stanly County has adopted the Stanly County Park, Recreation, and Trails Master Plan as well as the Carolina Thread Trail Master Plan for Stanly County Communities. The Town of Oakboro and the Town of Stanfield have also developed municipal-level plans.
- Union County has adopted the Union County Parks and Recreation Master Plan as well as the Carolina Thread Trail Master Plan for Union County Communities. All of the municipalities within the county have adopted these plans or developed municipal-level plans, with the exception of the Town of Unionville.

Stormwater Management Plan: A stormwater management plan is designed to address flooding associated with stormwater runoff. The stormwater management plan is typically focused on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding.

- Cabarrus County has adopted storm water management ordinance and is subject to Phase 2 Post Construction Permitting with the State.
- The Town of Stanfield is the only jurisdiction in Stanly County that has adopted a stormwater ordinance; however, the City of Albemarle, the City of Locust, and Town of Oakboro all include stormwater regulations in other local ordinances.
- Union County and all of its municipalities have a stormwater management plan and/or ordinance in place, with the exception of the Town of Hemby Bridge.

Substantial Damage Estimate Procedures: Properties in communities that participate in the NFIP that are determined to be "substantially damaged" following a flood event must be brought into compliance with the local flood damage prevention ordinance. Determination of substantial damage is a coordinated effort between emergency management, police and fire departments and permitting departments such as planning and building inspections departments. Substantial damage estimating procedures for participating jurisdictions are detailed below.

- **Cabarrus County –** Following flooding events, Cabarrus County Emergency Management coordinates damage inspections and coordinates with other County departments using Accela. Properties identified as being substantially damaged are tracked and as any property improvements are considered, the Floodplain Manager, Building and Tax Officials work together to determine if the property needs to be brought into compliance with the flood ordinance.
- **Stanly County –** Following flooding events, Stanly County Emergency Management coordinates damage inspections and coordinates with other County departments. Properties identified as being substantially damaged are tracked and as any property improvements are considered, the Floodplain Manager, Building and Tax Officials work together to determine if the property needs to be brought into compliance with the flood ordinance.
- **Union County -** The County provided the following information regarding how they conduct substantial damage estimations following a flood:

  Immediately after a substantial flooding event, Union County Emergency Management will coordinate forming Damage Assessment Teams representing various Union County Departments including Building Code Enforcement, Fire Marshal, Storm Water, Planning / Zoning, Local Disaster Recovery Manager, Tax and GIS. This team would be supported by additional teams representing the other municipalities. Union County will be divided into planning zones based on the area(s) affected by flooding. Each team will conduct windshield surveys and assess damage. The Emergency Operations Center (EOC) will track the team's progress and coordinate with other Local, State, and Federal partners as needed.

  Damage assessment will be tracked using a software application and monitored in the EOC. Once homeowners start the permitting process for repairs, this data is referenced and may trigger the structure to come into current building code compliance.

  If a homeowner or applicant comes in to improve the property voluntarily without damage, then substantial improvement protocols are activated. This entails a lengthy review during plan review of the project scope, evaluating the building's depreciated value either by tax assessor value or through an appraisal, and the work is adjusted accordingly depending on the determination. Building Code Enforcement would assist homeowners in obtaining proper permits and would conduct all necessary inspections needed to ensure the structure is safe to occupy.

  - **Village of Marvin –** The Village provided the following information regarding how they conduct substantial damage estimates following a flood:

    During a flood event, the Village Public Works Staff is on call to addresses and assist Union County in monitoring and reporting in hazardous conditions. Immediately after a flood event, employees across multiple agencies that consist of Village Staff (Planning, and Public Works Staff), Village contracted stormwater and transportation engineers, along with the guidance and assistance from Union County inspectors, building officials, NCDOT and NCDPS assess the affected areas. The Village is broken into four areas (Each Branch/Creek/Stream in Floodplain) and each area has a dedicated number of

teams to conduct windshield surveys and assess damage.

This is tracked digitally and on paper forms and then logged into Village Floodplain databases. This database includes all properties that were/are impacted by a SFHA. Once homeowners come in for permits for repair work, this data is referenced and if substantial damage is triggered then the building must come into compliance with all Village ordinances, specifically including Article 18 of the Marvin Development Ordinance.

If a homeowner or applicant comes in to improve the property voluntarily without damage, then substantial improvement protocols are activated. This entails a lengthy review during plan review of the project scope, evaluating the building's depreciated value either by tax assessor value or through an appraisal, and the work is adjusted accordingly depending on the determination. All work is also field verified by Village Staff (potential assistance with NCDPS) Union County inspectors to make sure construction is up to code and in compliance with Village ordinances.

Participating jurisdictions that did not provide substantial damage estimating procedures to include in this plan are in the process of developing written protocols for their processes. These will be added to this plan in future updates.

7.3.4 Administrative and Technical Capability

The ability of a local government to develop and implement mitigation projects, policies, and programs is directly tied to its ability to direct staff time and resources for that purpose. Administrative capability can be evaluated by determining how mitigation-related activities are assigned to local departments and if there are adequate personnel resources to complete these activities. The degree of intergovernmental coordination among departments will also affect administrative capability for the implementation and success of proposed mitigation activities.

Technical capability can generally be evaluated by assessing the level of knowledge and technical expertise of local government employees, such as personnel skilled in using Geographic Information Systems (GIS) to analyze and assess community hazard vulnerability. The Capability Assessment Survey was used to capture information on administrative and technical capability through the identification of available staff and personnel resources.

Table 7.4 provides a summary of the capability assessment results for the Cabarrus Stanly Union Region with regard to relevant staff and personnel resources. A checkmark (✓) indicates the presence of a staff member(s) in that jurisdiction with the specified knowledge or skill.

TABLE 7.4: RELEVANT STAFF / PERSONNEL RESOURCES

Staff / Personnel Resource	CABARRUS COUNTY	Concord	Harrisburg	Kannapolis	Midland	Mount Pleasant	STANLY COUNTY	Albemarle	Badin	Locust	Misenhiemer	New London	Norwood	Oakboro	Red Cross	Richfield	Stanfield	UNION COUNTY	Fairview	Hemby Bridge	Indian Trail	Lake Park	Marshville	Marvin	Mineral Springs	Monroe	Stallings	Unionville	Waxhaw	Weddington	Wesley Chapel	Wingate
Planners with knowledge of land development / land management practices	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	-	-	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Engineers or professionals trained in construction practices related to buildings	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Planners or engineers with an understanding of natural and/or human-caused hazards	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	-
Emergency Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Floodplain Manager	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Land Surveyors	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Scientists familiar with the hazards of the community	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Staff with education or expertise to assess the community's vulnerability to	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Personnel skilled in GIS and/or Hazus	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	-	✓	-	✓	-	✓	✓	-	✓	-	-	✓	✓	✓	✓	✓	✓	✓	✓	-
Resource development staff or grant writers	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	✓	-	-	-	✓	✓	-	-	✓	-	✓	✓

Credit for having a floodplain manager was given to those jurisdictions that have a flood damage prevention ordinance, and therefore an appointed floodplain administrator, regardless of whether the appointee was dedicated solely to floodplain management. Credit was given for having a scientist familiar with the hazards of the community if a jurisdiction has a Cooperative Extension Service or Soil and Water Conservation Department. Credit was also given for having staff with education or expertise to assess the community's vulnerability to hazards if a staff member from the jurisdiction was a participant on the existing hazard mitigation plan's planning committee.

7.3.5 Fiscal Capability

The ability of a local government to take action is often closely associated with the amount of money available to implement policies and projects. This may take the form of outside grant funding awards or locally based revenue and financing. The costs associated with mitigation policy and project implementation vary widely. In some cases, policies are tied primarily to staff time or administrative costs associated with the creation and monitoring of a given program. In other cases, direct expenses

are linked to an actual project, such as the acquisition of flood-prone homes, which can require a substantial commitment from local, state, and federal funding sources. The Capability Assessment Survey was used to capture information on the region's fiscal capability through the identification of locally available financial resources.

Table 7.5 provides a summary of the results for the Cabarrus Stanly Union Region with regard to relevant fiscal resources. A checkmark (✓) indicates that the given fiscal resource is locally available for hazard mitigation purposes (including match funds for state and federal mitigation grant funds) according to the previous county hazard mitigation plans.

TABLE 7.5: RELEVANT FISCAL RESOURCES

Fiscal Tool / Resource	CABARRUS COUNTY	Concord	Harrisburg	Kannapolis	Midland	Mount Pleasant	STANLY COUNTY	Albemarle	Badin	Locust	Misenheimer	New London	Norwood	Oakboro	Red Cross	Richfield	Stanfield	UNION COUNTY	Fairview	Hemby Bridge	Indian Trail	Lake Park	Marshville	Marvin	Mineral Springs	Monroe	Stallings	Unionville	Waxhaw	Weddington	Wesley Chapel	Wingate
Capital Improvement Programming	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	✓	✓	-	-	✓	-	✓	-	-	✓	✓	-	✓	-	✓	-
Community Development Block Grants (CDBG)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Special Purpose Taxes (or taxing districts)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	✓	-	-	-	✓	-	-	-	-	-	-	-	✓	-	-	-	-	-	-
Gas / Electric Utility Fees	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-
Water / Sewer Fees	✓	✓	✓	✓	-	✓	✓	-	✓	✓	-	✓	-	✓	✓	✓	✓	✓	-	-	-	-	✓	-	-	✓	-	-	-	-	-	✓
Stormwater Utility Fees	-	✓	✓	✓	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-	✓	✓	-	-	-	-	-
Development Impact Fees	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Obligation, Revenue, and/or Special Tax Bonds	-	✓	-	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	✓	✓	-	-	-	-	-	-
Partnering Arrangements or Intergovernmental Agreements	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Other: HMGP, FMAP, PDM, EMPG, PA, other Federal and state funding sources, etc.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

7.3.6 Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to reduce the impact of future hazard events. Hazard mitigation may not be a local priority or may conflict with or be seen as an impediment to other goals of the community, such as growth and economic development. Therefore, the local political climate must be considered in designing mitigation strategies as it could be the most difficult hurdle to overcome in accomplishing their adoption and implementation.

The Capability Assessment Survey was used to capture information on political capability of the Cabarrus Stanly Union Region. Previous county-level hazard mitigation plans were reviewed for general examples of local political capability, such as guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (i.e., building codes, floodplain management, etc.).

- The previous county hazard mitigation plans identified existing ordinances that address natural hazards or are related to hazard mitigation such as emergency management, flood damage prevention, watershed protection, soil erosion and sedimentation control, zoning, and subdivision.
- Cabarrus County is committed to incorporating hazard mitigation planning and activities into county operations. Many of the mitigation strategies are in effect through existing county ordinances, most notably the Flood Damage Prevention Ordinance.
- At this time, it is felt that political leadership in Stanly County would be hesitant to enact any policy that would limit industrial or business growth.
- Union County is committed to promoting safety and disaster readiness through a variety of existing ordinances and policies.

7.4 CONCLUSIONS ON LOCAL CAPABILITY

In order to form meaningful conclusions on the assessment of local capability, a quantitative scoring methodology was designed and applied to results of the Capability Assessment Survey. This methodology, further described in Appendix B, attempts to assess the overall level of capability of the Cabarrus Stanly Union Region to implement hazard mitigation actions.

The overall capability to implement hazard mitigation actions varies among the participating jurisdictions. For planning and regulatory capability, the majority of the larger jurisdictions are in the high range and the majority of the smaller jurisdictions are in the moderate range. There is also some variation in the administrative and technical capability among the jurisdictions with larger jurisdictions generally having greater staff and technical resources. The majority of the jurisdictions are in the moderate range for fiscal capability.

Table 7.6 shows the results of the capability assessment using the designed scoring methodology. The capability score is based solely on the information found in existing hazard mitigation plans and readily available on the jurisdictions' government websites. According to the assessment, the average local capability score for all jurisdictions is 37.4, which falls into the moderate capability ranking.

TABLE 7.6: CAPABILITY ASSESSMENT RESULTS

Jurisdiction	Overall Capability Score	Overall Capability Rating
CABARRUS COUNTY	**47**	**High**
Concord	52	High
Harrisburg	35	Moderate
Kannapolis	43	High
Midland	35	Moderate
Mount Pleasant	38	Moderate
STANLY COUNTY	**51**	**High**
Albemarle	37	Moderate
Badin	37	Moderate
Locust	40	High
Misenhiemer	24	Moderate
New London	26	Moderate
Norwood	36	Moderate
Oakboro	48	High
Red Cross	28	Moderate
Richfield	26	Moderate
Stanfield	30	Moderate
UNION COUNTY	**50**	**High**
Fairview	38	Moderate
Hemby Bridge	24	Low
Indian Trail	42	High
Lake Park	30	Moderate

Jurisdiction	Overall Capability Score	Overall Capability Rating
Marshville	39	Moderate
Marvin	38	Moderate
Mineral Springs	36	Moderate
Monroe	51	High
Stallings	39	Moderate
Unionville	28	Moderate
Waxhaw	44	High
Weddington	38	Moderate
Wesley Chapel	37	Moderate
Wingate	29	Moderate

As previously discussed, one of the reasons for conducting a Capability Assessment is to examine local capabilities to detect any existing gaps or weaknesses within ongoing government activities that could hinder proposed mitigation activities and possibly exacerbate community hazard vulnerability. These gaps or weaknesses have been identified for each jurisdiction in the tables found throughout this section. The participating jurisdictions used the Capability Assessment as part of the basis for the Mitigation Actions that are identified in Section 9; therefore, each jurisdiction addresses their ability to expand on and improve their existing capabilities through the identification of their Mitigation Actions.

7.4.1 Linking the Capability Assessment with the Risk Assessment and the Mitigation Strategy

The conclusions of the Risk Assessment and Capability Assessment serve as the foundation for the development of a meaningful hazard mitigation strategy. During the process of identifying specific mitigation actions to pursue, the Regional Hazard Mitigation Planning Team considered not only each jurisdiction's level of hazard risk, but also their existing capability to minimize or eliminate that risk.

SECTION 8
MITIGATION STRATEGY

This section of the Plan provides the blueprint for the participating jurisdictions in the Cabarrus Stanly Union Region to follow to become less vulnerable to its identified hazards. It is based on consensus of the Regional Hazard Mitigation Committee and the findings and conclusions of the *Capability Assessment* and *Risk Assessment*. It consists of the following five subsections:

- 8.1 Introduction
- 8.2 Mitigation Goals
- 8.3 Identification and Analysis of Mitigation Techniques
- 8.4 Selection of Mitigation Techniques for the Cabarrus Stanly Union Region
- 8.5 Plan Update Requirement

8.1 INTRODUCTION

The intent of the Mitigation Strategy is to provide the communities in the Cabarrus Stanly Union Region with the goals that will serve as guiding principles for future mitigation policy and project administration, along with an analysis of mitigation techniques available to meet those goals and reduce the impact of identified hazards. It is designed to be comprehensive, strategic, and functional in nature:

- In being *comprehensive*, the development of the strategy includes a thorough review of all hazards and identifies extensive mitigation measures intended to not only reduce the future impacts of high risk hazards, but also to help the region achieve compatible economic, environmental, and social goals.
- In being *strategic*, the development of the strategy ensures that all policies and projects proposed for implementation are consistent with pre-identified, long-term planning goals.
- In being *functional,* each proposed mitigation action is linked to established priorities and assigned to specific departments or individuals responsible for their implementation with target completion deadlines. When necessary, funding sources are identified that can be used to assist in project implementation.

The first step in designing the Mitigation Strategy includes the identification of mitigation goals. Mitigation goals represent broad statements that are achieved through the implementation of more specific mitigation actions. These actions include both hazard mitigation policies (such as the regulation of land in known hazard areas through a local ordinance) and hazard mitigation projects that seek to address specifically targeted hazard risks (such as the acquisition and relocation of a

repetitive loss structure).

The second step involves the identification, consideration, and analysis of available mitigation measures to help achieve the identified mitigation goals. This is a long-term, continuous process sustained through the development and maintenance of this Plan. Alternative mitigation measures will continue to be considered as future mitigation opportunities are identified, as data and technology improve, as mitigation funding becomes available, and as this Plan is maintained over time.

The third and last step in designing the Mitigation Strategy is the selection and prioritization of specific mitigation actions for the Region (provided separately in Section 9: *Mitigation Action Plan*). Each county and participating jurisdiction has its own Mitigation Action Plan (MAP) that reflects the needs and concerns of that jurisdiction. The MAP represents an unambiguous and functional plan for action and is considered to be the most essential outcome of the mitigation planning process.

The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for the counties and jurisdictions to complete. Each action has accompanying information, such as those departments or individuals assigned responsibility for implementation, potential funding sources, and an estimated target date for completion. The MAP provides those departments or individuals responsible for implementing mitigation actions with a clear roadmap that also serves as an important tool for monitoring success or progress over time. The cohesive collection of actions listed in the MAP can also serve as an easily understood menu of mitigation policies and projects for those local decision makers who want to quickly review the recommendations and proposed actions of the Regional Hazard Mitigation Plan.

In preparing each Mitigation Action Plan for the region, officials considered the overall hazard risk and capability to mitigate the effects of hazards as recorded through the risk and capability assessment process, in addition to meeting the adopted mitigation goals and unique needs of the community.

8.1.1 Mitigation Action Prioritization

In the previous versions of the participating jurisdictions' hazard mitigation plans, not all actions were prioritized. In addition, there needed to be consistency among the counties and jurisdiction regarding how they prioritized their actions. Therefore, during the 2014 update of the Cabarrus Stanly Union Regional plan, the Regional Hazard Mitigation Planning Committee members were tasked with establishing a priority for each action. Prioritization of the proposed mitigation actions was based on the following six factors:

- Effect on overall risk to life and property
- Ease of implementation
- Political and community support
- A general economic cost/benefit review[1]

[1] Only a general economic cost/benefit review was considered by the Regional Hazard Mitigation Planning Committee through the process of selecting and prioritizing mitigation actions. Mitigation actions with "high" priority were determined to be the

- Funding availability
- Continued compliance with the NFIP

The point of contact for each county and the participating jurisdictions helped coordinate the prioritization process by reviewing each action and working with the lead agency/department responsible to determine a priority for each action using the six factors listed above.

Using these criteria, actions were classified as high, moderate, or low priority by the participating jurisdiction officials.

As the actions were reviewed as part of the 2025 update of the plan, each community was asked to review the priority assigned to each action and ensure that the priority had not changed. If the priority of a particular action did change, the participating jurisdictions were asked to revise those priorities accordingly using same criteria as defined above.

8.2 MITIGATION GOALS

44 CFR Requirement
44 CFR Part 201.6(c)(3)(i): The mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

The primary goal of all local governments is to promote the public health, safety, and welfare of its citizens. In keeping with this standard, Cabarrus, Stanly and Union counties and the participating municipalities have developed four goal statements for local hazard mitigation planning in the region. In developing these goals, the project consultant reviewed the goals from the previous plan and discussed them with the Regional Planning Committee.

The proposed regional goals were presented, reviewed, voted on, and accepted by the Planning Committee at their second meeting. Minimal revisions to the wording of the goals were made. Each goal, purposefully broad in nature, serves to establish parameters that were used in developing more mitigation actions. The Cabarrus Stanly Union Regional Mitigation Goals are presented in Table 8.1. Consistent implementation of actions over time will ensure that community goals are achieved.

most cost effective and most compatible with the participating jurisdictions' unique needs. "Medium" and "Low" priority actions were labeled as such because they had a medium and lower qualitative benefit respectively when evaluated against the six factors used to determine action priority. A more detailed cost/benefit analysis will be applied to particular projects prior to the application for or obligation of funding, as appropriate

TABLE 8.1: CABARRUS STANLY UNION REGIONAL MITIGATION GOALS

Goal	
Goal #1	Decrease the community's vulnerability to impacts from future hazard events.
Goal #2	Increase the community's resiliency and internal capabilities so that response and recovery can be quicker and more cost-effective.
Goal #3	Enhance existing county ordinances, regulations, and policies that will reduce the potential damage from hazards.
Goal #4	Protect public health, safety, and welfare.

8.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

44 CFR Requirement
44 CFR Part 201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In formulating the Mitigation Strategy for the Cabarrus Stanly Union Region, a wide range of activities were considered in order to help achieve the established mitigation goals, in addition to addressing any specific hazard concerns. These activities were discussed during the Regional Hazard Mitigation Planning Committee meetings. In general, all activities considered by the Regional Hazard Mitigation Planning Committee can be classified under one of the following six broad categories of mitigation techniques: Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, and Public Awareness and Education. These are discussed in detail below.

8.3.1 Prevention

Preventative activities are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. They are particularly effective in reducing a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial. Examples of preventative activities include:

- Planning and zoning
- Building codes
- Open space preservation
- Floodplain regulations
- Stormwater management regulations
- Drainage system maintenance
- Capital improvements programming
- Riverine / fault zone setbacks

8.3.2 Property Protection

Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations. Examples include:

- Acquisition
- Relocation
- Building elevation
- Critical facilities protection
- Retrofitting (e.g., windproofing, floodproofing, seismic design techniques, etc.)
- Safe rooms, shutters, shatter-resistant glass
- Insurance

8.3.3 Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving or restoring natural areas and their protective functions. Such areas include floodplains, wetlands, steep slopes, and sand dunes. Parks, recreation, or conservation agencies and organizations often implement these protective measures. Examples include:

- Floodplain protection
- Watershed management
- Riparian buffers
- Forest and vegetation management (e.g., fire resistant landscaping, fuel breaks, etc.)
- Erosion and sediment control
- Wetland preservation and restoration
- Habitat preservation
- Slope stabilization

8.3.4 Structural Projects

Structural mitigation projects are intended to lessen the impact of a hazard by modifying the environmental natural progression of the hazard event through construction. They are usually designed by engineers and managed or maintained by public works staff. Examples include:

- Reservoirs
- Dams / levees / dikes / floodwalls
- Diversions / detention / retention
- Channel modification
- Storm sewers

8.3.5 Emergency Services

Although not typically considered a "mitigation" technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:

- Warning systems
- Evacuation planning and management
- Emergency response training and exercises
- Sandbagging for flood protection
- Installing temporary shutters for wind protection

8.3.6. Public Education and Awareness

Public education and awareness activities are used to advise residents, elected officials, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use to protect themselves and their property. Examples of measures to educate and inform the public include:

- Outreach projects
- Speaker series / demonstration events
- Hazard map information
- Real estate disclosure
- Library materials
- School children educational programs
- Hazard expositions

8.4 SELECTION OF MITIGATION TECHNIQUES FOR THE CABARRUS STANLY UNION REGION

In order to determine the most appropriate mitigation techniques for the communities in the Cabarrus Stanly Union Region, the Regional Hazard Mitigation Planning Committee members thoroughly reviewed and considered the findings of the *Capability Assessment* and *Risk Assessment* to determine the best activities for their respective communities. Other considerations included the effect of each mitigation action on overall risk to life and property, its ease of implementation, its degree of political and community support, its general cost-effectiveness, and funding availability (if necessary).

8.5 PLAN UPDATE REQUIREMENT

In keeping with FEMA requirements for plan updates, the Mitigation Actions identified in the previous Version of the regional hazard mitigation plan were evaluated to determine their 2025 implementation status. Updates on the implementation status of each action are provided. Any changes to the relative priority of the actions are noted as well. The mitigation actions provided in Section 9: *Mitigation Action Plan* include the mitigation actions from the previous plans as well as any new mitigation actions proposed through the 2025 planning process. Actions identified as completed in previous versions of the plan have been moved to Appendix E.

SECTION 9
MITIGATION ACTION PLAN

This section includes the listing of the mitigation actions proposed by the participating jurisdictions in the Cabarrus Stanly Union Region. It consists of the following two subsections:

- 9.1 Overview
- 9.2 Mitigation Action Plans

44 CFR Requirement
44 CFR Part 201.6(c)(3)(iii): The mitigation strategy shall include an action plan describing how the actions identified in paragraph (c)(2)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction.

9.1 OVERVIEW

As described in the previous section, the Mitigation Action Plan, or MAP, provides a functional plan of action for each jurisdiction. It is designed to achieve the mitigation goals established in Section 8: *Mitigation Strategy* and will be maintained on a regular basis according to the plan maintenance procedures established in Section 10: *Plan Maintenance*.

Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard risk for the Cabarrus Stanly Union Region. Each action is listed in the MAP in conjunction with background information such as hazard(s) addressed and relative priority. Other information provided in the MAP includes potential funding sources to implement the action should funding be required (not all proposed actions are contingent upon funding). Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for carrying the action out as well as a timeframe for its completion. These implementation mechanisms ensure that the Cabarrus Stanly Union Regional Hazard Mitigation Plan remains a functional document that can be monitored for progress over time. The proposed actions are not listed in priority order, though each has been assigned a priority level of "high," "moderate," or "low" as described below and in Section 8 (page 8.2).

The Mitigation Action Plan is organized by mitigation strategy category (Prevention, Property Protection, Natural Resource Protection, Structural Projects, Emergency Services, or Public Education and Awareness). The following are the key elements described in the Mitigation Action Plan:

- Hazard(s) Addressed—Hazard which the action addresses.
- Relative Priority—High, moderate, or low priority as assigned by the jurisdiction.
- Lead Agency/Department—Department responsible for undertaking the action.
- Potential Funding Sources—Local, State, or Federal sources of funds are noted here, where applicable
- Implementation Schedule—Date by which the action the action should be completed. More information is provided when possible.

- Implementation Status (2025)—Indication of completion, progress, deferment, or no change since the previous plan. If the action is new, that will be noted here.

9.2 MITIGATION ACTION PLANS

The mitigation actions proposed by each of the participating jurisdictions are listed in 32 individual MAPs on the following pages. **Table 9.1** shows the location of each jurisdiction's MAP within this section as well as the number of mitigation actions proposed by each jurisdiction.

TABLE 9.1: INDIVIDUAL MAP LOCATIONS

Location	Page	Number of Mitigation Actions
Cabarrus County	**9:3**	**31**
Concord	9:11	26
Harrisburg	9:17	18
Kannapolis	9:22	22
Midland	9:26	18
Mount Pleasant	9:30	20
Stanly County	**9:46**	**3**
Albemarle	9:51	19
Badin	9:61	5
Locust	9:63	4
Misenhiemer	9:64	2
New London	9:65	2
Norwood	9:66	5
Oakboro	9:67	6
Red Cross	9:68	2
Richfield	9:71	2
Stanfield	9:72	3
Union County	**9:73**	**12**
Fairview	9:77	4
Hemby Bridge	9:81	4
Indian Trail	9:83	6
Lake Park	9:84	7
Marshville	9:86	3
Marvin	9:87	12
Mineral Springs	9:90	5
Monroe	9:91	10
Stallings	9:101	5
Unionville	9:103	3
Waxhaw	9:104	12
Weddington	9:106	8
Wesley Chapel	9:108	7
Wingate	9:110	5

Cabarrus County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Review plan for debris removal and disposal.	Severe Winter Weather	High	Emergency Management, County General Services	Local, EMPG	2030, Annually	Deferred. The plan was updated in February 2018 and will continue to be reviewed on an annual basis.
P-2	Review inclement weather plan for county transportation system.	Severe Winter Weather	High	Emergency Management, Transportation	Local	2030, Annually	Deferred. The plan is reviewed annually and after each major incident and will continue to be reviewed on an annual basis.
P-3	Maintain Flood Damage Prevention Ordinance that is in compliance with state and federal regulations for floodplain management and best practices.	Tornadoes/ Thunderstorms, Hurricane and Coastal Hazards, Flooding	High	Planning and Development, Board of Commissioners, Construction Standards	Local	2030	Adopted new maps and updated state model ordinance on October 15, 2018. Will continue to monitor this action.
P-4	Maintain freeboard of minimum 2' above BFE which exceeds model ordinance requirement of 1'.	Tornadoes/ Thunderstorms, Hurricane and Coastal Hazards, Flooding	High	Planning and Development, Board of Commissioners, Construction Standards	Local	The ordinance will remain as it is until changes occur at state or federal level and/or county is advised to change.	Deferred. Current Flood Damage Prevention Ordinance is in compliance and will remain until changes occur at state or federal level. Requirement for 2' freeboard exceeds minimum 1' requirement established in model ordinance. Updated Fall 2018.
P-5	Adopt revised floodplain maps in a timely manner when received from FEMA.	Tornadoes/ Thunderstorms, Hurricane and Coastal Hazards, Flooding	High	FEMA, NCEM, Planning and Development, Board of Commissioners	Local	When new maps are provided.	Deferred. Updated maps were provided by FEMA in November of 2018. Revised maps will be adopted and FDPO language revised to reflect new dates as needed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
P-6	Continue participation in the Community Rating System to assist with insurance rates for unincorporated Cabarrus County properties subject to maintaining flood insurance.	Tornadoes/ Thunderstorms, Hurricane and Coastal Hazards, Flooding	Moderate	Planning and Development	Local	2030, The County completes recertification forms on an annual basis.	Deferred. Cabarrus County continues to participate in the NFIP CRS Program which applies to unincorporated county properties. Yearly recertification required through ISO and due by August to maintain CRS Program status.
P-7	Maintain policies that discourage growth in flood hazard areas.	Flooding	Moderate	Board of Commissioners, Municipalities	Local	Policies will be reviewed and updated annually.	Continued. In 2005, the Cabarrus County zoning ordinance regulations were updated to include a requirement that for any new subdivisions, the floodplain must be included as part of the new space for new subdivisions over 5 lots. As part of the permitting process, staff provides guidance to applicants regarding alternate placement of structures to avoid locating in regulated floodplain. As of the 2025 update, this ordinance language remains and continues to be enforced.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
P-8	Set up centralized, coordinated permitting process, including effective filing/permitting system to ensure compliance with floodplain regulations. Count building Improvements cumulatively (maintain permit history so when cumulative improvements equal 50% of building value, (substantial improvement) building must be brought up to flood protection standards for new construction). Goal to eventually have all flood hazard endangered buildings brought up to flood protection standards.	Flooding	High	Information Technology Systems	Local	This action will be reviewed annually to document progress.	Deferred. Each jurisdiction is responsible for its own zoning and floodplain development permitting. If a building is considered a substantial improvement, the current construction code must be used. Centralized building permitting and inspections. As of the 2025 update, Cabarrus County has revised their definitions for substantially damaged/substantially improved. Those changes are documented in the Capability Assessment section of this plan.
P-9	Amend Recreation Plan to provide for integration of publicly acquired land into park or greenway system so hazardous areas remain undeveloped in perpetuity (much more effective than removing structures from isolated parcels).	Flooding	Moderate	Planning and Development, FEMA, DENR, NC Parks and Recreation	Local	This action will be reviewed annually to document progress.	Deferred. Both County and School System sites typically include ball fields/park areas in floodplain areas. The County receives credit for this under the CRS. The County was able to document that properties are not going to be developed.
P-10	Review and update hazard mitigation plan.	Flooding	Moderate	Planning and Development, Emergency Management, Board of Commissioners, Municipalities, FEMA, DEQ	Local	2030	Deferred. Currently underway, plan is reviewed and updated annually and after each major incident, complete update performed every 5 years.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
P-11	Monitor hazard mitigation plan to ensure schedules met.	All Hazards	Moderate	Planning and Development, Emergency Management	Local	2030, Annually	Deferred. The County has reviewed the Mitigation Action Plan using the procedures prescribed in the Plan Maintenance Procedures. These procedures will be used to review and update the hazard mitigation plan on an annual basis.
P-12	Develop tracking system to evaluate progress and revise mitigation strategies as necessary.	All Hazards	Moderate	Planning and Development, Emergency Management	Local	2030, Annually	Deferred. The County has reviewed the Mitigation Action Plan using the procedures prescribed in the Plan Maintenance Procedures. These procedures will be used to monitor the hazard mitigation plan on an annual basis. Mitigation strategies and action plan review required as part of annual CRS program renewal process.
Property Protection							
PP-1	Consider prohibiting construction or substantial improvement of buildings within the 100 year floodplain.	Flooding	Moderate	Board of Commissioners, Municipalities, Construction Standards	Local	1-2 years	Deferred: Ordinance currently permits development in the 100 year floodplain, if it is an existing subdivision lot or part of a minor subdivision. For any major subdivisions, 100 year and floodway has to be included in the open space for the development. This is documented in the Capability Assessment section of this plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
PP-2	Acquire properties susceptible to flood damage (voluntary program).	Flooding	Low	Planning and Development, Parks, DENR, NCEM	Federal, State, Local	As funds are available, 2030	Deferred. No properties qualify for SRL in unincorporated areas of the County. There are 13 repetitive loss properties in the County which should be considered for mitigation. This action will be revisited during the 2030 update of the hazard mitigation plan.
PP-3	Identify properties for public acquisition.	Flooding	Low	Planning and Development, FEMA, NCEM, DENR	Federal, State, Local	2030	Deferred. No properties have been acquired as of 2024. This action will be revisited during the 2030 update of the hazard mitigation plan.
PP-4	Establish a list of priority properties for acquisition in the event of a future natural disaster.	Flooding	Low	Planning and Development, FEMA, NCEM, DENR	Federal, State, Local	2030	Deferred. Properties have been identified, will monitor events and update list as applicable. This action will be revisited during the 2030 update of the hazard mitigation plan. The County is seeing flooding in new areas as a result of growth and changes to streams and flows.
PP-5	Evaluate safety and security of critical services (public and private) and facilities—roads, bridges, water, sewer, electricity, etc.—and critical facilities— fire, rescue, medical, etc.	Flooding	High	Board of Commissioners, Emergency Management, WSACC, Power and Gas Companies, Carolinas	Local	2030	Deferred. Due to growth of county, continual review required because of changes to streams and flow.
PP-6	Evaluate flood or access problems for critical facilities; develop recommendations for protecting critical sites, e.g., law enforcement, EMS, and fire service facilities, and command centers. Identify alternate command posts.	Flooding	High	Emergency Management, Municipalities, Sheriff, EMS	Local	2030	Deferred. Due to growth of county, continual review required because of changes to streams and flow.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
Structural Projects							
SP-1	Debris removal program/problem site corrections.	Flooding	Moderate	Emergency Management	Local	2030, Debris plan reviewed annually.	Deferred. Will review debris plan annually and after major events, formalize use of temporary debris sites with municipalities. Plan reviewed and updated in 2018.
Emergency Services							
ES-1	Evaluate access problems caused by snow or ice for critical facilities; develop recommendations for clearing critical sites, e.g., law enforcement, EMS, and fire service facilities/command centers. Identify alternate command posts.	Severe Winter Weather	High	Emergency Management, County General Services	Local	2030	Deferred facilities evaluation. Will monitor those after each major event, and will evaluate new facilities as they are developed, as new hazards arise.
ES-2	Ensure adequate evacuation time in case of major hazard event, when feasible and county is alerted in a timely manner.	All Hazards	Moderate	Emergency Management, Municipalities, Sheriff	Local	2030	Deferred evaluation, evacuation plans developed and will be reviewed annually and after major events.
ES-3	Evaluate areas with limited evacuation capacity and develop methods for improving evacuation routes and methods.	Flooding	Moderate	Emergency Management, Municipalities, NCDOT	Local	2030	Deferred evaluation, evacuation plans developed and will be reviewed annually and after major events.
ES-4	Continue development of Hazard Warning and Response procedures— warning and evacuation of critical facilities, getting persons out of flood prone or isolated areas, controlling vehicles on evacuation routes, evacuation of hazard materials.	Flooding	High	Emergency Management, Municipalities, Sheriff, NCDOT	Local	2030	Deferred due to growth and changing environmental hazards.
Public Education and Awareness							
PEA-1	Increase public awareness of the effects of winter weather on structures, power lines, trees, and how to prepare for this hazard.	Severe Winter Weather	Moderate	Emergency Management, Red Cross	Local	1-2 years	Deferred. County and EM has social media presence on various platforms to disseminate information.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
PEA-2	Increase public awareness of pending weather events through use of CTY system, media, county website, and local social media sites.	All Hazards	High	Emergency Management, Planning and Development, Communications	Local	2030	Deferred. County and EM has social media presence on various platforms to disseminate information.
PEA-3	Keep citizens informed of changing conditions and behavioral cautions during weather events.	Tornadoes/ Thunderstorms, Hurricane and Coastal Hazards, Severe Winter Weather	High	Emergency Management, Planning and Development, Communications	Local	2030	Deferred. Continue coordination with PIO to push information out to citizens in a timely manner.
PEA-4	Work through Cabarrus Health Alliance to ensure the public is fully informed of and the building permit process incorporates restrictions on providing service within the 100 year floodplain.	Flooding	Moderate	Planning and Development, WSACC	Local	2030	Deferred. Cabarrus Health Alliance is not subject to zoning or building permitting for building lines. Sewer is typically built near the streams and in the floodplain. CHA does not allow septic systems to be permitted in floodplain.
PEA-5	Maintain hazard awareness program materials in office and on website and include links to FEMA and NCEM related resources.	Tornadoes/ Thunderstorms, Hurricane and Coastal Hazards, Severe Winter Weather	Moderate	Emergency Management, Planning and Development, Communications	Local	2030	Deferred. Materials available in various office locations throughout the County as well as informational literature on flooding in the Public Library.
PEA-6	Participate in FEMA, National Weather Service, NCEM, and Ready.gov yearly Awareness Campaigns for Severe Weather, including Flood Safety Awareness week, Lightning Safety Awareness week, and Severe Weather Awareness week.	Tornadoes/ Thunderstorms, Hurricane and Coastal Hazards, Severe Winter Weather	High	Emergency Management, Planning and Development, Communications	Local, State, Federal	2030	Deferred. Publicize information in a timely manner via media, county website, and social media sites and to encourage participation in various activities.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
PEA-7	Establish locations for flood awareness signs. Show elevations of high water in areas that flood; the base flood plus two feet. Signs should be surveyed to serve as elevation reference marks.	Flooding	Low	Planning and Development, Municipalities, Emergency Management, FEMA, DENR, NCDOT	Local	2030	Deferred. Pending Funding. Will work with state agencies to complete sign placement if funding becomes available.
PEA-8	Work with partner agencies to encourage adding gauges in Cabarrus County for the NC FIMAN system. There are currently only 5 in the County. This will help with advanced warning and preparedness in areas prone to flooding.	Flooding Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms	Medium	Emergency Management	Local, County State	2030	This remains a priority for the County. There are now 7 gauges across the County but this will continue to be an area of emphasis.

City of Concord Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Integrate the goals and action items from the Hazard Mitigation Plan into existing regulatory documents and programs where appropriate.	All Hazards	Moderate	All Departments	Local	2030	Mitigation goals and action items continue to be integrated into municipal plans and policies such as the latest revision to the floodplains.
P-2	Continue the role of the City of Concord Emergency Planning Committee in monitoring the process for implementing, monitoring, and evaluating citywide mitigation activities.	All Hazards	Moderate	Emergency Management	Local	2030	The Concord Incident Management Team has been established with representation from several City Departments. The City's Staff Leadership Team, consisting of Department Directors assists in reviewing emergency plans and providing suggestions.
P-3	Develop public and private partnerships to foster natural hazard mitigation program and collaboration in the City of Concord.	All Hazards	Moderate	Emergency Management	Local	2030	The Recognized Neighborhood program continues to grow with additional neighborhoods. EM continues to participate in national/state programs such as National Preparedness Month, Cyber Security Month, and Severe Weather awareness month.
P-4	Develop inventories of at-risk buildings and infrastructure and prioritize mitigation projects.	All Hazards	High	Emergency Management, Building and Grounds	Local	2030	The recent FEMA revision to the floodplain has incorporated the Old South Area. Inventories of at-risk structures are identified through the flood plain mapping and is available.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
P-5	Drainage basin master planning to establish system capacities, flood vulnerability, and establish CIP needs.	Flooding	High	Stormwater	Local, Stormwater fees	Annually	Basins have been studied to include specific areas of interest for detailed modeling.
P-6	Review all development codes and ordinances to ensure that they include appropriate flood and natural hazard mitigation strategies.	All Hazards	Moderate	Business and Neighborhoods, Code Enforcement, Police	N/A	Annually	Recommend keeping this item in progress to address future changes in flood and mitigation strategies are appropriately incorporated into development codes and ordinances.
P-7	Provide disaster preparedness training for city employees.	All Hazards	Moderate	Emergency Management	Department of Fire and Life Safety, Department of Justice, FEMA, DHS, Citizen Corps, CERT	Annually	This has been implemented with various classes, assessments and exercises given to and incorporating all city departments. Continuing preparedness training is important to meet the ever changing risk environment and we recommend keeping this as an in progress action.
P-8	Conduct Emergency and Disaster Drills and Exercises for Departments.	All Hazards	Moderate	Emergency Management	Department of Justice, FEMA, DHS	Annually	Emergency Management continues to conduct several emergency preparedness drills, annually for City departments, to include tabletop and full-scale exercise scenarios.
Property Protection							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PP-1	Conduct annual risk assessment of critical facilities.	All Hazards	High	Emergency Management, Fire	Local	Annually	City risk assessments are conducted on Critical Infrastructure by Emergency Management for various facilities in the city including the electrical and water infrastructure. The fire department conducts inspections of schools and each school is evaluated in March for the Statewide tornado drill.
PP-2	Identify structures in new floodplain area (based on mapping above) and initiate mitigation efforts for repetitive loss.	Flooding	High	Emergency Management, Planning and Neighborhood Development, Stormwater	Local	Annually	Structures newly mapped in were contacted and provided info on mitigation options available to them.
PP-3	Evaluate the feasibility of acquisition or elevation of flood prone structures.	Flooding	High	Stormwater, Emergency Management, Water Resources	BRIC, HMGP, FMA, CDBG, NFIP ICC	Annually	Discussions have taken place but no final determination has been made.
Natural Resource Protection							
NRP-1	Use technical knowledge of natural hazards and events to link natural resource management and land use organizations to mitigation activities and technical assistance.	All Hazards	Moderate	Planning and Neighborhood Development,	Planning and Neighborhood Development, NOAA, FMA, HMGP, PDM	2030	New Greenway areas continue to be identified and developed. The city has implemented the NWS "Turn-Around-Don't Drown program to raise awareness of flood prone transportation infrastructure.
Structural Projects							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
SP-1	Develop a plan to identify and address cleaning of problematic street drainage sites, including the creation of an emergency response team.	Flooding	High	Stormwater	Local, Stormwater Services	Annually	Proactive maintenance to include continuous pre and post storm inspections.
Emergency Services							
ES-1	Maintain resources to adequately control traffic such as barricades, barriers, cones, and signs.	All Hazards	Moderate	Transportation Fire PD	Transportation	Annually	Completed. Additional road barriers have been purchased to assist with traffic control, in addition to the equipment that was already in place. This action will remain in the plan to help maintain vigilance.
ES-2	Develop Emergency Operations Plans for dams.	Flooding	Moderate	Water Res. EM WSAAC	Local	As needed	Lake Fisher EAP was revised in 2022. This action will remain in the plan to help maintain vigilance.
ES-3	Develop evacuation and detour routes.	All Hazards	High	Trans PD Fire	N/A	2030	Concord is in the process of developing an evacuation annex though not specific to floods. The annex identifies the concept of operation and responsibilities for any evacuation. Four site specific routes are being developed for the downtown area, Carolina Mall, Concord Mills Mall, and Charlotte Motor Speedway.
ES-4	Equip Concord Fire and Life Safety for flood emergencies including swift water rescue.	Flooding	Moderate	Fire	HMGP, Firefighter grants	2030	Concord Fire Department has developed and implemented a swift water rescue team. A listing of the available swift water rescue resources including barricades are maintained in Emergency Management.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
ES-6	Develop automated flood warning system to include forecasting and warning.	Flooding	High	Storm Water Transportation EM Engineering	Stormwater Services, NOAA, FMA, HGMP, PDM	2030	Additional river gauges were being investigated by Cabarrus County.
ES-7	Suggest implementing a program to identify local stream by signs located on bridges. This will assist in rescue situations and identifying run-off from hazardous material spills that have entered the water-way.	Flooding, Hazardous Substances	High	EM Transportation Fire	EM Transportation Storm Water	2030	All stream crossings are identified on the same sign post as the Adopt-A-Stream signs.
Public Education and Awareness							
PEA-1	Identify, improve, and sustain collaborative programs focusing on disaster education for public and private sector organizations and individuals to avoid activity that increases risk to natural hazards.	All Hazards	High	EM	Local	2030	Community education continues with the Concord 101 and Public Safety Academy programs. This action will remain in the plan to help maintain vigilance.
PEA-2	Implement spring public information campaign aimed at tornado, flood, and severe weather awareness to include information on safe rooms.	Flooding, Tornadoes/ Thunderstorms	High	EM	Local, Stormwater Services, Emergency Management, Planning	Annually	Concord EM annually shares information to the public, contributing to the “Severe Weather Preparedness Week” campaign. This action will remain in the plan to help maintain vigilance.
PEA-3	Evaluate “Turn around, don’t drown” warning program.	Flooding	High	Transportation	Local, Transportation	1 Year	Advanced “flip-down” flood warning signs are installed at flood prone locations, and are opened during a flooding event to provide real-time feedback. This action will remain in the plan to help maintain vigilance.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-4	Strengthen emergency services preparedness and response by linking emergency services with hazard mitigation programs, enhancing public education on a citywide scale.	All Hazards	Moderate	Fire PD Storm Water EM	Local, Stormwater, Planning, FMA, HMGP	2030	Continue to monitor each flood event and identify any areas outside of the mapped flood plain. Recommend maintaining this program as in progress in order to identify potential new risk areas.
PEA-5	Develop public information and alerting system for dam failure based on plans.	Flooding	High	Water Res. PIO EM	Local	Annually	Everbridge is utilized to alert citizens of hazards in a particular area, however it is an opt-in service that residents must register for. Reverse 911 capabilities are also an option for areas that are impacted.
PEA-6	Continue emergency notification system (Connect CTY) to notify citizens of hazards and emergencies	All Hazards	Moderate	PIO	Local	Annually	Consideration of maintaining this as a new system is currently being considered in the area.
PEA-7	Improve the dissemination of hazard information, including maps, broadcasts, websites, list serves, and blogs.	All Hazards	Moderate	EM PIO	FEMA, ARC, Concord 101 and Public Safety Academy	2030	During Hurricanes Florence and Michael, social media was successfully used to disseminate information about the developing situation, including tracking charts and weather forecasts. During the event, status reports were provided to keep the community aware of the local impact and provide incident specific safety information such as detours.

Town of Harrisburg Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
P-3	In conjunction with Cabarrus County Planning and Development Department, review/update flood damage prevention ordinance to ensure maximum protection from flood hazard events.	Flooding	High	Town Council	Local	The ordinance will remain as it is until changes occur at state or federal level and/or county is advised to change.	Town Ordinance is in compliance with State/Federal requirements, Flood Plain Ordinance was recently changed to reflect the new FIRM maps that went to effect on November 2018.
P-5	Continue participation in the Community Rating System.	Flooding	Moderate	Town Council	Local	2030	The Town is looking into the CRS requirements and possibly participating in the Program.
P-6	Review Town's zoning plan. As needed, adopt zoning in floodplain areas to better control future development in these areas.	Flooding	High	Town Council, Planning and Zoning	Local	Annually	The Town updated its Land Use Plan and adopted in June of 2018, the plan identifies areas that needs to be protected. Town will updated its Unified Development Ordinance (UDO) in 2019 and completed the update in 2020. Floodplain requirements were revisited as part of UDO update.
P-7	Update Small Area Plans. Delineate preferred growth areas and develop area plans for target locations.	Flooding	High	Town Council, Planning and Zoning Board	Local	Annually	The Town's Land Use Plan (HALUP) illustrates the growth vision and preferred land use throughout the town. Moorehead Area Small Area Plan was completed in 2018 which was folded into the Harrisburg Area Land Use Plan (HALUP) update. HALUP also identifies few focus areas for growth and outlines growth vision and strategy.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
P-9	Participate in the review of the county hazard mitigation plan. Ensure that all hazards and mitigation efforts for Harrisburg are addressed within the plan.	Flooding	Moderate	Town Council	Local	Annually	The Town participated in the development of the regional hazard mitigation plan in the past and will continue its participation in the County's Hazard Mitigation Planning Process.
P-10	Monitor hazard mitigation plan implementation to ensure schedules met.	All Hazards	Moderate	Town Council	Local	Annually	The Town continues to monitor its mitigation action plans and update as needed. Industrial sites hazard mitigation/prevention visits are made by Fire Safety Personnel periodically to ensure these industries have plans in place in case of emergency.
P-11	Coordinate with County Planning and Development Department in tracking repetitive loss in Harrisburg and Cabarrus County	Flooding	Moderate	Town Council	Local	2030	Deferred. The Town continues to work on developing mitigation strategies for these properties. This action will be revisited during the 2030 update of the hazard mitigation plan.
Property Protection							
PP-5	Develop an open space plan, target properties for acquisition and fund acquisition program.	Flooding	Moderate	Town Council, Planning and Zoning Board	State	As funds are available,	The Town's recently adopted Land Use Plan and the UDO emphasizes Open Space requirements as part of any new development, such requirements are outlined in the UDO for different land uses. Town reviews the opportunity of acquiring frequently flooded properties and determines actions on a case-by-case basis.
PP-6	Coordinate with Cabarrus County to establish list of priority properties and secure a funding source for acquisition in the event of a future natural disaster.	Flooding	Moderate	Town Council, Planning and Zoning Board	Federal, State, Local	Annually	The Town is continuing outreach to these property owners to offer assistance as needed.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PP-7	Establish program for evaluation and improvement of critical services (public and private) water, sewer, electricity, etc.- and critical facilities- fire, rescue, medical, etc.	Flooding	Low	Town Council, Harrisburg Fire Department, Harrisburg Emergency Coordinator, Harrisburg Public Works	Local	2030	The Town completed the Construction of Fire Station 3 in 2015 and Fire Station 2 construction was completed in June 2019. This helps ensure critical services are provided. Town also constructed a new (2nd in Town) water tower in 2019 which helps ensure required level of water need to provide fire services.
PP-8	Evaluate flood or access problems for critical facilities; develop recommendations for protecting critical sites, e.g., law enforcement, EMS, and fire service facilities, and the town hall. Identify alternate locations to direct response operations.	Flooding	Moderate	Town Council, Harrisburg Fire Department	Local	2030	A plan was developed in 2019. It is reviewed and revised as needed. This action will remain in the plan to help maintain vigilance.
Emergency Services							
ES-1	Evaluate access problems caused by snow or ice for critical facilities; develop recommendations for clearing critical sites, e.g. law enforcement, EMS, and fire service facilities and the town hall. Identify alternate sites to control response operations.	Severe Winter Weather	High	Harrisburg Fire Department	Local	Annually	Access plan is in place. Town's Public Works crew assist the Fire Department to clear sites for access. This action will remain in the plan to help maintain vigilance.
ES-2	Determine if there are any areas with limited evacuation capacity and develop methods for improving early warning and evacuation routes and methods.	Flooding	Moderate	Harrisburg Fire Department, Town Council	Local	2030	The Town's Fire Department has several monitors installed on streams, more added as needed. Early warning and evacuation messages are released through town media personnel, social media and websites.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
ES-3	Evaluate early warning and response action. In the event of flooding, how will critical facilities be evacuated; how will the town government react to get persons out of flood-prone or isolated areas; how will vehicles on evacuation routes be controlled; and how will hazards materials be protected or evacuated.	Flooding	High	Town Council, Harrisburg Fire Department, Harrisburg Emergency Coordinator	Local	2030	The Town utilizes tools such as Everbridge Mass Communication System and Reverse 911 system. Fire Department assist with response action for government and critical facilities, Sherriff's office maintains and control evacuation routes and Public Work staff monitors Pump Stations.
Public Education and Awareness							
PEA-1	Maintain current Early Warning System/Dissemination of information alerting town residents when to seek shelter when high winds or other hazards are expected.	All Hazards	Moderate	Town Council	Local	1-2 years	Town's IT system is upgraded to allow us to work remotely in case of emergency. The Everbridge Communication system, Fire Safety Education, Social Media and Town website are some of the tools utilized for early warning information dissemination.
PEA-2	Increase public awareness of the effects of winter weather on structures, power lines, trees, and how to prepare for this hazard.	Severe Winter Weather	Moderate	Town Council, Harrisburg Fire Department	Local	1-2 years	Town's IT system is upgraded to allow us to work remotely in case of emergency. The Everbridge Communication system, Fire Safety Education, Social Media and Town website are some of the tools utilized for early warning information dissemination.
PEA-6	Establish locations for flood awareness signs, specifically where high risk flood areas intersect with public roadways.	Flooding	Low	Town Council	Local	2030	The Town's Public Works crew will identify and install signs at high risk flood areas.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-7	Increase public awareness of pending weather events through use of CTY system, media, county website, and local social media sites.	All Hazards	High	Emergency Management, Planning and Development, Communications	Local	2030	The Town's Communication Manager and Fire Dept. PIO work hand-in hand to ensure public is receiving accurate and timely information on weather events. Town's website and social media tools are utilized on a daily basis. Town Departments have plan in place for Emergency Evacuation and Town will soon embark on creating a Town wide Emergency Management Plan.

City of Kannapolis Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Maintain stormwater management program as part of required NPDES Phase 2 permitting.	Flooding	High	Public Works, Planning	Local	2030	This program is being implemented in conjunction w/ Woolpert Inc. & City Stormwater Maint. Staff
P-2	Preserve emergency water supply through existing planning process and agreements.	All Hazards	High	City Manager	Local	2030	Continue preservation efforts through planning and agreements. Revisit action during 2030 plan update.
P-3	Maintain comprehensive policy regarding drought management and response as part of local water supply planning process.	Drought	Moderate	City Manager, Public Works	Local	2030	Continue to review and revise drought management and response policy as needed. Revisit action during 2030 plan update.
P-4	Maintain current floodplain regulation standards.	Flooding	Moderate	Public Works, Planning	Local	2030	This is implemented through the plan review & approval process. This action will remain in the plan to help maintain vigilance.
P-5	Restrict new construction to outside the 100 year flood area of a minimum 100 feet from the top of bank from perennial streams, whichever is greater.	Flooding	Moderate	Public Works, Planning	Local	2030	UDO re-write currently in progress. Action will be revisited during 2030 update.
Property Protection							
PP-1	Maintain maps of mobile home parks as part of planning activities.	All Hazards	High	Planning, Public Works	Local	2030	This is implemented through the Planning and Public Works Departments. This action will remain in the plan to help maintain vigilance.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PP-2	Identify emergency shelters in Kannapolis.	All Hazards	High	Planning, Public works, Fire, Police	Local	2030	This is implemented through the Planning, Public Works, Fire and Police Departments. This action will remain in the plan to help maintain vigilance.
PP-3	Identify properties that can be utilized as temporary storage sites for debris.	All Hazards	High	Public Works, Planning	Public Works	2030	This is implemented through the Planning and Public Works Departments. This action will remain in the plan to help maintain vigilance.
PP-4	Establish on call contract agreements with qualified contractors for collection and removal of debris on affected areas.	All Hazards	High	Public Works	Public Works	2030	This is implemented through the Public Works Department. This action will remain in the plan to help maintain vigilance.
PP-5	Maintain program for clearing debris from culverts and storm drains in priority areas as part of NPDES Phase 2 stormwater control standards.	Flooding	Moderate	Public Works	Publics Works	2030	This is implemented by City Stormwater Maintenance staff. This action will remain in the plan to help maintain vigilance.
PP-6	Maintain maps of properties in floodplain as part of planning activities.	Flooding	High	Planning, Public Works	Local, State	2030	This is implemented through the Planning and Public Works Departments. This action will remain in the plan to help maintain vigilance.
Natural Resource Protection							
NRP-1	Use comprehensive planning process to identify and preserve environmentally sensitive areas, such as natural wetlands, conservation areas, streams, lakes, other water bodies, etc.	All Hazards	Moderate	Public Works, Planning	Local	2030	This is implemented through the Planning and Public Works Departments through zoning and future land use map. This action will remain in the plan to help maintain vigilance.
Structural Projects							
SP-1	Improve drainage of flood prone roadways that cross streams.	Flooding	Moderate	Public Works	Public Works	2030	This is implemented by City Stormwater Maintenance staff. This action will remain in the plan to help maintain vigilance.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Emergency Services							
ES-1	Create a mobilization plan for response to an emergency.	All Hazards	High	Emergency Management, All City Departments	Local	2030	This is implemented through all City Departments. This action will remain in the plan to help maintain vigilance.
ES-2	Identify and map critical facilities within Kannapolis. Enter this information into CAD for all emergency responders.	All Hazards	High	Emergency Management, Fire, Planning	Local	2030	This is implemented through the use of GIS. This action will remain in the plan to help maintain vigilance.
ES-3	Fully assess vulnerability of each identified critical facility to natural hazards.	All Hazards	Moderate	Emergency Management, Fire, Police, Planning	Local	2030	This will be implemented through Emergency Management, Fire, Police and Planning Departments. This action will remain in the plan to help maintain vigilance.
ES-4	Provide stand by emergency generators with transfer switch and a 72 hour fuel capacity at all existing city owned critical facilities.	All Hazards	Moderate	Emergency Management, Fire	CIP, Grants	2030	Updated. Would need to be planned and budgeted accordingly.
ES-5	Provide stand by emergency generators with transfer with transfer switch and a 72 hour fuel capacity at any new city owned critical facility constructed, remodeled, or reconstructed.	All Hazards	Moderate	Emergency Management, New Facility Director	CIP	2030	Updated. Shall be included in project construction fund.
ES-6	Establish predefined street detour plans and disbursement of MUTCD measures in response to a major emergency or disaster.	All Hazards	Moderate	Public Works, Police, Fire, Planning, Engineering	General Fund, CIP	2030	This action is deferred Pending staff time and funding. Action will be revisited in 2030.
Public Education and Awareness							
PEA-3	Clean up streams as part of Kannapolis Kares Day and volunteer stream cleanups.	Flooding	Moderate	Public Works	Public Works	Annually	We coordinate this with the NCDOT. This action will remain in the plan to help maintain vigilance.
PEA-4	Use social media to educate citizens on environmental issues.	Flooding	Moderate	Public Works	Local	Annually	Specific environmental posts are placed on all social media outlets including Instagram, Facebook, Twitter monthly.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-5	Use Kannapolis Matters newsletter to educate citizens on environmental issues.	Flooding	Moderate	Public Works	Local	Annually	Specific environmental posts are placed in the newsletter monthly. We also use the e-mail newsletter to disperse this information.

Town of Midland Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-5	Continue participation in the Community Rating System.	Flooding	Moderate	Town Council	Local	2030	Action deferred. The Town does not participate in the CRS. Town staff will need to determine whether or not it is feasible to participate in the program. There are only 2 NFIP policies currently in place in the Town.
P-6	Review Town's zoning plan. As needed, adopt zoning in floodplain areas to better control future development in these areas.	Flooding	High	Town Council, Planning and Zoning Commission	Local	2030	Updated. The Town has been reviewing the zoning plan as needed. The Town's flood damage prevention ordinance regulates development in the floodplain within the municipal limits. The County's flood damage prevention ordinance regulates development in the unincorporated areas.
P-7	Update Small Area Plans. Delineate preferred growth areas and develop area plans for target locations.	Flooding	High	Town Council, Planning and Zoning Commission	Local	2030	Updated, the Town has been reviewed and updated its Future Land Use Map, October 2016. The County's flood damage prevention ordinance regulates development in the floodplain in the unincorporated area of the County. This action will remain in the plan to help maintain vigilance.
P-9	Participate in the review of the county hazard mitigation plan. Ensure that all hazards and mitigation efforts for Midland are addressed within the plan.	Flooding	Moderate	Town Council	Local	2030	The Town plans to participate in the 2030 plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
P-10	Monitor hazard mitigation plan implementation to ensure schedules met.	All Hazards	Moderate	Town Council	Local	2030	The Town will help monitor the implementation of the hazard mitigation plan and will help ensure that mitigation actions for the Town are implemented according to schedule or will provide updates on actions to determine impediments towards implementation.
P-11	Assist County Planning and Development Department in tracking benefits in flood loss reduction.	Flooding	Moderate	Town Council	Local	2030	There are no repetitive loss properties in Midland. This action will be revisited during the 2030 hazard mitigation plan update.
P-12	Consider adopting temporary moratorium on new construction and new subdivisions within flood hazard area until Flood Damage Prevention has been updated.	Flooding	Low	Town Council	Local	The ordinance will remain as it is until changes occur at state or federal level and/or county is advised to change.	As of 2025, no moratorium has been adopted. In November 2018 the Town adopted the updated Flood Damage Prevention Ordinance recommended by the State.
Property Protection							
PP-5	Develop an open space plan, target properties for acquisition and fund acquisition program.	Flooding	Moderate	Town Council, Planning and Zoning	State	As funds are available.	As of 2025, an open space plan has not been developed due to limited funding and staff time. This action will be reviewed during the 2030 update.
PP-6	Coordinate with Cabarrus County to establish list of priority properties and secure a funding source for acquisition in the event of a future natural disaster.	Flooding	Moderate	Town Council, Planning and Zoning	Federal, State, Local	2030	Properties have been identified, will monitor events and update list as applicable.
PP-7	Establish program for evaluation and improvement of critical services (public and private) water, sewer, electricity, etc.- and critical facilities- fire, rescue, medical, etc.	Flooding	Low	Town Council, Midland Volunteer Fire Department	Local	2030	This action will be revisited during the 2030 update of the hazard mitigation plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PP-8	Evaluate flood or access problems for critical facilities; develop recommendations for protecting critical sites, e.g., law enforcement, EMS, and fire service facilities, and the town hall. Identify alternate locations to direct response operations.	Flooding	Moderate	Town Council, Midland Volunteer Fire Department	Local	2030	This action will be revisited during the 2030 update of the hazard mitigation plan.
Emergency Services							
ES-1	Evaluate access problems caused by snow or ice for critical facilities; develop recommendations for clearing critical sites, e.g. law enforcement, EMS, and fire service facilities and the town hall. Identify alternate sites to control response operations.	Severe Winter Weather	High	Midland Volunteer Fire Department	Local	Annually	In progress. Current facilities have been evaluated, will monitor those after each major event, and will evaluate new facilities as they are developed.
ES-2	Determine if there are any areas with limited evacuation capacity and develop methods for improving early warning and evacuation routes and methods.	Flooding	Moderate	Midland Volunteer Fire Department , Town Council	Local	2030	Will continue to evaluate alerts and warnings and push out information and notices as soon as possible.
ES3	Evaluate early warning and response action. In the event of flooding, how will critical facilities be evacuated; how will the town government react to get persons out of flood-prone or isolated areas; how will vehicles on evacuation routes be controlled; and how will hazards materials be protected or evacuated.	Flooding	High	Town Council, Midland Volunteer Fire Department	Local	2030	WEA and IPAWS will enhance notification for evaluation.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Public Education and Awareness							
PEA-1	Maintain current Early Warning System/Dissemination of information alerting town residents when to seek shelter when high winds or other hazards are expected.	All Hazards	Moderate	Town Council	Local	2030	Deferred pending funding and staff time.
PEA-2	Increase public awareness of the effects of winter weather on structures, power lines, trees, and how to prepare for this hazard.	Severe Winter Weather	Moderate	Town Council, Midland Volunteer Fire Department	Local	2030	Deferred pending funding and staff time.
PEA-6	Establish locations for flood awareness signs. Show elevations of high water in areas that flood, the base flood and the base flood plus two feet. Signs should be surveyed to serve as elevation reference marks.	Flooding	Low	Town Council	Local	2030	Action deferred pending funding. Will work with state agencies to complete sign placement if funding becomes available.
PEA-7	Increase public awareness of pending weather events through use of CTY system, media, county website, and local social media sites.	All Hazards	High	Emergency Management, Planning and Development, Communications	Local	2030	Coordinate with PIO and Town Manager to push information out to citizens in a timely manner.

Town of Mount Pleasant Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
Prevention							
P-2	Continue participation in the Community Rating System.	Flooding	Moderate	Town Staff, Consultant, Board of Commissioners, Town Planning and Zoning Board	Local	2030	Deferred: Currently Cabarrus County participates in the program with a Class 7 which provides a 15% discount for those with Flood Insurance Policies while Concord has a class 7 providing a 15% discount. Mount Pleasant was unaware of the program and was not participating. Upon review, determined that Mount Pleasant does not participate though it is a participant in the Flood Plain Management Program. This is a voluntary incentive program that recognizes and encourages community floodplain management practices that exceed the minimum requirements of the NFIP. Based on the 2020 status, the Town has standards that exceeded the program but was not aware of the program, its benefits, and verified as not being a participant. The Town has limited structures located within the identified flood plain (<10). Staffing to maintain a program is limited with the current "Flood Plain Manager" being the Planning and Economic Development Director also serving as the Assistant Town Manager with very broad position responsibilities. Evaluate the feasibility of participation in the program.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
P-5	Establish reserve fund for relocating damaged infrastructure after a natural disaster.	All Hazards	Low	Board of Commissioners	Local	2030	Action to be deleted: The Town does not have sufficient revenue to maintain a reserve fund for relocating damaged infrastructure in the event of a natural disaster. The town would utilize the general fund and/or water and sewer fund for relocating damaged infrastructure in the event of a natural disaster and define this in the Town Policies and/or budget. The Rebuild NC program is not applicable to the community as it is not located in a designated buyout zone.
P-7	Participate in the review of the county hazard mitigation plan. Ensure that all hazards and mitigation efforts for Mount Pleasant are addressed within the plan.	All Hazards	High	Emergency Planner/Assistant Town Manager/Town Manager	Local	2030	In 2024 the Town hired a part time emergency planner/code compliance officer who participates in the emergency planning, response, mitigation and recovery for the Town. The current plan is being reviewed for accuracy and status of the Town's listed goals. Goals which have no history of compliance are being removed and new goals evaluated regarding cost and benefits.
P-8	Monitor hazard mitigation plan implementation to ensure schedules met.	All Hazards	Moderate	Town Staff	Local	2030	The Town maintains a complete copy of the adopted plan in addition a copy of the plan is available on the Cabarrus County's Emergency Management Web page.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
P-9	Improve storm water infrastructure based on an Infrastructure Assessment for Storm Water Vulnerability including possible culvert upgrades and monitoring of vulnerable infrastructure.	Flooding	High	Public Works	Local, State Grants, Federal Grants	2025-2030	New action for the 2025 Update: The Town's original storm water system is being overcome by the severity of recent storms. Urban flooding is occurring in places not commonly effected by storm water run-off. NCDOT has implemented several storm water improvements to assist in alleviating the problem. A storm water study has been conducted in the downtown area and the Town will continue to seek funding to address re-occurring urban flooding. An Asset Inventory and Assessment is also being conducted by LKC Engineering.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
P-10	Develop a Town Debris Management Plan	All Hazards	High	Public Works/Emergency Planner	Local	2025-2026	The Town does not have a written document that establishes its procedures and guidelines for managing debris in a coordinated, environmentally responsible, and cost-effective manner. Insufficient debris management planning can devastate municipalities' available funds. Having a limited staff, shortfalls in managing debris in an effective and efficient manner with the resources available is essential. A plan will also identify resource shortfalls which can be addressed through mutual aid and contracts. Not only is cost a concern, but the amount of debris can complicate and delay disaster response activities when the community needs it and delay the recovery effort.
Property Protection							

PP-4	Develop an open space plan, target properties for acquisition and fund acquisition program.	Flooding	Moderate	Town Staff, Consultant, Board of Commissioners, Town Planning and Zoning Board	Local	Completed/To be continued	The current plan was adopted in December of 2017 and updated on March 23, 2020. A copy of the plan is posted on the Town's Website and retained in the Town Hall. Typically, these type plans are updated at a minimum of every 5 years. The Town will be updating its Comprehensive Plan beginning in 2024. https://www.mtpleasantnc.org/wp-content/uploads/MP-Adopted-Comprehensive-Plan-As-Amended-3-23-20-Reduced.pdf LU5, page 4.6 Encourages the preservation of open space, forestland, and farmland with minimum open space requirements and conservation development options for residential development as a high priority. Most of the Town's flood hazard areas are in the ETJ comprising 916 acres or 7.22% of the planning area. Within the Town, flood hazard areas comprise 109.13 acres or 5.34% of the Town's area. The plan does not target properties for acquisition and contains no mention of an acquisition program. No map or table identifying flood prone structures were in the plan. The Town will incorporate identification of flood prone structures by documentation of annual response and other emergency management documents such as the Emergency Action Plan and the Black Run Creek Dam Plan's Inundation Study. This will also capture flooding outside of the identified floodplain such as urban flooding from storm water run-off. As of this review, only one residential structure is located within the identified special flood hazard area, (7220 Empire Drive, Mount Pleasant, NC 28124).

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
PP-5	Coordinate with Cabarrus County to establish list of priority properties and secure a funding source for acquisition in the event of a future natural disaster.	Flooding	Low	Town Staff, Town Board of Commissioners	Federal, State, Local	2030	No funding source is designated to support an acquisition program. In 2024, the Town began monitoring impacts of natural hazards to identify areas impacted and evaluate mitigation strategies. As an example, heavy rain has resulted in urban flooding during several storm events. The damage was documented, work orders established and monitored, and response documented to establish a baseline for future events. Continue to work with Cabarrus County Emergency Management to determine if an acquisition program is available. Evaluate the possibility of participation the North Carolina Land and Water Fund.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
PP-6	Establish program for evaluation and improvement of critical services (public and private) water, sewer, electricity, etc.- and critical facilities- fire, rescue, medical, etc.	Flooding	Medium	Town Staff, Mount Pleasant Fire Department, Town Board of Commissioners	Local	2025/2026	Since the 2020 status, the Mount Pleasant Fire Department improved its ISO rating within the Town Limits from a 4 to a 2 and in the rural from a 5 to a 4. The Town has also identified transportation, water and sewer infrastructure strategies and is in the process of upgrading the water and portions of the sewer system. During the upcoming mitigation cycle, the Town plans on conducting a vulnerability and risk assessment of all municipal facilities. Results will be documented and a work plan established to address deficiencies in the upcoming 5-year mitigation cycle.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
PP-7	Evaluate flood or access problems for critical facilities; develop recommendations for protecting critical sites, e.g., law enforcement, EMS, and fire service facilities, and the town hall. Identify alternate locations to direct response operations.	Flooding	High	Town Board of Commissioners, Town Staff, Mount Pleasant Fire Department, Emergency Planner	Local	2030	The damage of the Dutch Buffalo Creek Dam was addressed through a FEMA grant and repairs implemented. The age of this dam and the susceptibility to damage in the event of a breach of the Black Run Creek Reservoir is significant to maintain this as a high priority. Though no other critical facilities are at risk from riverine flooding, urban flooding has become an issue in the town and is being evaluated through documents of natural hazard impacts. The Town will continue to explore funding opportunities to retrofit. Improve or replace the Dutch Buffalo Creek Dam. The Town will also evaluate the risk identified in the forthcoming inundation study for the Black Run Creek Dam.
Emergency Services							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
ES-1	Evaluate access problems caused by snow or ice for critical facilities; develop recommendations for clearing critical sites, e.g. law enforcement, EMS, and fire service facilities and the town hall. Identify alternate sites to control response operations.	Severe Winter Weather	High	Town Staff, Mount Pleasant Fire Department, Emergency Planner	Local	Partially completed/To be continued	Conduct emergency planning for snow/ice removal and debris removal, prioritizing critical infrastructure. Implement emergency planning to allow the Town to address any deficiencies in its disaster response until mutual aid can be requested and arrives on site. Develop a document of available town resources to include current FEMA Classifications and Rates. Utilize this information in developing a response plan and to develop any mutual aid agreements to address shortfalls. This will be covered in a new mitigation measure.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
ES-2	Determine if there are any areas with limited evacuation capacity and develop methods for improving early warning and evacuation routes and methods.	Flooding	Moderate	Town Staff, Mount Pleasant Fire Department , Town Board of Commissioners	Local	Completed/To be continued	No areas have been identified with limited evacuation capacity. Currently, no local system is in place to monitor the local natural water system for flooding. Warnings in the community are primarily received via NOAA alert systems such as NOAA Radios, phone apps and radio/television. Only the Town Hall facility has a national weather service radio. The Town will evaluate the results of the inundation study of the Black Run Creek Dam to identify if any potential flood areas result impacts to evacuation routes. New construction will continue to be monitored to prevent critical facility construction in flood prone areas. The current flood risk is along the rear of the properties in the Oldenburg community adjoining Dutch Buffalo Creek and does not impact the transportation system. The Town will continue to evaluate any changes in flood mapping or new flood events.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
ES-3	Evaluate early warning and response action. In the event of flooding, how will critical facilities be evacuated; how will the town government react to get persons out of flood-prone or isolated areas; how will vehicles on evacuation routes be controlled; and how will hazards materials be protected or evacuated.	Flooding	High	Town Staff, Town Board of Commissioners, Mount Pleasant Fire Department, Town Emergency Planner	Local	Completed/To be continued	The description was incomplete in the original documentation. No critical facilities are located within any of the community's flood plains that would require evacuation. Early warnings are primarily received through NOAA weather radio, tv/radio, and computer or phone apps. Also, the County-wide alert system policy and access for local municipalities will be requested. Flood events and mapping will continue to be monitored. During 2025 a Hazard Specific Flood Plan will be incorporated into the Town's Emergency Operations Plan.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
ES-4	Revise the EAP for the Black Run Creek Dam and evaluate the risks associated with the inundation study.	Dam Failure	High	Emergency Planner, Water Resources, Town Engineer	Local	2025/2026	New action for the 2025 Plan: The current plan for the Black Run Creek Dam was developed by the Water and Sewer Authority in 2005 and the data revised in 2016 before the Town acquired ownership of the dam. An EAP is required to be updated and resubmitted annually by the North Carolina Department of Environmental Quality (DEQ). A plan has been drafted but is currently waiting on an inundation study by a certified engineer. A Dam failure plan is required by NCDEQ. Due to the number of years which have passed since the last revision and the changing demographics of the community, the revision of the EAP is a priority of the Town. The inundation study will be used to conduct a risk assessment of the flooding potential associated with a dam breach. Properties identified in the study will be notified of the risk and their contact information provided to Cabarrus County for their notification system.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2025)
ES-5	Conduct a multi-agency tabletop exercise for a failure of the Black Run Creek Dam	Dam Failure	High	Emergency Planner	Local	2025 – pending approval of the Black Run Creek Dam Failure Plan by NCDEQ	New Action for the 2025 plan: No previous exercise has been conducted for the dam. Pre-event exercises better prepare organizations, teams, and personnel to respond more effectively and efficiently to an emergency at the dam. An owner of a high hazard is required to perform a tabletop exercise at least every five (5) years. The tabletop exercise will include Town Staff and local emergency responders in a conference room setting. No evidence of any previous exercises is available. The exercise with follow the Homeland Security Exerciser and Evaluation Program (HSEEP) guidelines.
ES-6	Seek funding to install back-up generators or quick hook ups for mobile generators on existing and future Town Facilities essential to operation of basic governmental functions. An emergency generator will be able to automatically supply illumination and other building systems essential to maintain operations.	All Hazards	High	Town Manager/ Assistant Town Manager/ Emergency Planner	Local – Costs will be determined on a case-by-case- basis	2025-2030	Currently only the Mount Pleasant Fire Department has an emergency generator. Plans are in for an emergency generator at Town Hall. The importance of emergency power in keeping critical facilities operational during and after a major natural disaster is essential for continuation of operations.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Public Education and Awareness							
PEA-1	Maintain current Early Warning System/Dissemination of information alerting town residents when to seek shelter when high winds or other hazards are expected.	All Hazards	Moderate	Town Staff	Local	2030	Recommend deletion of this measure as the Town does not own nor maintain its own EWS. The Town does not have its own early warning system and relies on public systems such as NWS weather radios, mobile phone apps, television and radio.
PEA-2	Increase public awareness of the effects of winter weather on structures, power lines, trees, and how to prepare for this hazard.	Severe Winter Weather	Moderate	Town Staff, Mount Pleasant Fire Department	Local	2030	This measure is intended to increase public education though the previous status centers on notification of the public through a mass communications system not on increasing public awareness of how to receive weather warnings or prepare for the hazard. The Town will implement a Severe Weather Public Education program to include Severe Winter Weathers utilizing periodic, seasonal public education on the effects of seasonal severe weather as requested by the community. Social media, inserts in billings, and public education program will also be used to increase public awareness not just for winter weather but all natural hazards.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-6	Establish locations for flood awareness signs. Show elevations of high water in areas that flood, the base flood and the base flood plus two feet. Signs should be surveyed to serve as elevation reference marks.	Flooding	Moderate	Town Staff, Town Board of Commissioner sl, NCDOT	State, Local	Delete	Recommend deletion of this measure. NCDOT has installed "Road Subject to Flooding" in the Town's ETJ. No streets within the Town limits are within a flood plain. This measure can be maintained as Partially Completed/In Progress since the Dam Inundation Study is not complete or in the event of future flood incidents. This could also include participation in the NWS "Turn Around Don't Drown" Program, though the roads subject to flooding are within NCDOT's and Cabarrus County's jurisdictions.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-7	Increase public awareness of the means of receiving pending weather events through public outreach and education.	All Hazards	High	Emergency Management, Town Staff	Local	2030	Social media can communicate in real-time though is limited by the Town's ability to make rapid communications through social media and the reliance of internet net access which can be vulnerable during severe weather. Social media would require full-time personnel to monitor other weather emergency venues, input and monitor the situation and any responses from the public. Currently, the Town is not using Facebook or Twitter to inform the public of emergencies. Change PEA-7 to "increase public awareness of the means of receiving pending weather events through public outreach and education" like PEA-2. This measure allows the use of pamphlets, seasonal weather informational PSA as inserts in utility bills, social media posts, and public education. The National Weather Service has a robust, redundant system of providing public warnings through radio, television, and weather service radios the key is to educate the public on the means of utilizing these systems, terminology and appropriate actions to take when watches/warning are given.

Stanly County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-2	Develop Stormwater Plan.	Flooding	Low	Planning	Local	1 year after funding received	Deferred-Since this is not required, development of a plan has not been funded or made a priority. Best management practices are followed.
Property Protection							
PP-1	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, pending funding	Deferred/on-going, still investigating and following best management practices as well as identifying vulnerable properties.
Public Education and Awareness							
PEA-1	Educate public for all hazards.	All Hazards	High	Red Cross, Emergency Management	Local	2030	Ongoing-Continued public education through various mediums to include NWS Storm Ready Community Program, social media outreach, and Red Cross outreach.

City of Albemarle Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Identify flood area within the community.	Flooding	Moderate	Planning, Fire and Public Works	Local	2026, annually revise	Work is still being done to create a GIS layer that identifies structures and infrastructure that regularly flood and are not located on FIRM maps. Still working on this. Need to gather data during storm events.
P-11	Identify and map roads that were flooded or damaged by past flooding. Apply to GIS.	Flooding	Moderate	Planning, Engineering, Fire and Public Works	Local	2026	Staff now hired to complete this, estimated goal of completion deferred to 2030. Update as needed. Still working on this. Need to gather data during storm events.
P-12	Determine the reason why each road was damaged (i.e. debris in adjacent stream leading to blockage and overflow, overwhelmed	Flooding	Moderate	Fire Department, Public Works	Local	2026	Deferred - Coordinating with Public Works and Planning to collect data as needed. Will revisit in 2030. Still working on this. Need to gather data during storm events.
P-13	Identify potential mitigation activities based on damage assessment and prioritize locations for mitigation.	Flooding	Moderate	Planning, Fire and Public Works	Local	2026	No action taken. Data and staff not available. Deferred to 2026/2027 until more data is available.
P-14	Identify areas that may be damaged by future flooding events and locate alternative transportation routes to minimize disruption.	Flooding	Moderate	Planning	Local	1 year	No action taken. Data and staff not available. Deferred to 2026/2027 until more data is available
P-15	Ensure that new roads are not located in the ASFH.	Flooding	Moderate	Planning	Local	2026	Collecting data on newly adopted roads and mapping in GIS. Deferred to 2026/2027 until more data is available
P-17	Participate in the Community Rating System	Flooding	Moderate	Planning	Local	2 years	Deferred – working to achieve CRS with DPS and FEMA. Currently doing this, annual updates to DPS.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
P-20	Develop a fire management plan that includes a clear statement of objectives and that incorporates information on land, threatened structures, degree of fire risk, fire history and fire management measures.	Wildfire	Moderate	Fire Department	Local	2026	Deferred – no action has been taken. Staff not available.
P-25	Monitor water resource facilities. Audit and training employees on security and response procedures in the event of a chemical spill that may impact the drinking water supply.	Hazardous Substances	Moderate	Public Utilities	Local	2026	Deferred – waiting to be updated by Public Utilities
P-26	Partner with the North Carolina Department of Environment and Natural Resources as well as Yadkin River stakeholders (e.g. emergency management agencies, and water resource providers) to monitor Yadkin River conditions and the reporting/monitoring of chemical spills in other jurisdictions that would impact the Yadkin River basin.	Hazardous Substances	Moderate	Public Utilities	Local	2026	Deferred – waiting to be updated by Public Utilities
Property Protection							
PP-3	Pursue projects to install shatter-resistant glass in home and/or businesses.	All Hazards	Moderate	Administration	Local	2026	Deferred - action has not been completed due to funding constraints and limited staff availability. This action will be revisited by 2026.
Emergency Services							
ES-5	Obtain and install a second source of power for critical facilities and other public buildings to operate despite the negative effect of hazards on the main power source.	All Hazards	Moderate	Administration	Local	Completed	Complete. Most stations have back-up generators. This action will be removed from the 2030 plan update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Public Education and Awareness							
PEA-6	Provide safety recommendations for mobile home residents based on modern research.	Tornadoes/ Thunderstorms	Moderate	Planning, Fire Department, PIO	Local	2026	This action will be completed by 2030. New trailer parks are not permitted and single manufactured units are difficult to install under new ordinances. Decreasing numbers.
PEA-9	Sponsor a "Helping your Neighbors" program at local schools to encourage children to think of those persons who require special assistance, such as elderly people, infants, or people who live with disabilities.	Tornadoes/ Thunderstorms	Moderate	Fire Department, PIO	Local	2026	Deferred not completed due to funding constraints and limited staff. Action will be reviewed in 2026.
PEA-10	Conduct a series on how to protect yourself during a tornado in case you are at home, in a car, at the office or outside.	Tornadoes/ Thunderstorms	Moderate	Fire Department, PIO	Local	2026	Deferred not completed due to funding constraints and limited staff. Action will be reviewed in 2026.
PEA-11	Compile tornado mitigation information and make it available to Albemarle residents and business owners.	Tornadoes/ Thunderstorms	Moderate	Fire Department	Local	2026	Deferred not completed due to funding constraints and limited staff. Action will be reviewed in 2026.
PEA-13	Update the internet based emergency information website to inform and educate citizens about potential risks from hazards and potential ways to mitigate them.	All Hazards	Moderate	Administration, PIO	Local	2026	Deferred not completed due to funding constraints and limited staff. Action will be reviewed in 2026.
PEA-14	Conduct school educating programs to educate students about potential risks from hazards and potential ways to mitigate them.	Tornadoes/ Thunderstorms, Earthquakes, Severe Winter Weather	Moderate	Administration, PIO, Fire Department	Local	2026	Deferred not completed due to funding constraints and limited staff. Action will be reviewed in 2026.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-15	Erect signs that convey local wildfire conditions and place in obvious locations.	Wildfires	Moderate	Forest Service, Fire Department	Local	2026	Deferred not completed due to funding constraints and limited staff. Action will be reviewed in 2026. Need to consult with NCFS about this program.

Town of Badin Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Identify areas prone to flooding.	Flooding	Moderate	Badin Public Works	Local	2030, Annually as necessary	The State of North Carolina, as one of FEMA's Cooperating Technical Partner states, maintains the regulatory flood maps for the County. The County, and thus its jurisdictions, participates in identifying and remapping efforts as requested and will continue to do so when the State updates the maps next. The current effective date for the town's flood maps is 06/06/09.
Property Protection							
PP-1	Develop a stormwater management plan (clean ditches, check pipe flow).	Flooding	High	Badin Public Works	Local, Grants	2030, pending funding	Deferred -Due to staff and funding constraints, a stormwater management plan has not yet been developed. update.
PP-2	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, pending funding	Deferred – Will continue pending funding
Emergency Services							
ES-1	Develop an Emergency Warning Plan.	All Hazards	Moderate	Badin Fire/Public Safety	Local	2030	Deferred - Due to staff and funding constraints, an Emergency Warning Plan has not yet been developed.

Public Education and Awareness							
Action #	**Description**	**Hazard(s) Addressed**	**Relative Priority**	**Lead Agency/ Department**	**Potential Funding Sources**	**Implementation Schedule**	**Implementation Status (2025)**
PEA-1	Educate public for all hazards.	All Hazards	High	Red Cross, Emergency Management	Red Cross	2030, annually as necessary	Deferred – will continue with education with assistance from County Emergency Management

City of Locust Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Property Protection							
PP-1	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030	City identified and raised a number of manholes to prevent inflow and infiltration. Manhole rehab continues to be a priority to prevent flooding and City will continue to upfit and raise manholes as funding allows.
Structural Projects							
SP-1	Upgrade existing stormwater pipes, ditches, and drainage on city streets.	Flooding	Moderate	Transportation	Power bill, General Fund	2030, annually revise	City of Locust does not own/operate a storm water system. But ordinances are in place to provide adequate construction of stormwater systems within subdivisions to prevent flooding and to achieve soil/erosion control.
Emergency Services							
ES-2	Early warning siren system.	All Hazards	Moderate	Public Safety	Grant, General fund	2030	This action will be revisited during the 2030 mitigation plan update and will be implemented as funding allows.
Public Education and Awareness							
PEA-1	Educate public for all hazards.	All Hazards	High	Red Cross, Emergency Management	Red Cross	2030	Deferred. Will continue with education with assistance from Emergency Management

Village of Misenheimer Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Property Protection							
PP-1	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, pending funding	Deferred. Will continue pending funding sources.
Public Education and Awareness							
PEA-1	Educate public for all hazards.	All Hazards	High	Village of Misenhemier	Local	2030	Deferred. Will continue with education with assistance from Emergency Management

Town of New London Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Property Protection							
PP-1	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, pending funding	Deferred. Will continue pending funding sources.
Public Education and Awareness							
PEA-1	Educate public for all hazards.	All Hazards	High	Town of New London	Local	2030	Deferred. Will continue with education with assistance from Emergency Management

Town of Norwood Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Town needs second water supply in case the dam on Lake Tillery (Pee Dee River) is discharged- connect to Stanly County line on Maulden Road.	Drought, Wildfires	High	Department of Utility	Local	2030	The action will be revisited during the 2030 hazard mitigation plan update.
Property Protection							
PP-1	Replace sewer lines in Crawley Street section of town.	Hazardous Substances	High	Wastewater Department	State, Federal grants	Contingent on when grants are approved	The action will be revisited during the 2030 hazard mitigation plan update.
PP-2	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, pending funding	City identified and raised a number of manholes to prevent inflow and infiltration. Manhole rehab continues to be a priority to prevent flooding and Town will continue to upfit and raise manholes as funding allows.
Natural Resource Protection							
NRP-1	Better manage stormwater runoff.	Flooding	Moderate	Parks and Recreation	Local	2030, annually revise	This action will be monitored annually. This action will remain in the plan to help maintain vigilance.
Public Education and Awareness							
PEA-1	Educate public for all hazards.	All Hazards	High	Red Cross, Emergency Management	Red Cross	2030	Deferred. Will continue with education with assistance from Emergency Management

Town of Oakboro Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Prepare and adopt a town-wide Stormwater Management master plan.	Flooding	High	Zoning	Budget	When funding becomes available, 2030	Deferred – Will continue pending funding. This action will be revisited.
P-2	Get board approval and conduct tabletop exercise for Emergency Operations Plan.	All Hazards	High	Board of Commissioners	Budget	When funding becomes available, 2030	Deferred – Will continue pending funding. This action will be revisited.
P-3	Conduct a stormwater drainage study/plan for known problem areas.	Flooding	High	Zoning	Budget	When funding becomes available, 2030	Deferred – Will continue pending funding. This action will be revisited.
P-4	Urge direct burial of phone and electrical lines where appropriate.	Severe Winter Weather, Tornadoes/ Thunderstorm, Hurricane and Coastal Hazards	High	Telephone/Electric Companies	Telephone/Electric Companies	When funding becomes available, 2030	Deferred – Will continue pending funding. This action will be revisited.
Property Protection							
PP-1	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, pending funding	Deferred. Will continue pending funding sources.
Public Education and Awareness							
PEA-1	Educate public for all hazards.	All Hazards	High	Red Cross, Emergency Management	Red Cross	2030, annually revise	Deferred. Will continue with education with assistance from Emergency Management

Town of Red Cross Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Property Protection							
PP-1	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, continual	Deferred. Will continue monitoring and addressing any hazards as they arise.
Public Education and Awareness							
PEA-1	Educate public for all hazards.	All Hazards	High	Town of Red Cross	Local	2030, continual	Deferred. Will continue with education with assistance from Emergency Management, including sharing education through our communication portals to our citizens.

Town of Richfield Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Property Protection							
PP-1	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, pending funding	Deferred. Will continue pending funding sources.
Public Education and Awareness							
PEA-1	Educate public for all hazards.	All Hazards	High	Town of Richfield	Local	2030, annually revise	Deferred. Will continue with education with assistance from Emergency Management

Town of Stanfield Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Property Protection							
PP-1	Utilize acquisition, elevation, or retrofitting to protect personal properties from hazards.	All Hazards	High	Emergency Management	State, Local	2030, pending funding	Deferred. Will continue pending funding sources.
Public Education and Awareness							
PEA-1	Develop water conservation education programs.	Drought	Moderate	Utilities	Grants, Budget	6-12 months	Deferred. This action will be revisited during the 2030 hazard mitigation plan update.
PEA-1	Educate public for all hazards.	All Hazards	High	Town of Stanfield	**L**ocal	2030, annually revise	Deferred. Will continue with education with assistance from Emergency Management

Union County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-2	Continue to actively participate in the NFIP by monitoring and enforcing current flood ordinances.	Flooding	Low	Planning	N/A	Annually	Continuing our current participation in NFIP. No changes to our ordinance are anticipated due to our strong regulations currently in place. This action will remain in the plan to help maintain vigilance.
P-3	Prohibit the placement of earthen fill in identified floodplain areas that would raise base flood elevations.	Flooding	Low	Planning	N/A	Ongoing	Fill is not allowed in the floodplain unless it can be demonstrated that no increase to flood levels will result from the fill placement. This action will remain in the plan to help maintain vigilance.
P-4	Research, develop and adopt a local tree ordinance that will encourage the preservation of healthy trees in large-scale developments and the removal of "hazard" trees along public rights of way as part of the Land Use Ordinance.	Hurricane and Coastal Hazards, Severe Winter Weather, Tornadoes/ Thunderstorms	Low	Planning	N/A	2030	Deferred. As of the 2024 hazard mitigation plan update, this action has not been implemented. Implementation is pending staff time, funding. Action will be revisited during the 2030 hazard mitigation plan update.
P-5	Expand GIS/GPS capability for Union County agencies.	All Hazards	Low	Public Health	Local	Ongoing	Public Health continues to identify access and functional need populations. GIS is a regular participant in the Emergency Operations Center.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
P-10	Develop a local dam safety and inspection program.	Dam Failure, Flooding	Low	NCDEQ	DHS, National Dam Safety Program, NCDEQ, USACE	Ongoing	The Dam Safety Program is administered by the NC Division of Environmental Quality (NC DEQ). All Dams within Union County have been identified by DEQ. Union County EM works in conjunction with DEQ when needed for Dam safety issues. High hazard and moderate hazard DAMS specifically, have been identified for the States' aerial program, which will ensure the State and local government visually observe where each high hazard dam is located and their inundation impact. Less than 1/3 of the high hazard Dams have submitted their Emergency Action Plan. This is an on-going process between the State and Dam owner to improve
P-11	Perform small area flood studies of problematic, flood prone areas to determine infrastructure and regulatory deficiencies. Studies will also provide cost estimates to upgrade inadequate infrastructure.	Flooding	Low	Planning	N/A	2025, ongoing	New action for the 2025 update

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
P-12	Implement aspects of the UC2050 Comprehensive Plan related to stormwater and flooding. Specifically, increasing stormwater detention from the 25 to the 50-year storm event, expanding stormwater detention requirements to all types of development and incentivizing development that reduces mass grading.	Flooding	Low	Planning	N/A	2025, ongoing	New action for the 2025 plan update
P-13	Implement the recommendation in the UC2050 Comprehensive Plan to require a downstream analysis of impacts to stream structures associated with development and require mitigation when impacts caused by development activities cause an increase in flooding.	Flooding	Low	Planning	N/A	2025, ongoing	New action for the 2025 plan update.
Public Education and Awareness							
PEA-1	Develop procedures for public education for pre-storm debris removal.	Severe Winter Weather, Hurricane and Coastal Hazards, Tornadoes/ Thunderstorms	Moderate	Emergency Management	TBD	Ongoing	Union County Emergency Management will provide information on the website to educate residents on pre-storm debris removal
PEA-3	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	Ongoing	Emergency Management regularly updates its website to provide information to residents for severe weather events.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-5	Improve public education on the removal and disposal of storm generated debris from private property.	Hurricane and Coastal Hazards, Severe Winter Weather, Tornadoes/ Thunderstorms	Low	Emergency Management	TBD	Ongoing	Emergency Management will develop guidance and post on the website.
PEA-6	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, Flooding, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	Ongoing	Storm preparedness initiatives and guidance is provided on the Red Cross and Emergency Management websites.

Town of Fairview Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates Flooding mitigation strategies with open space management techniques.	Flooding	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2030, Annual update and review	The is implemented through the open space and Greenway program. Action to remain in plan to help maintain vigilance with implementation.
Public Education and Awareness							
PEA-1	Send appropriate local officials to FEMA's Emergency Management Institute (EMI) for continuing education and professional development in emergency management.	All Hazards	Moderate	Emergency Management	FEMA, Local Operating Budget	Reviewed annually.	Every year training is done as needed. This action will remain in the plan to help maintain vigilance.
PEA-3	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	This is implemented through EM and ARC. This action will remain in the plan to help maintain vigilance.
PEA-4	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, Flooding, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	This is implemented through EM and ARC. This action will remain in the plan to help maintain vigilance.

Town of Hemby Bridge Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Public Education and Awareness							
PEA-1	Send appropriate local officials to FEMA's Emergency Management Institute (EMI) for continuing education and professional development in emergency management.	All Hazards	Moderate	Emergency Management	FEMA, Local Operating Budget	Reviewed annually.	Union County has designed a series of trainings regarding awareness for municipalities and their citizens. Municipalities attend and are encouraged to participate in free training at the State level. Union County has also offered local HSEEP table-top exercises to municipalities.
PEA-2	Raise public awareness of natural hazards that could affect the area.	All Hazards	Moderate	Emergency Management	Local	2030	Union County has identified local and regional grants and have applied for same. These grants are designed to utilize multiple distribution methods, including local bill-boards, to heighten the awareness of all-hazard preparation. Additionally, lectures and presentations about weather related preparedness to local organizations by Emergency Management is continuous.
PEA-3	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	American Red Cross links are recommended and implemented with all Union County municipalities and can be located on their web-sites.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-4	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, Flooding, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	ARC recently re-located and are highly visible throughout the county @ vendor fairs educating public on preparedness. Also ARC has been instrumental in preparing Union County with sheltering procedures. Fire Marshal's Office has undertaken fire extinguisher training for all interested staff.

Town of Indian Trail Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Natural Resource Protection							
NRP-1	Expand the Adopted Tree Ordinance and conduct a Canopy Assessment.	Wildfires, Tornadoes/ Thunderstorms	Moderate	Town Administration	Local	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
NRP-2	Renew Storm Water Maintenance contract.	Flooding	High	Engineering	Stormwater Utility	Annually	This action is completed on an annual basis. Action to remain in plan to help maintain
NRP-3	Create a Sedimentation and Erosion Control Program	Geological (Erosion)	Low	Engineering	Local	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
Emergency Services							
ES-1	Draft and adopt an Emergency Operations Plan.	All Hazards	Moderate	Town Administration	Local	2030	There has been progress made since the previous update, but this action is still in progress.
ES-2	Investigate the creation of a Continuity of Operations Plan.	All Hazards	Low	Town Administration	Local	2030	This action is in progress. Staff has initiated the process. Implementation status will be updated in 2030
Public Education and Awareness							
PEA-2	Raise public awareness of natural hazards that could affect the area.	All Hazards	Moderate	Emergency Management	Local	Annually	In addition to the County's programs, the Town regularly communicates to citizens via social media and town website, and when needed for weather events.

Village of Lake Park Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Property Protection							
PP-1	Maintain 13 stormwater ponds to prevent localized flooding.	Flooding	High	Village Council	Grant Program & Stormwater utility	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flooding	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2030	The Open Space and Greenway program is currently being developed and parts have been implemented but this task is not complete and more planning and implementation is required.
Structural Projects							
SP-1	Address aging stormwater infrastructure.	Flooding	High	Village Council	Stormwater utility	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Public Education and Awareness							
PEA-1	Educate residents about potential natural disasters.	All Hazards	Moderate	Village Council	Local	2030	The Village provides information about natural disaster and County Emergency Management information/happenings on the Village website and in the Village newsletter. The action will be revisited in 2030 to determine further progress made.
PEA-2	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	Emergency Management has coordinated with the Union County WebMaster to ensure checklist is available to residents on the Emergency Management web page. Ready.goc and NC Ready links are currently on the webpage.
PEA-3	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, flood, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	"Be Red Cross Ready" is an education tool/brochures which are distributed and discussed with county residents weekly at local fairs and events. Also listed on web page.
PEA-4	Educate the public of drainage problems through the newsletter and social media.	Flooding	Moderate	Village Council	Stormwater utility	2030, Annual review and update of material	This action is deferred pending staff time and funding. Action will be revisited in 2030.

Town of Marshville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Public Education and Awareness							
PEA-1	Raise public awareness of natural hazards that could affect the area.	All Hazards	Moderate	Emergency Management	Local	2030	The county has implemented several programs to better educate the public, but additional outreach is necessary. This action will be reevaluated in 2030.
PEA-2	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	Emergency Management has coordinated with the Union County WebMaster to ensure checklist is available to residents on the Emergency Management web page. Ready.goc and NC Ready links are currently on the webpage.
PEA-3	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, flood, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	"Be Red Cross Ready" is an education tool/brochures which are distributed and discussed with county residents weekly at local fairs and events. Also listed on web page.

Village of Marvin Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Develop a plan to identify and address cleaning of problematic street drainage sites, including the creation of an emergency response team.	Flooding	Moderate	Stormwater	Local, Stormwater Services	2025, Annual review and update	New Action for the 2025 plan update. Village Engineer and Public Works staff will work with County and NCDOT representatives on maintenance plan. Routine video inspection and vacuum cleaning occurs daily.
P-2	Continue to actively participate in the NFIP by monitoring and enforcing current flood ordinances.	Flooding	Low	Planning	N/A	Annually	New Action. Continuing our current participation in NFIP. Village updated our ordinance in May of 2024 and no change to our ordinance is anticipated due to strong regulations in place.
P-3	Identify and map roads that were flooded or damaged by past flooding. Apply to GIS and Floodplain Database.	Flooding	Moderate	Planning, Engineering	Local	2025	New Action. Staff working complete this, estimated goal of completion of 2025. Update as needed.
P-3	Designate a local floodplain manager/CRS coordinator that achieves CFM certification and enters the Village into the NFIP's Community Rating System.	Flooding	Moderate	Planning	General Fund	2025	New Action. The Planning and Zoning Director is currently working on obtaining CFM. Village is not a member of CRS. This action is anticipated to be completed by 2025.
Property Protection							
PP-1	Develop a stormwater management plan (clean ditches, check pipe flow).	Flooding	High	Public Works	Local, Grants	2030, pending funding	New Action. Staff is recommending completing a stormwater management plan. This is contingent upon funding.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Natural Resource Protection							
NRP-1	Restrict developments/land development on slopes greater than 15%.	Geological (Erosion)	High	Planning	Local	Action Completed	This action is completed with the adoption of the Marvin Development Ordinance (5-2024). New ordinance restricts type of development on slopes greater than 15% (3:1) This action will be removed during the 2030 plan update.
NRP-3	Update Tree Preservation Restrictions—not allow internal and external tree preservation on individual lots.	Tornadoes/ Thunderstorms, Severe Winter Weather	Low	Planning	Local	2030	Deferred, low priority: This issue will be re-evaluated for potential deletion in 2030.
Structural Projects							
SP-1	Identify and evaluate the need to increase dimensions of drainage culverts in troublesome areas.	Flooding	Moderate	Planning	General funds, DHS/FEMA grants	2030	The Village is currently inspecting and inventorying the infrastructure.
Public Education and Awareness							
PEA-1	Educate the public about potential natural hazards and safety measures that can be taken.	All Hazards	Moderate	Planning and Public Works	General Funds	2025, Annual review and update	New Action. The County has implemented several programs to better educate the public, and Village Staff will provide additional outreach and resources for the Residents of Marvin.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-2	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Village Administration, Emergency Management, American Red Cross	Local, Citizen Corps, FEMA/Red Cross publications	2025, Annual review and update	New Action. Emergency Management has coordinated with the Union County WebMaster to ensure checklist is available to residents on the Emergency Management web page. Village has included links to this on our Webpage.
PEA-3	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, flood, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2025, Annual review and update	New Action. "Be Red Cross Ready" is an education tool/brochures which the Village will have available and list on web page.

Town of Mineral Springs Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flooding	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2030	The town is working with Catawba Lands Conservancy restoring native vegetation and removing invasives in the floodplain to improve soil permeability.
Emergency Services							
ES-2	Encourage appropriate emergency services training and continuing education to Fire Department members.	All Hazards	High	Fire Department	Local, State	Annually	No changes, the fire department continues to conduct training on an annual basis.
Public Education and Awareness							
PEA-2	Raise public awareness of natural hazards that could affect the area	All Hazards	Moderate	Town Administration	Town Budget	2030, Annual reviews and update of material	The Mineral Springs website contains links for ready.gov and readync.gov.
PEA-3	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	The Mineral Springs website has a link to the Union County website.
PEA-4	Offer disaster preparedness education; “Be Red Cross Ready” for hurricane, flood, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	Will provide a link on the town website for Red Cross.

City of Monroe Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-4	Develop stormwater illicit discharge detection.	Flooding	Moderate	Engineering	Local	2030	Critical areas complete. This action remains ongoing.
P-7	Designate a local floodplain manager/CRS coordinator that achieves CFM certification and enters the City of Monroe into the NFIP's Community Rating System.	Flooding	Moderate	Engineering	General Fund	2030	Partially complete. Engineering recently lost their CFM but are in the process of hiring a new one.
P-8	Developed an Open Space/Greenway Plan that integrates storm water discharge strategies with open space management techniques.	Flooding	Moderate	Planning, Parks and Recreation, Engineering	General Fund	2030	Implementation is ongoing
P-9	Require sprinkler systems in various buildings.	Wildfires	Moderate	Planning and Development	General Fund	Ongoing	Adopted in 2018 and ongoing
Structural Projects							
SP-2	Increase dimension of drainage culverts in troublesome areas, including NFIP-designated Repetitive Loss Property zones.	Flooding	Moderate	Engineering	Local	2030	As of 2024 this action has not been completed due to funding constraints and limited staff time for implementation. This action will be revisited during the 2030 update.
SP-3	Examine the cost and benefit of increasing flood protection at the City's wastewater treatment plant above the 100 year level which is currently in place, with a goal of protecting to the 500 year flood elevation.	Flooding	Moderate	Water Resources Department	Capital Budget Project	2030	Deferred. TBD as part of design of the next full plant expansion project In Year 2030.
Public Education and Awareness							

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-1	Advertise and promote the availability of flood insurance.	Flooding	Moderate	Planning & Engineering	General Funds	2030	This action remains part of the Planning and Engineering Departments' ongoing activities.
PEA-2	Raise public awareness of natural hazards that could affect the area.	All Hazards	Moderate	Engineering	City Budget	2030, annually revise	This is actively being implemented.
PEA-3	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	Emergency Management has coordinated with the Union County WebMaster to ensure checklist is available to residents on the Emergency Management web page. Ready.goc and NC Ready links are currently on the webpage.
PEA-4	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, flood, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	"Be Red Cross Ready" is an education tool/brochures which are distributed and discussed with county residents weekly at local fairs and events. Also listed on web page.

Town of Stallings Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Natural Resource Protection							
NRP-1	Stabilize identified erosion hazard areas.	Geological (Erosion)	Low	Engineering	Stormwater	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
Public Education and Awareness							
PEA-1	Launch public education campaign to protect groundwater and related environmental issues.	All Hazards	Moderate	Town and County Administration	Local	2030	Required per condition of Phase II Stormwater permit
PEA-2	Conduct public education concerning natural hazards that could affect the town.	All Hazards	Moderate	Town Administration	Local	2030	The county has implemented several programs to better educate the public, but additional outreach is necessary so this action will be completed by 2030.
PEA-3	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	ARC recently re-located and are highly visible throughout the county @ vendor fairs educating public on preparedness. Also ARC has been instrumental in preparing Union County with sheltering procedures. UC Fire Marshal's Office has undertaken fire extinguisher training for all interested staff.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-4	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, flood, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	ARC recently re-located and are highly visible throughout the county @ vendor fairs educating public on preparedness. Also ARC has been instrumental in preparing Union County with sheltering procedures. UC Fire Marshal's Office has undertaken fire extinguisher training for all interested staff.

Town of Unionville Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flooding	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2030	This task remains incomplete and more planning and implementation are required.
Public Education and Awareness							
PEA-3	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	Ready.gov and NC Ready links have been added to the Town's website.
PEA-4	Offer disaster preparedness education; “Be Red Cross Ready” for hurricane, Flooding, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	"Be Red Cross Ready" is added to the Town's website.

Town of Waxhaw Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-1	Maintain the debris management plan.	All Hazards	Moderate	Emergency Management/ Public Services	Local	Annually	Review and determine need for updates annually.
P-3	Require sprinkler systems in older structures.	Wildfires	Moderate	Waxhaw Board of Commissioners	Local	2030	Implementation determined by Board of Commissioners.
P-4	Implement flooding mitigation at Town Hall Annex (P&R offices) located at 317 N. Broome Street	Flooding	High	Parks & Recreation	FEMA and local	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
P-5	Create interconnectivity/additional egress from existing subdivisions (approximately 30). New developments should follow regulations requiring multiple ingress/egress points.	Flooding, Wildfires	High	Engineering	Local	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
Property Protection							
PP-1	Develop a Debris Management Plan	All Hazards	Moderate	Emergency Management/Public Services	Local	2030 Sites: Compost, 34 acres, Hwy 75	Get local sites approved by the state for temporary debris. Draft RFP for debris management contract. Award a debris management contract to have in place prior to any emergency events. Develop a policy in accordance with BMP on how often re-bid the debris management contract.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PP-2	Seek opportunities for mitigation of stream banks and debris removal.	Flooding	Moderate	Emergency Management/Parks and Recreation	FEMA, State, Local	2030	Grants team will annually seek funding opportunities for stream bank mitigation and debris removal. Local contribution as funding allows.
Emergency Services							
ES-1	Develop a Continuity of Operations Plan (COOP) for all facilities, departments, and operations of the town	All Hazards	High	Emergency Management	Local	2025	Plan development underway. Completion is 2025
ES-2	Elevate Emergency Operations Training Requirements for staff. Department Heads will be required to take at least NIMS/ICS 100, 200, 300, 400, 700, and 800. As local EM program develops, key staff may be required to take additional FEMA courses.	All Hazards	Moderate	Emergency Management	Local	Annually	Review and determine need for updates annually.
ES-3	Hold regular Table Top Exercises (TTX) regularly 1-2 times per year.	All Hazards	Moderate	Emergency Management	Local	Annually	Continue to conduct table top exercises annually in Spring.
ES-4	Maintain local Emergency Operations Plan (EOP)	All Hazards	Moderate	Emergency Management	Local	Annually	Communications in partnership with Emergency Management will develop a campaign that focuses on natural hazard awareness.
Public Education and Awareness							
PEA-1	Raise public awareness of natural hazards that could affect the area	All Hazards	Moderate	Communications/ Emergency Management	Local	2025	Communications in partnership with Emergency Management will develop a campaign that focuses on natural hazard awareness.
PEA-2	Conduct an annual training session with EM personnel on communicating clearly and effectively with the media.	All Hazards	Moderate	Communications	Local	2025	New action for the 2025 update:

Town of Weddington Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-4	Limit floodplain development through strenuous permitting processes.	Flooding	High/ Moderate	Planning and Zoning	Local/General Funds	2030, Annual review and update	Progress has been made since the previous update.
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flooding	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2030, Annual review and update	Progress has been made since the previous update.
NRP-2	Update subdivision ordinance to include useable open space - high percentage and less clear cutting	Flooding	High	Planning	General Funds	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
NRP-3	Adopted a new erosion control ordinance. Local program to moderate versus state	Geological (Erosion)	High	Planning	General Funds	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
NRP-4	Develop a New Tree Ordinance to further protect from clear cutting	Tornadoes and Thunderstorms, Hurricanes and Coastal Hazards, Severe Winter Weather	High	Planning	General Funds	2030	This action is deferred pending staff time and funding. Action will be revisited in 2030.
Public Education and Awareness							
PEA-1	Educate the public about potential natural hazards and safety measures that can be taken.	All Hazards	Moderate	Town Administration	General Funds	2030, Annual review and update	The county has implemented several programs to better educate the public, but additional outreach is necessary.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-2	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update	Emergency Management has coordinated with the Union County WebMaster to ensure checklist is available to residents on the Emergency Management web page.
PEA-3	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, Flooding, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update	"Be Red Cross Ready" is an education tool/brochures which are distributed and discussed with county residents weekly at local fairs and events. Also listed on web page.

Village of Wesley Chapel Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flooding	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2030	No updates on this have occurred in 2025 within Wesley Chapel. The Village is currently reviewing the development of a Comprehensive Plan where this can be folded into the document.
Emergency Services							
ES-1	Acquire training in wildfire suppression for the Wesley Chapel Volunteer Fire Department and the Bakers Volunteer Fire Department.	Wildfire	High	Fire Department	Fire Department	2030, Annual review and update	Required disaster training is on-going for fire department.
ES-2	Routine inspection of accessibility, proper function, and a numbering system for record keeping of fire hydrants in the Village of Wesley Chapel and surrounding municipalities and County areas.	Wildfire	Moderate	Fire Department	Fire Department	2030, Annual review and update	Process has been implemented for hydrant numbering and system check.
ES-3	Acquire disaster training for firefighters.	All Hazards	High	Fire Department	Fire Department	2030, Annual review and update	Required disaster training is implemented through the fire department.
Public Education and Awareness							
PEA-1	Ensure public awareness of potential natural hazards and safety actions that can be taken.	All Hazards	Moderate	Village Council	Local	2030, Annual review and update	Requested links are still placed on the Village of Wesley Chapel's website. (Ready.gov; readync.org; nccrimecontrol.org)
PEA-2	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update	The county webpage for EM has been revised and provides citizens with multiple resources in emergency preparedness for all-hazards.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
PEA-3	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, Flooding, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update	American Red Cross initiatives can be located @ redcross.org.

Town of Wingate Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Prevention							
P-2	Adopt minimum residential street width by ordinance.	All Hazards	High	Administration	General Funds	2030	This action is currently in progress. Action will be revisited in 2030.
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flooding	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2030	The Greenway Master Plan was adopted and the University Loop bike trail was completed in 2016 around Meadow Branch. This task is not complete and has not been fully implemented. The Spring 2019 scheduled adoption of Wingate's Land Use Ordinance includes the addition of open space and park space requirements.
Public Education and Awareness							
PEA-1	Conduct public education concerning the natural hazards that could affect the town.	All Hazards	Moderate	Administration	Local	2030	An effort will be made to utilize website and social media avenues to present information to the public.
PEA-2	Provide hazard susceptibility checklists for homeowners to conduct hazard risk inspections for their own property and link information on Union County website.	All Hazards	Moderate	Emergency Management, American Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2030, Annual review and update of material	An effort will be made to push Ready.gov and ReadyNC.org information through website and social media.
PEA-3	Offer disaster preparedness education; "Be Red Cross Ready" for hurricane, Flooding, Severe Winter Weathers, etc.	All Hazards	High	American Red Cross	American Red Cross	2030, Annual review and update of material	An effort will be made to push Red Cross information through website and social media to the public.

SECTION 10

PLAN MAINTENANCE PROCEDURES

44 CFR Requirement

44 CFR Part201.6(c)(4)(i):
The plan shall include a plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle.

44 CFR Part 201.6(c)(4)(ii):
The plan maintenance process shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

This section discusses how the Cabarrus Stanly Union Region Mitigation Strategy and Mitigation Action Plan will be implemented and how the Regional Hazard Mitigation Plan will be evaluated and enhanced over time. This section also discusses how the public will continue to be involved in a sustained hazard mitigation planning process. It consists of the following three subsections:

- 10.1 Implementation and Integration
- 10.2 Monitoring, Evaluation and Enhancement
- 10.3 Continued Public Involvement
- 10.4 Evaluation of Monitoring, Evaluation and Update Process

10.1 IMPLEMENTATION AND INTEGRATION

Each agency, department or other partner participating under the Cabarrus Stanly Union Regional Hazard Mitigation Plan is responsible for implementing specific mitigation actions as prescribed in the Mitigation Action Plan. Every proposed action listed in the Mitigation Action Plan is assigned to a specific "lead" agency or department to assign responsibility and accountability and increase the likelihood of subsequent implementation.

In addition to the assignment of a local lead department or agency, an implementation time period or a specific implementation date has been assigned in order to assess whether actions are being implemented in a timely fashion. The participating jurisdictions in the Cabarrus Stanly Union Region will seek outside funding sources to implement mitigation projects in both the pre-disaster and post-disaster environments. When applicable, potential funding sources have been identified for proposed actions listed in the Mitigation Action Plan.

The participating jurisdictions will integrate this Hazard Mitigation Plan into relevant City and County government decision-making processes or mechanisms, where feasible. This includes integrating the requirements of the Hazard Mitigation Plan into other local planning documents, processes or mechanisms, such as comprehensive or capital improvement plans, when appropriate. The members of the Cabarrus Stanly Union Regional Hazard Mitigation Planning Committee will remain charged with ensuring that the goals and mitigation actions of new and updated local planning documents for their agencies or departments are consistent, or do not conflict with, the goals and actions of the Hazard Mitigation Plan, and will not contribute to increased hazard vulnerability in the Cabarrus Stanly Union Region. Methods for integration may include:

- Monitoring other planning/program agendas;
- Attending other planning/program meetings;
- Participating in other planning processes; and
- Monitoring community budget meetings for other community program opportunities.

Since the initial plan was adopted in 2015 for all three counties, and with each County-specific plan prior to that, each County and participating jurisdiction has worked to integrate the hazard mitigation plan into other planning mechanisms where applicable/feasible. Examples of how this integration has occurred have been documented in the Implementation Status discussion provided for each of the mitigation actions found in Section 9. Specific examples of how integration has occurred include:

- Integrating the mitigation plan into reviews and updates of floodplain management ordinances
- Integrating the mitigation plan into reviews and updates of County emergency operations plans
- Integrating the mitigation plan into review and updates of building codes
- Integrating the mitigation plan into the capital improvements plan through identification of mitigation actions that require local funding.

Opportunities to further integrate the requirements of this Plan into other local planning mechanisms shall continue to be identified through future meetings of the Regional Hazard Mitigation Planning Committee, individual county meetings, and the annual review process described herein.

10.2 MONITORING, EVALUATION, AND ENHANCEMENT

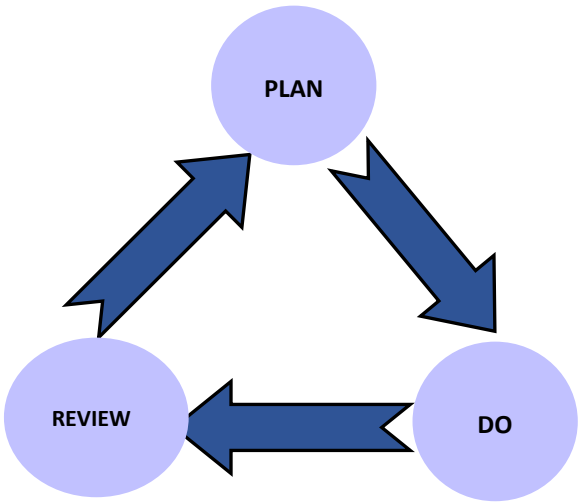
Periodic revisions and updates of the Hazard Mitigation Plan are required to ensure that the goals of the Plan are kept current, taking into account potential changes in hazard vulnerability and mitigation priorities. In addition, revisions may be necessary to ensure that the Plan is in full compliance with applicable federal and state regulations. Periodic evaluation of the Plan will also ensure that specific mitigation actions are being reviewed and carried out according to the Mitigation Action Plan.

When determined necessary, the Cabarrus Stanly Union Regional Hazard Mitigation Planning Committee shall meet in March of every year to evaluate and monitor the progress attained and to revise, where needed, the activities set forth in the Plan. The findings and recommendations of the Regional Hazard Mitigation Planning Committee shall be documented in the form of a report that can be shared with interested City and County Council members. The Regional Hazard Mitigation Planning Committee will

also meet following any disaster events warranting a reexamination of the mitigation actions being implemented or proposed for future implementation. This will ensure that the Plan is continuously updated to reflect changing conditions and needs within the Cabarrus Stanly Union Region. For future updates of the plan, North Carolina Emergency Management's Hazard Mitigation Planning section will help coordinate the reconvening the Regional Hazard Mitigation Planning Committee for these reviews through coordination with each County's Emergency Management Departments.

FIVE (5) YEAR PLAN REVIEW

The Plan will be thoroughly reviewed by the Regional Hazard Mitigation Planning Committee every five years to determine whether there have been any significant changes in the Cabarrus Stanly Union Region that may, in turn, necessitate changes in the types of mitigation actions proposed. New development in identified hazard areas, an increased exposure to hazards, an increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the necessary content of the Plan.



The plan review provides participating jurisdiction officials with an opportunity to evaluate those actions that have been successful and to explore the possibility of documenting potential losses avoided due to the implementation of specific mitigation measures. The plan review also provides the opportunity to address mitigation actions that may not have been successfully implemented as assigned. North Carolina Emergency Management's Hazard Mitigation Planning section will help coordinate the reconvening the Regional Hazard Mitigation Planning Committee and conducting the five-year review through coordination with each County's Emergency Management Departments.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Has the nature or magnitude of risks changed?
- Are the current resources appropriate for implementing the Plan?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- Have the outcomes occurred as expected?

- Did County departments participate in the plan implementation process as assigned?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the Cabarrus Stanly Union Regional Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at the North Carolina Division of Emergency Management (NCEM) for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

DISASTER DECLARATION

Following a disaster declaration, the Cabarrus Stanly Union Regional Hazard Mitigation Plan will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. It will be the responsibility of the North Carolina Emergency Management's Hazard Mitigation Planning section to coordinate the reconvening of the Regional Hazard Mitigation Planning Committee and ensure the appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

REPORTING PROCEDURES

The results of the five-year review will be summarized by the Regional Hazard Mitigation Planning Committee in a report that will include an evaluation of the effectiveness of the Plan and any required or recommended changes or amendments. The report will also include an evaluation of implementation progress for each of the proposed mitigation actions, identifying reasons for delays or obstacles to their completion along with recommended strategies to overcome them.

PLAN AMENDMENT PROCESS

Upon the initiation of the amendment process, representatives from Cabarrus Stanly and Union counties will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected County departments, residents, and businesses. Information will also be forwarded to North Carolina Emergency Management. This information will be disseminated in order to seek input on the proposed amendment(s) for no less than a 45-day review and comment period.

At the end of the 45-day review and comment period, the proposed amendment(s) and all comments will be forwarded to the Regional Hazard Mitigation Planning Committee for final consideration. The Planning Committee will review the proposed amendment along with the comments received from other parties, and if acceptable, the committee will submit a recommendation for the approval and adoption of changes to the Plan.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered by the Regional Hazard Mitigation Planning Committee:

- There are errors, inaccuracies or omissions made in the identification of issues or needs in the Plan
- New issues or needs have been identified which are not adequately addressed in the Plan
- There has been a change in information, data, or assumptions from those on which the Plan is based

Upon receiving the recommendation from the Regional Hazard Mitigation Planning Committee and prior to adoption of the Plan, the participating jurisdictions will hold a public hearing, if deemed necessary. The governing bodies of each participating jurisdiction will review the recommendation from the Regional Hazard Mitigation Planning Committee (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the governing bodies will take one of the following actions:

- Adopt the proposed amendments as presented
- Adopt the proposed amendments with modifications
- Refer the amendments request back to the Regional Hazard Mitigation Planning Committee for further revision, or
- Defer the amendment request back to the Regional Hazard Mitigation Planning Committee for further consideration and/or additional hearings

10.3 CONTINUED PUBLIC INVOLVEMENT

44 CFR Requirement

44 CFR Part 201.6(c)(4)(iii):
The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process

Public participation is an integral component to the mitigation planning process and will continue to be essential as this Plan evolves over time. As described above, significant changes or amendments to the Plan shall require a public hearing prior to any adoption procedures.

Other efforts to involve the public in the maintenance, evaluation and revision process will be made as necessary. These efforts may include:

- Advertising meetings of the Regional Hazard Mitigation Planning Committee in local newspapers, public bulletin boards and/or County office buildings
- Designating willing and voluntary citizens and private sector representatives as official members of the Regional Hazard Mitigation Planning Committee
- Utilizing local media to update the public on any maintenance and/or periodic review activities taking place
- Utilizing the Cabarrus, Stanly, and Union county websites to advertise any maintenance and/or periodic review activities taking place, and
- Keeping copies of the Plan in public libraries.

10.4 EVALUATION OF PREVIOUS MONITORING, EVALUATION AND UPDATE PROCESS

Over the past five years, the participating jurisdictions have been independently implementing, monitoring and evaluating their own mitigation action plans. Progress made in implementing actions has been documented in Section 9: *Mitigation Action Plan* where each action contains a narrative about the implementation status of the action as of 2025. That said, the jurisdiction did waiver slightly from

the monitoring and evaluation process defined in the original version of the plan, but still made significant process in implementing their mitigation action plans. During the 2020 update of this plan, the Regional Hazard Mitigation Planning Committee determined that the procedures for the upcoming five-year monitoring and evaluation process will remain as defined above and will be re-evaluated during the next plan update process.

The five-year comprehensive update process began as early as 2023 when North Carolina Emergency Management obtained HMGP funding to update the Cabarrus Stanly Union Hazard Mitigation Plan. To facilitate this effort, NCEM assigned the plan update to their pre-qualified hazard mitigation planning consultants ESP Associates. Representatives from ESP Associates first reached out to Cabarrus, Stanly, and Union representatives in February of 204 to initiate the plan update process. More details about the plan update process are provided in Section 2, Planning Process.

For the next update of this plan, NCEM's Hazard Mitigation Planning section will continue take the lead on organizing and initiating the 5-year update of the plan.

Appendix A
Plan Adoption

44 CFR Requirement
44 CFR Part 201.6(c)(5): The plan shall include documentation that the plan has been formally adopted by the local governing body of the jurisdiction requesting approval of the plan.

This section of the Plan includes a copy of the local adoption resolution passed by the participating jurisdictions in the Cabarrus Stanly Union Region.

Cabarrus County	
Concord	Midland
Harrisburg	Mount Pleasant
Kannapolis	Unincorporated Cabarrus County
Stanly County	
Albemarle	Oakboro
Badin	Red Cross
Locust	Richfield
Misenheimer	Stanfield
New London	Unincorporated Stanly County
Norwood	
Union County	
Fairview	Monroe
Hemby Bridge	Stallings
Indian Trail	Unionville
Lake Park	Waxhaw
Marshville	Weddington
Marvin	Wesley Chapel
Mineral Springs	Wingate
Unincorporated Union County	

Appendix B
Planning Tools

This section of the Plan includes the following three (3) items:

1. A Blank Public Survey
2. A Blank Capability Assessment
3. Scoring Criteria for the Capability Assessment

Cabarrus Stanly Union Regional Hazard Mitigation 2024 Plan Update - Public Survey

We need your help!

Cabarrus, Stanly, and Union Counties and the municipalities within the counties are working together to become less vulnerable to natural and man-made disasters, and your participation in the process is important to us!

The counties, along with local jurisdictions and other partners, are working to update the multi-jurisdictional Regional Hazard Mitigation Plan. This plan identifies and assesses our community's hazard risks and identifies strategies that determine how to best minimize or manage those risks.

This survey is an opportunity for you to share your opinions and participate in the mitigation planning

process. The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that should help lessen the impacts of future hazard events.

If you have any questions regarding this survey or would like to learn about more ways you can participate in the development in the Cabarrus Stanly Union Regional Hazard Mitigation Plan, please contact Hannah DeLude from ESP Associates, Inc. at hdelude@espassociates.com.

1 1\. Where do you live?*

- Unincorporated Cabarrus County
- Unincorporated Union County
- Badin
- Fairview
- Hemby Bridge
- Kannapolis
- Locust
- Marvin
- Mineral Springs
- Monroe
- New London
- Oakboro
- Richfield
- Stanfield
- Waxhaw
- Wesley Chapel
- Other
- Unincorporated Stanly County
- Albemarle
- Concord
- Harrisburg
- Indian Trail
- Lake Park
- Marshville
- Midland
- Misenhiemer
- Mount Pleasant
- Norwood
- Red Cross
- Stallings
- Unionville
- Weddington
- Wingate

* Choose one.

2 2\. Have you ever experienced or been impacted by a disaster?*

- ◯ Yes
- ◯ No

* Choose one.

3 3\. If "Yes," please explain.

4 4\. How concerned are you about the possibility of our community being impacted by a disaster?*

- ◯ Extremely concerned
- ◯ Somewhat concerned
- ◯ Not concerned

* Choose one.

5 5\. Please select the **one** hazard you think is the highest threat to your neighborhood:*

- ◯ Drought
- ◯ Excessive Heat
- ◯ Hurricane and Coastal Hazards
- ◯ Tornadoes/Thunderstorms
- ◯ Severe Winter Weather
- ◯ Dam Failures
- ◯ Flooding
- ◯ Earthquakes
- ◯ Wildfires
- ◯ Infectious Disease
- ◯ Hazardous Substances
- ◯ Radiological Emergency
- ◯ Terrorism
- ◯ Cyber
- ◯ Electromagnetic Pulse
- ◯ Food Emergency
- ◯ Civil Disturbance

* Choose one.

6 6\. Please select the **one** hazard you think is the second highest threat to your neighborhood:*

- ◯ Drought
- ◯ Excessive Heat
- ◯ Hurricane and Coastal Hazards
- ◯ Tornadoes/Thunderstorms
- ◯ Severe Winter Weather
- ◯ Dam Failures
- ◯ Flooding
- ◯ Earthquakes
- ◯ Wildfires
- ◯ Infectious Disease
- ◯ Hazardous Substances
- ◯ Radiological Emergency
- ◯ Terrorism
- ◯ Cyber
- ◯ Electromagnetic Pulse
- ◯ Food Emergency
- ◯ Civil Disturbance

* Choose one.

7 7\. Are there any other hazards that you feel pose a wide-scale threat to your community?

8 8\. Is your home located in a floodplain?*

- ◯ Yes
- ◯ No
- ◯ I don't know

* Choose one.

9 9\. Do you have flood insurance?*

- ◯ Yes
- ◯ No
- ◯ I don't know

* Choose one.

10 10\. If you do not have flood insurance, why not?

- ◯ Not located in floodplain
- ◯ Too expensive
- ◯ Not necessary because it never floods
- ◯ Not necessary because I'm elevated or otherwise protected
- ◯ Never really considered it
- ◯ Other

* Choose one.

11 11\. If "Other," please explain.

12 12\. Have you taken any steps to make your home or neighborhood more resistant to hazards?*

- ◯ Yes
- ◯ No

* Choose one.

13 13\. If "Yes," please explain.

14 14\. Are you interested in making your home or neighborhood more resistant to hazards?*

- ◯ Yes
- ◯ No

* Choose one.

15 15\. Do you know what office to contact to find out more information about how to reduce your risks to hazards in your area?*

- ◯ Yes
- ◯ No

* Choose one.

16 16\. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?*

- ◯ Newspaper
- ◯ Television
- ◯ Radio
- ◯ Internet (Including Social Media)
- ◯ Mail
- ◯ Public Workshops/Meetings
- ◯ School Meetings

* Choose one.

17 17\. Are there any other ways you prefer to receive information? If so, please explain.

18 18\. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

19 19\. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

20 A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. In the next six questions, please tell us how important you think each one is for your community to consider pursuing.

20\. **Prevention** - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

21 21\. **Property Protection** - Actions that involve the modification of existing buildings

to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

22 22\. **Natural Resource Protection** - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest management.*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

23 23\. **Structural Projects - **Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, detention/retention basins, channel modification, retaining walls and storm sewers.*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

24 24\. **Emergency Services -** Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

25 25\. **Public Education and Awareness** - Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials and demonstration events.*

- ◯ Very important
- ◯ Somewhat important
- ◯ Not important

* Choose one.

26 This survey may be submitted anonymously; however, if you provide us with your name and contact information below, we will have the ability to follow up with you to learn more about your ideas or concerns. (Optional)

Thank you for taking the time to answer this survey! Your input is appreciated!

Spanish Translated Cabarrus Stanly Union Regional Hazard Mitigation 2024 Plan Update - Public Survey

¡Necesitamos su ayuda!

Los condados y municipios de Cabarrus, Stanly y Union están trabajando juntos para ser menos vulnerables a los desastres naturales y humanitarios, y su participación en el proceso es importante para nosotros.

Los condados, junto con las jurisdicciones locales y otros socios, están trabajando para actualizar el Plan Regional de Mitigación de Riesgos multi-jurisdiccional. Este plan identifica y evalúa los riesgos de

peligros de nuestra comunidad y identifica estrategias que determinan cómo mejor minimizar o administrar esos riesgos.

Esta encuesta es una oportunidad para que usted comparta sus opiniones y participe en el proceso de planificación de mitigación. La información que proporcione nos ayudará a comprender mejor sus preocupaciones sobre peligros y puede conducir actividades de mitigación que deberían ayudar a disminuir los impactos de futuros eventos peligrosos.

Si tiene alguna pregunta sobre esta encuesta o desea conocer más formas en las que puede participar en el desarrollo del Plan Regional de Mitigación de Riesgos de Cabarrus Stanly Union, comuníquese con Hannah DeLude de ESP Associates, Inc. en hdelude@espassociates.com

1 1\. ¿Dónde vive Ud.?*

- ◯ Condado no incorporado de Cabarrus
- ◯ Condado no incorporado de Union
- ◯ Badin
- ◯ Fairview
- ◯ Hemby Bridge
- ◯ Kannapolis
- ◯ Locust
- ◯ Marvin
- ◯ Mineral Springs
- ◯ Monroe
- ◯ New London
- ◯ Oakboro
- ◯ Richfield
- ◯ Stanfield
- ◯ Waxhaw
- ◯ Condado no incorporado de Stanly
- ◯ Albemarle
- ◯ Concord
- ◯ Harrisburg
- ◯ Indian Trail
- ◯ Lake Park
- ◯ Marshville
- ◯ Midland
- ◯ Misenhiemer
- ◯ Mount Pleasant
- ◯ Norwood
- ◯ Red Cross
- ◯ Stallings
- ◯ Unionville
- ◯ Weddington

- ◯ Wesley Chapel
- ◯ Wingate
- ◯ Otro

2 2\. ¿Alguna vez ha experimentado o se ha visto afectado por algún desastre?*

- ◯ Sí
- ◯ No

3 3\. En caso afirmativo, por favor provea detalles.

Respuesta

4 4\. ¿Cuán preocupado se encuentra por la posibilidad de que nuestra comunidad sufra algún desastre?*

- ◯ Extremadamente preocupado
- ◯ Medianamente preocupado
- ◯ Despreocupado

5 5\. Por favor seleccione el peligro que Ud. crea es la mayor amenaza para su vecindario.*

- ◯ Sequía
- ◯ Huracanes y peligros costeros
- ◯ Clima invernal extremo
- ◯ Inundaciones
- ◯ Incendios forestales
- ◯ Sustancias peligrosas / tóxicas
- ◯ Terrorismo
- ◯ Pulsos electromagnéticos
- ◯ Disturbios civiles
- ◯ Calor excesivo
- ◯ Tornados / tormentas eléctricas
- ◯ Fallas de represas
- ◯ Terremotos
- ◯ Enfermedades infecciosas
- ◯ Emergencias radiológicas
- ◯ Amenazas cibernéticas
- ◯ Emergencias alimentícias

6 6\. Por favor seleccione el peligro que Ud. crea es la segunda mayor amenaza más importante para su vecindario*

- ◯ Sequía
- ◯ Huracanes y peligros costeros
- ◯ Clima invernal extremo
- ◯ Inundaciones
- ◯ Incendios forestales
- ◯ Sustancias peligrosas / tóxicas
- ◯ Terrorismo
- ◯ Pulsos electromagnéticos
- ◯ Disturbios civiles
- ◯ Calor excesivo
- ◯ Tornados / tormentas eléctricas
- ◯ Fallas de represas
- ◯ Terremotos
- ◯ Enfermedades infecciosas
- ◯ Emergencias radiológicas
- ◯ Amenazas cibernéticas
- ◯ Emergencias alimentícias

7 7\. ¿Existen otros peligros que Ud. crea representen una amenaza a gran escala para su comunidad?

Respuesta

8 8\. ¿Su casa está ubicada en una llanura aluvial?*

- ◯ Sí
- ◯ No
- ◯ Desconozco

9 9\. ¿Tiene Ud. seguro contra inundaciones?*

- ◯ Sí
- ◯ No
- ◯ Desconozco

10 10\. Si no tiene seguro contra inundaciones, ¿a qué se debe?

- ◯ La propiedad no está ubicada en una llanura aluvial
- ◯ Demasiado caro
- ◯ No es necesario porque la propiedad nunca se inunda
- ◯ No es necesario porque la propiedad está elevada o protegida de alguna manera
- ◯ No lo analicé en detalle
- ◯ Otro motivo

11 11\. Si la respuesta es “otro motivo”, por favor provea detalles.

Respuesta

12 12\. ¿Ha tomado alguna medida para que su hogar o su vecindario sean más resistentes a los peligros?*

- ◯ Sí
- ◯ No

13 13\. En caso afirmativo, por favor provea detalles.

Respuesta

14 14\. ¿Le interesaría tomar alguna medida para que su hogar o su vecindario sean más resistentes a los peligros?*

- ◯ Sí
- ◯ No

15 15\. ¿Sabe a qué oficina debe contactar para obtener más información sobre cómo reducir los riesgos en su área?*

- ◯ Sí
- ◯ No

16 16\. ¿Cuál es la forma más efectiva para que usted reciba información sobre cómo hacer que su hogar y su vecindario sean más resistentes a los peligros?*

- ◯ Periódico
- ◯ Televisión

- ◯ Radio
- ◯ Internet (incluidas las redes sociales)
- ◯ Correo
- ◯ Talleres/reuniones públicas
- ◯ Reuniones escolares

17 17\. ¿Hay otras formas en las que prefiere recibir información? Si es así, por favor provea detalles.

Respuesta

18 18\. En su opinión, ¿cuáles son algunas medidas que su gobierno local podría tomar para reducir o eliminar en el future el riesgo de daños en su vecindario?

Respuesta

19 19\. ¿Hay otras cuestiones relacionadas a la reducción del riesgo y las pérdidas asociadas con peligros o desastres en la comunidad que Ud. considere importantes?

Respuesta

20 Existen una serie de actividades comunitarias que pueden reducir nuestro riesgo. Estas actividades se suelen clasificar en una de seis categorías amplias. En las siguientes seis preguntas, díganos cuán importante cree que es cada una de ellas a fin

de que su comunidad evalúe su implementación.

20\. Prevención - Acciones administrativas o regulatorias relacionadas a la forma en que se desarrollan los terrenos y se construyen los edificios. Por ejemplo: planificación y zonificación, códigos de construcción, preservación de espacios abiertos y regulación de llanuras aluviales.*

- ◯ Muy importante
- ◯ Medianamente importante
- ◯ No importante

21 21\. Protección de la propiedad - acciones relacionadas a la modificación de edificios existentes para protegerlos de peligro o su remoción del área de peligro. Por ejemplo: adquisición, reubicación, elevación, modernizaciones estructurales y contraventanas contra tormentas.*

- ◯ Muy importante
- ◯ Medianamente importante
- ◯ No importante

22 22\. Protección de recursos naturales - Acciones que, además de minimizar las pérdidas por peligros, también preservan o restauran las funciones de los sistemas naturales. Por ejemplo: protección de llanuras aluviales, preservación de hábitats, estabilización de pendientes, zonas de amortiguamiento ribereñas y gestión forestal.*

- ◯ Muy importante
- ◯ Medianamente importante
- ◯ No importante

23 23\. Proyectos estructurales: Acciones destinadas a disminuir el impacto de un peligro modificando la progresión natural del mismo. Por ejemplo: represas, diques, cuencas de detención/retención, modificación de canales, muros de contención y alcantarillas pluviales.*

- ◯ Muy importante
- ◯ Medianamente importante
- ◯ No importante

24 24\. Servicios de emergencia: acciones que protegen a las personas y las propiedades durante e inmediatamente después de un evento peligroso. Por ejemplo: sistemas de alerta, planificación de evacuación, capacitación en respuesta a emergencias y protección de instalaciones o sistemas de emergencia críticos.*

- ◯ Muy importante
- ◯ Medianamente importante
- ◯ No importante

25 25\. Educación y concientización pública - Acciones para informar a los ciudadanos sobre los peligros y las técnicas que pueden utilizar para protegerse a sí mismos y a sus bienes. Por ejemplo: proyectos de extensión, programas de educación escolar, materiales de biblioteca y eventos de demostración.*

- ◯ Muy importante
- ◯ Medianamente importante
- ◯ No importante

26 26\. Esta encuesta puede enviarse de forma anónima. Sin embargo, si nos proporciona su nombre e información de contacto a continuación, podremos comunicarnos con usted para obtener más información sobre sus ideas o inquietudes. (opcional)

Respuesta

¡Gracias!

Local Capability Assessment Survey

Jurisdiction/Agency: _____ **Phone:** _____

Point of Contact: _____ **E-mail:** _____

1. PLANNING AND REGULATORY CAPABILITY - Please indicate whether the following planning or regulatory tools (plans, ordinances, codes or programs) are currently in place or under development for your jurisdiction by placing an "**X**" in the appropriate box. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Strongly Supports, Helps Facilitate or Hinders) with another "**X**". Finally, please provide additional comments or explanations in the space provided or with attachments.

Planning / Regulatory Tool	In Place	Under Development	Department / Agency Responsible	Effect on Loss Reduction			Comments
				Strongly Supports	Helps Facilitate	Hinders	
Hazard Mitigation Plan							
Comprehensive Land Use Plan (or General, Master or Growth Mgt. Plan)							
Floodplain Management Plan							
Open Space Management Plan (or Parks & Rec./ Greenways Plan)							
Stormwater Management Plan / Ordinance							
Natural Resource Protection Plan							
Flood Response Plan							
Emergency Operations Plan							
Continuity of Operations Plan							
Evacuation Plan							
Other Plans (please explain under Comments)							

Local Capability Assessment Survey

Planning / Regulatory Tool	In Place	Under Development	Department / Agency Responsible	Effect on Loss Reduction			Comments
				Strongly Supports	Facilitates	Hinders	
Disaster Recovery Plan							
Capital Improvements Plan							
Economic Development Plan							
Historic Preservation Plan							
Floodplain Ordinance (or Flood Damage Prevention Ordinance)							
Zoning Ordinance							
Subdivision Ordinance							
Unified Development Ordinance							
Post-disaster Redevelopment / Reconstruction Ordinance							
Building Code							
Fire Code							
National Flood Insurance Program (NFIP)							
NFIP Community Rating System (CRS Program)							

Local Capability Assessment Survey

2. ADMINISTRATIVE AND TECHNICAL CAPABILITY - Please indicate whether your jurisdiction maintains the following staff members within its current personnel resources by placing an "**X**" in the appropriate box . Then, if YES, please identify the department or agency they work under and provide any other comments you may have in the space provided or with attachments.

Staff / Personnel Resources	Yes	No	Department / Agency	Comments
Planners with knowledge of land development and land management practices				
Engineers or professionals trained in construction practices related to buildings and/or infrastructure				
Planners or engineers with an understanding of natural and/or human-caused hazards				
Emergency manager				
Floodplain manager				
Land surveyors				
Scientist familiar with the hazards of the community				
Staff with education or expertise to assess the community's vulnerability to hazards				
Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program				
Resource development staff or grant writers				

Local Capability Assessment Survey

3. FISCAL CAPABILITY - Please indicate whether your jurisdiction has access to or is eligible to use the following local financial resources ***for hazard mitigation purposes*** (including as match funds for State of Federal mitigation grant funds). Then, identify the primary department or agency responsible for its administration or allocation and provide any other comments you may have in the space provided or with attachments.

Financial Resources	Yes	No	Department / Agency	Comments
Capital Improvement Programming				
Community Development Block Grants (CDBG)				
Special Purpose Taxes (or taxing districts)				
Gas / Electric Utility Fees				
Water / Sewer Fees				
Stormwater Utility Fees				
Development Impact Fees				
General Obligation, Revenue and/or Special Tax Bonds				
Partnering arrangements or intergovernmental agreements				
Other: _____				

4. POLITICAL CAPABILITY - Political capability can be generally measured by the degree to which local political leadership is willing to enact policies and programs that reduce hazard vulnerabilities in your community, even if met with some opposition. Examples may include guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum State or Federal requirements (e.g., building codes, floodplain management, etc.). Please identify some general examples of these efforts if available and/or reference where more documentation can be found.

Local Capability Assessment Survey

5. SELF-ASSESSMENT OF CAPABILITY - Please provide an approximate measure of your jurisdiction's capability to effectively implement hazard mitigation strategies to reduce hazard vulnerabilities. Using the following table, please place an "**X**" in the box marking the most appropriate degree of capability (Limited, Moderate or High) based upon best available information and the responses provided in Sections 1-4 of this survey.

	DEGREE OF CAPABILITY		
	LIMITED	**MODERATE**	**HIGH**
Planning and Regulatory Capability			
Administrative and Technical Capability			
Fiscal Capability			
Political Capability			
OVERALL CAPABILITY			

Points System for Capability Ranking

0-19 points = Limited overall capability
20-39 points = Moderate overall capability
40-68 points = High overall capability

I. Planning and Regulatory Capability
(Up to 43 points)

Yes = 3 points
Under Development = 1 point
Included under County plan/code/ordinance/program = 1 point
No = 0 points

- Hazard Mitigation Plan
- Comprehensive Land Use Plan
- Floodplain Management Plan
- National Flood Insurance Program
- NFIP Community Rating System

Yes = 2 points
Under Development = 1 point
Included under County plan/code/ordinance/program = 1 point
No = 0 points

- Open Space Management Plan / Parks & Recreation Plan
- Stormwater Management Plan
- Natural Resource Protection Plan
- Flood Response Plan
- Emergency Operations Plan
- Continuity of Operations Plan
- Evacuation Plan
- Disaster Recovery Plan
- Flood Damage Prevention Ordinance
- Post-disaster Redevelopment / Reconstruction Ordinance

Yes = 1 point
No = 0 points

- Capital Improvements Plan
- Economic Development Plan
- Historic Preservation Plan
- Zoning Ordinance
- Subdivision Ordinance
- Unified Development Ordinance
- Building Code
- Fire Code

II. Administrative and Technical Capability
(Up to 15 points)

Yes = 2 points
Service provided by County = 1 point
No = 0 points

- Planners with knowledge of land development and land management practices
- Engineers or professionals trained in construction practices related to buildings and/or infrastructure
- Planners or engineers with an understanding of natural and/or human-caused hazards
- Emergency manager
- Floodplain manager

Yes = 1 point
No = 0 points

- Land surveyors
- Scientist familiar with the hazards of the community
- Staff with education or expertise to assess the community's vulnerability to hazards
- Personnel skilled in Geographical Information Systems (GIS) and/or Hazus
- Resource development staff or grant writers

III. Fiscal Capability
(Up to 10 points)

Yes = 1 point
No = 0 points

- Capital Improvement Programming
- Community Development Block Grants (CDBG)
- Special Purpose Taxes (or tax districts)
- Gas / Electric Utility Fees
- Water / Sewer Fees
- Stormwater Utility Fees
- Development Impact Fees
- General Obligation / Revenue / Special Tax Bonds
- Partnering arrangements or intergovernmental agreements
- Other

Appendix C
Local Mitigation Plan Review Tool

This section of the Plan includes a completed Local Mitigation Plan Review Tool.

Local Mitigation Plan Review Tool

Cover Page

The Local Mitigation Plan Review Tool (PRT) demonstrates how the local mitigation plan meets the regulation in 44 CFR § 201.6 and offers states and FEMA Mitigation Planners an opportunity to provide feedback to the local governments, including special districts.

1. The Multi-Jurisdictional Summary Sheet is a worksheet that is used to document how each jurisdiction met the requirements of the plan elements (Planning Process; Risk Assessment; Mitigation Strategy; Plan Maintenance; Plan Update; and Plan Adoption).
2. The Plan Review Checklist summarizes FEMA's evaluation of whether the plan has addressed all requirements.

For greater clarification of the elements in the Plan Review Checklist, please see Section 4 of this guide. Definitions of the terms and phrases used in the PRT can be found in Appendix E of this guide.

Plan Information	
Jurisdiction(s)	**Cabarrus County** (Concord, Harrisburg, Kannapolis, Midland, Mount Pleasant), **Stanly County** (Albemarle, Badin, Locust, Misenheimer, New London, Norwood, Oakboro, Red Cross, Richfield, Stanfield), **Union County** (Fairview, Hemby Bridge, Indian Trail, Lake Park, Marshville, Marvin, Mineral Springs, Monroe, Stallings, Unionville, Waxhaw, Weddington, Wesley Chapel, Wingate).
Title of Plan	Cabarrus Stanly Union, Regional Hazard Mitigation Plan
New Plan or Update	Update
Single- or Multi-Jurisdiction	Multi-jurisdiction
Date of Plan	12/31/2024
Local Point of Contact	
Title	Nathan Slaughter, Hazard Mitigation Department Manager
Agency	ESP Associates, Inc.
Address	2200 Gateway Centre Blvd., Suite 216, Morrisville, NC 27560
Phone Number	919678-1070
Email	nslaughter@espassociates.com

Additional Point of Contact	
Title	Click or tap here to enter text.
Agency	Click or tap here to enter text.
Address	Click or tap here to enter text.
Phone Number	
Email	Click or tap here to enter text.

Review Information	
State Review	
State Reviewer(s) and Title	Carl Baker, Hazard Mitigation Planner
State Review Date	1/9/2025
FEMA Review	
FEMA Reviewer(s) and Title	Click or tap here to enter text.
Date Received in FEMA Region	Click or tap to enter a date.
Plan Not Approved	Click or tap to enter a date.
Plan Approvable Pending Adoption	Click or tap to enter a date.
Plan Approved	Click or tap to enter a date.

Multi-Jurisdictional Summary Sheet

In the boxes for each element, mark if the element is met (Y) or not met (N).

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. HHPD Requirements	H. State Requirements
1	**Cabarrus County**								
2	Concord								
3	Harrisburg								
4	Kannapolis								
5	Midland								
6	Mount Pleasant								
7	**Stanly County**								
8	Albemarle								
9	Badin								
10	Locust								
11	Misenheimer								
12	New London								
13	Norwood								
14	Oakboro								
15	Red Cross								
16	Richfield								
17	Stanfield								

#	Jurisdiction Name	A. Planning Process	B. Risk Assessment	C. Mitigation Strategy	D. Plan Maintenance	E. Plan Update	F. Plan Adoption	G. HHPD Requirements	H. State Requirements
18	Union County								
19	Fairview								
20	Hemby Bridge								
21	Indian Trail								
22	Lake Park								
23	Marshville								
24	Marvin								
25	Mineral Springs								
26	Monroe								
27	Stallings								
28	Unionville								
29	Waxhaw								
30	Weddington								
31	Wesley Chapel								
32	Wingate								

Plan Review Checklist

The Plan Review Checklist is completed by FEMA. States and local governments are encouraged, but not required, to use the PRT as a checklist to ensure all requirements have been met prior to submitting the plan for review and approval. The purpose of the checklist is to identify the location of relevant or applicable content in the plan by element/sub-element and to determine if each requirement has been "met" or "not met." FEMA completes the "required revisions" summary at the bottom of each element to clearly explain the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is "not met." Sub-elements in each summary should be referenced using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each element and sub-element are described in detail in Section 4: Local Plan Requirements of this guide.

Plan updates must include information from the current planning process.

If some elements of the plan do not require an update, due to minimal or no changes between updates, the plan must document the reasons for that.

Multi-jurisdictional elements must cover information unique to all participating jurisdictions.

Element A: Planning Process

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))	**Section 2: 2.4 CSU HMPC** **2.6 Involving the Public** **2.7 Involving the Stakeholders**	
A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan's development, as well as who was involved?	Section 2: 2.3 Updating the Plan 2.4 CSU HMPC 2.5 Community Meetings and Workshops 2.6 Involving the Public 2.7 Involving the Stakeholders	

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?	Section 2: 2.2 History of Hazard Mitigation Planning in the CSU Region 2.3 Updating the Plan 2.4 CSU HMPC 2.5 Community Meetings and Workshops 2.6 Involving the Public 2.7 Involving the Stakeholders	
A2. Does the plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development as well as businesses, academia, and other private and non-profit interests to be involved in the planning process? (Requirement 44 CFR § 201.6(b)(2))	**Section 2: 2.7 Involving the Stakeholders**	
A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?	Section 2: 2.7 Involving the Stakeholders	Choose an item.
A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))	**2.5 Community Meetings and Workshops** **2.6 Involving the Public**	
A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?	2.6 Involving the Public	Choose an item.

Element A Requirements	Location in Plan (section and/or page number)	Met / Not Met
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))	**7.2 Conducting the Capability Assessment and throughout Section 7**	
A4-a. Does the plan document what existing plans, studies, reports and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document?	7.2 Conducting the Capability Assessment and throughout Section 7.	Choose an item.

ELEMENT A REQUIRED REVISIONS
NCEM 1st Review: A1: No revisions required. A2: Neighboring communities are addressed in Appendix D, page 565. No revisions required. A3: Documentation of public meetings must be documented. ESP Response: Public meeting documented. A4: No revisions required.

Element B: Risk Assessment

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))	**Section 4 and 5 throughout**	
B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the planning area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?	4.4 Hazard Evaluation	Choose an item.

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1-b. Does the plan include information on the **location** of each identified hazard?	• **Drought** – 5.3.2 • **Excessive Heat** - 5.4.2 • **Hurricane & Coastal** – 5.5.2 • **Tornadoes/Thunderstorms** – 5.6.2 • **Severe Winter Weather** – 5.7.2 • **Earthquakes** – 5.8.2 • **Geological** – 5.9.2 • **Dam Failure** – 5.10.2 • **Flooding** – 5.11.2 • **Wildfires** – 5.12.2 • **Infectious Disease** – 5.13.2 • **Hazardous Substances** – 5.14.2 • **Radiological Emergency** – 5.15.2 • **Terrorism** – 5.16.2 • **Cyber** – 5.17.2 • **Electromagnetic Pulse** – 5.18.2 • **Civil Disturbance** – 5.19.2 • **Food Emergency** – 5.20.2	Choose an item.

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1-c. Does the plan describe the extent for each identified hazard?	• Drought – 5.3.2 • Excessive Heat - 5.4.2 • Hurricane & Coastal – 5.5.2 • Tornadoes/Thunderstorms – 5.6.2 • Severe Winter Weather – 5.7.2 • Earthquakes – 5.8.2 • Geological – 5.9.2 • Dam Failure – 5.10.2 • Flooding – 5.11.2 • Wildfires – 5.12.2 • Infectious Disease – 5.13.2 • Hazardous Substances – 5.14.2 • Radiological Emergency – 5.15.2 • Terrorism – 5.16.2 • Cyber – 5.17.2 • Electromagnetic Pulse – 5.18.2 • Civil Disturbance – 5.19.2 • Food Emergency – 5.20.2 5.21.1 Hazard Extent Table	Choose an item.

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1-d. Does the plan include the history of previous hazard events for each identified hazard?	• Drought – 5.3.3 • Excessive Heat - 5.4.3 • Hurricane & Coastal – 5.5.3 • Tornadoes/Thunderstorms – 5.6.3 • Severe Winter Weather – 5.7.3 • Earthquakes – 5.8.3 • Geological – 5.9.3 • Dam Failure – 5.10.3 • Flooding – 5.11.3, 5.11.4, 5.11.5 • Wildfires – 5.12.3 • Infectious Disease – 5.13.3 • Hazardous Substances – 5.14.3 • Radiological Emergency – 5.15.3 • Terrorism – 5.16.3 • Cyber – 5.17.3 • Electromagnetic Pulse – 5.18.3 • Civil Disturbance – 5.19.3 • Food Emergency – 5.20.3	Choose an item.

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B1-e. Does the plan include the probability of future events for each identified hazard? Does the plan describe the effects of future conditions, including climate change (e.g., long-term weather patterns, average temperature and sea levels), on the type, location and range of anticipated intensities of identified hazards?	• Drought – 5.3.4 • Excessive Heat - 5.4.4 • Hurricane & Coastal – 5.5.4 • Tornadoes/Thunderstorms – 5.6.4 • Severe Winter Weather – 5.7.4 • Earthquakes – 5.8.4 • Geological – 5.9.4 • Dam Failure – 5.10.4 • Flooding – 5.11.6 • Wildfires – 5.12.4 • Infectious Disease – 5.13.4 • Hazardous Substances – 5.14.4 • Radiological Emergency – 5.15.4 • Terrorism – 5.16.4 • Cyber – 5.17.4 • Electromagnetic Pulse – 5.18.4 • Civil Disturbance – 5.19.4 • Food Emergency – 5.20.4	Choose an item.
B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area?	Appendices F and G show municipal level flood and wildfire risk.	Choose an item.

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B2. Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))		
B2-a. Does the plan provide an overall summary of each jurisdiction's vulnerability to the identified hazards?	• **Hurricane & Coastal** – 6.5.1 • **Tornadoes/Thunderstorms** – 6.5.2 • **Earthquakes** – 6.5.3 • **Geological** – 6.5.4 • **Flooding** – 6.5.5 • **Wildfires** – 6.5.6 • **Hazardous Substances** – 6.5.7 • **Dam Failure** – 6.5.8 • **Overall Risk Ratings, EAL, Risk Scores** – Table 5.37 (Section 5.21); Table 6.26 (Section 6.6)	Choose an item.

Element B Requirements	Location in Plan (section and/or page number)	Met / Not Met
B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction?	• **Drought** – 5.3.5 • **Excessive Heat** - 5.4.5 • **Hurricane & Coastal** – 5.5.5, 6.5.1 • **Tornadoes/Thunderstorms** – 5.6.5, 6.5.2 • **Severe Winter Weather** – 5.7.5 • **Earthquakes** – 5.8.5, 6.5.3 • **Geological** – 5.9.5, 6.5.4 • **Dam Failure** – 5.10.5, 6.5.8 • **Flooding** – 5.11.7, 6.5.5 • **Wildfires** – 5.12.5, 6.5.6 • **Infectious Disease** – 5.13.5 • **Hazardous Substances** – 5.14.5, 6.5.7 • **Radiological Emergency** – 5.15.5 • **Terrorism** – 5.16.5 • **Cyber** – 5.17.5 • **Electromagnetic Pulse** – 5.18.5 • **Civil Disturbance** – 5.19.5 • **Food Emergency** – 5.20.5 • **Overall Risk Ratings, EAL, Risk Scores** – Table 5.37 (Section 5.21); Table 6.26 (Section 6.6)	Choose an item.
B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?	Table 5.30, Section 5.11.5 PDF Page 110	Choose an item.

ELEMENT B REQUIRED REVISIONS
NCEM 1st Review: B1: No revisions required. B2: No revisions required.

Element C: Mitigation Strategy

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C1. Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))		
C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?	Section 7: Capability Assessment – entire section	Choose an item.
C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?	Section 7: Capability Assessment – entire section	Choose an item.
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))	**Section 7: 7.3.4, pages 7:9-7:15; Table 7.2 NFIP Policy and Information**	
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?	Section 7: 7.3.4, pages 7:9-7:15; Table 7.2 NFIP Policy and Information PDF Pages 240-245	Choose an item.
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))	**Section 8.2, pages 8:3 and 8:4**	
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?	Section 8.2, pages 8:3 and 8:4 PDF Pages 254-255	Choose an item.

Element C Requirements	Location in Plan (section and/or page number)	Met / Not Met
C4. Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement 44 CFR § 201.6(c)(3)(ii))	**Section 8 and 9 throughout.**	
C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?	Section 8 and 9 throughout.	Choose an item.
C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan's risk assessment?	Section 9 throughout.	Choose an item.
C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	**Section 8 and 9 throughout.**	
C5-a. Does the plan describe the criteria used for prioritizing actions?	Section 8, Section 8.1.1 pages 8:2 and 8:3. PDF Page 252-255	Choose an item.
C5-b. Does the plan provide the position, office, department or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame?	Section 9 throughout	Choose an item.

ELEMENT C REQUIRED REVISIONS
NCEM 1st Review: C1: No revisions required. C2: No revisions required. C3: No revisions required. C4: The Town of Mount Pleasant (PDF Page 290 and 292) lists the hazards addressed on three mitigation actions as "Multiple". The action must list each hazard addressed individually, or list "All Hazards". The Town of Indian Trail and Marvin list the hazard addressed as Erosion. The risk assessment lists erosion as a subcategory under the Geological hazard. See how the hazard is addressed by the Town of Stallings (PDF Page 337). The Town of Marvin is inconsistent in listing the hazard addressed, "Flooding" vs. "Flood". ESP Response: All revisions above addressed. C5: No revisions required.

Element D: Plan Maintenance

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))	**Section 10, 10.3 page 10:5**	
D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?	Section 10, 10.3 page 10:5 PDF Page 351	Choose an item.
D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))	**Section 10, 10.2, pages 10:2 through 10:4**	
D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?	Section 10, 10.2, pages 10:2 through 10:5 PDF Page 348-351	Choose an item.

Element D Requirements	Location in Plan (section and/or page number)	Met / Not Met
D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.	Section 10, 10.2, pages 10:2 through 10:5 PDF Page 348-351	Choose an item.
D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?	Section 10, 10.2, pages 10:2 through 10:5 PDF Page 348-351	Choose an item.
D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))	**Section 10, 10.1, pages 10:1 through 10:2**	
D3-a. Does the plan describe the process the community will follow to integrate the ideas, information and strategy of the mitigation plan into other planning mechanisms?	Section 10, 10.1, pages 10:1 through 10:2 PDF Page 347-348	Choose an item.
D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?	Section 10, 10.1, pages 10:1 through 10:2 PDF Page 347-348	Choose an item.
D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms?	Section 10, 10.1, pages 10:1 through 10:2 PDF Page 347-348	Choose an item.

ELEMENT D REQUIRED REVISIONS

NCEM 1st Review:

D1: No revisions required.

D2: No revisions required.

D3: No revisions required.

Element E: Plan Update

Element E Requirements	Location in Plan (section and/or page number)	Met / Not Met
E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))		
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?	Section 3.3.3 Land Use	Choose an item.
E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))	**Section 9 (entire Section) and Appendix E (entire Appendix)**	
E2-a. Does the plan describe how it was revised due to changes in community priorities?	Section 8: 8.5 (Page 8:6)	Choose an item.
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?	Section 9 (entire Section)	Choose an item.
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?	Section 10: 10.1 (pages 10:1 and 10-:2), Section 9 throughout and Appendix E throughout	Choose an item.

ELEMENT E REQUIRED REVISIONS
NCEM 1st Review: E1: No revisions required. E2: No revisions required.

Element F: Plan Adoption

Element F Requirements	Location in Plan (section and/or page number)	Met / Not Met
F1. For single-jurisdictional plans, has the governing body of the jurisdiction formally adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F1-a. Does the participant include documentation of adoption?		Choose an item.
F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))		
F2-a. Did each participant adopt the plan and provide documentation of that adoption?		Choose an item.
ELEMENT F REQUIRED REVISIONS		
Required Revision**:**		

Element G: High Hazard Potential Dams (Optional)

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD1. Did the plan describe the incorporation of existing plans, studies, reports and technical information for HHPDs?		
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?		Choose an item.
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?		Choose an item.

HHPD Requirements	Location in Plan (section and/or page number)	Met / Not Met
HHPD2. Did the plan address HHPDs in the risk assessment?		
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?		Choose an item.
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?		Choose an item.
HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?		
HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?		Choose an item.
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?		Choose an item.
HHPD4-a. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?		
HHPD4-a. Does the plan describe specific actions to address HHPDs?		Choose an item.
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?		Choose an item.
HHPD4-c. Does the plan identify the position, office, department or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?		Choose an item.
HHPD Required Revisions		
NCEM 1st Review: N/A		

Plan Assessment

These comments can be used to help guide your annual/regularly scheduled updates and the next plan update.

Element A. Planning Process

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element B. Risk Assessment

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element C. Mitigation Strategy

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element D. Plan Maintenance

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element E. Plan Update

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element G. HHPD Requirements (Optional)

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Element H. Additional State Requirements (Optional)

Strengths

- [insert comments]

Opportunities for Improvement

- [insert comments]

Appendix D
Planning Process Documentation

This section of the Plan includes the following five (5) categories of items:

1. *CSU Regional Hazard Mitigation Planning Committee Meeting Agendas*
2. *CSU Regional Hazard Mitigation Planning Committee Meeting Sign-in Sheets*
3. *CSU Regional Hazard Mitigation Planning Committee Meeting Minutes*
4. *Neighboring Jurisdiction Outreach Documentation*
5. *Public Survey Summary Results*

Email Correspondence

Hi All,

I hope this message finds you well.

I am reaching out to inform you that Cabarrus, Stanly, Union Counties are currently in the process of updating our regional hazard mitigation plan. As part of this important initiative, we would like to extend an invitation to neighboring jurisdictions to participate in the planning process.

We believe that collaboration is vital for effective hazard mitigation, and your insights and contributions would be invaluable to our efforts. Our team has created a project website, which you can access here: Cabarrus Stanly Union Hazard Mitigation Plan Update. This site contains important information about the project and ongoing updates.

Additionally, we will be hosting a public meeting to review the draft plan, and to facilitate your involvement, we encourage your attendance. Details regarding the date and time of this virtual meeting will be shared soon.

Thank you for considering this opportunity to collaborate on enhancing our regional resilience. We look forward to your participation and support.

Kind regards,

Nathan Slaughter, AICP, CFM

Outside Stakeholder Contacts

Agency	Name	Title	Email
Neighboring Jurisdictions			
Rowan County	Allen Cress	Emergency Services Chief	allen.cress@rowncountync.gov
Iredell County	Jody Smyre	EM Coordinator	jsmyre@co.iredell.nc.us
Iredell County	Kathy Wolfe	Floodplain Management	kwolfe@co.iredell.nc.us
Mecklenburg County	Robert Graham	Emergency Manager	rgraham@ci.charlotte.nc.us
Davidson County	Alton Hanes	Emergency Services Director	alton.hanes@davidsoncountync.gov
Anson County	Rodney Diggs	Fire Marshal	rdiggs@co.anson.nc.us
Richmond County	Bob Smith	Emergency Services Director	bob.smith@richmondnc.com
Montgomery County	Robbie Smith	EM Coordinator	robbie.smith@montgomerycountync.com
Lancaster County	Darren Player	Fire Rescue/EM Director	dplayer@lancastercountysc.net
Chesterfield County	Harold Hainey	EM Director	hhainey@chesterfieldcountysc.com
Marlboro County	Steve Akers	EM/E911 Director	s.akers@marlborocounty.sc.gov
Others			
Kannapolis City Schools	Kevin Garay	Superintendent	kevin.garay@kcs.k12.nc.us
Cabarrus County Schools	Dr. John Kopicki	Superintendent	superintendent@cabarrus.k12.nc.us
Celgard LLC	-	-	General Inquiry Form Online

Meeting Participant Overview

NAME	DEPARTMENT / AGENCY / TITLE	Attended Internal Kickoff Meeting 2/8/24	Attended Stakeholder Kickoff Meeting 3/13/24	Attended HIRA Mitigation Meeting 7/11/24	Attended Public Meeting 2/11/25
Cabarrus County and Municipalities					
Ashley, Kevin	City of Concord, Deputy Planning Director		X	X	
Barnhardt, Travis	City of Kannapolis, Fire Department			X	
Boyd, Robbie	City of Concord, Fire Department Battalion Chief		X	X	
Bradley, Jon	Cabarrus County, Risk and Safety Director		X	X	
Burnett, Jason	Cabarrus County, Director of Emergency Management		X	X	X
Case, Joshua	Town of Midland, Deputy Fire Chief		X		
Childers, Braylee	Cabarrus Health Alliance, ARPA Workforce Development Program Coordinator			X	
Cook, Timothy	City of Kannapolis, Fire Department			X	
Council, Joselyn	City of Kannapolis, Civil Engineering & Planning Intern			X	
Crane, Ian	City of Concord, Emergency Management Division Chief		X	X	X
Daly, Aubrey	Cabarrus Health Alliance, Public Health Policy Associate			X	
Deal, Jackie	City of Concord, Engineering Director			X	
Ennis, Ashleigh	Cabarrus County, Assistant Fire Marshal				X
Eury, Keith	City of Concord, Police Department			X	
Foxx, Robbie	Cabarrus County, Deputy Chief Codes Enforcement Officer			X	
Graham, Phillip	City of Concord, Transportation Director			X	
Grant, Kevin	Cabarrus County, Environmental Management Director		X	X	
Gustafson, Dawn	Cabarrus County, Emergency Management Planner	X	X	X	X
Harris, Rodney	Cabarrus County, CMO		X		
Hatley, Jennifer	Cabarrus Health Alliance, Environmental Health Director			X	
Howden, James	Cabarrus County, Finance Director		X		
Love, Matt	Cabarrus County, Director of Construction Standards		X	X	
Lunsford-Key, Tamara	Cabarrus Health Alliance, Communicable Disease Program Director			X	
McCarty, Elizabeth	City of Kannapolis, Assistant Planning Director			X	
Miesenheimer, Marcus	Cabarrus Health Alliance, Public Health Nurse			X	
Mills, Tim	Town of Midland, Fire Service Professional				X

CSU MEETING PARTICIPANTS AND SIGN-IN SHEETS

NAME	DEPARTMENT / AGENCY / TITLE	Attended Internal Kickoff Meeting 2/8/24	Attended Stakeholder Kickoff Meeting 3/13/24	Attended HIRA Mitigation Meeting 7/11/24	Attended Public Meeting 2/11/25
Morris, Susie	Cabarrus County, Planning Director & Floodplain Administrator		X		
Obiechefu, Udoku	Cabarrus Health Alliance, Epidemiologist			X	
Potoczny, Amy	Cabarrus Health Alliance, Public Health Preparedness Coordinator		X	X	X
Plemmons, Kevin	City of Concord, Deputy Director of Water Resources			X	
Roberts, Sam	Cabarrus County, AUXComm		X	X	X
Sellin, Mark	Cabarrus County, LEP/Civil Air Patrol		X	X	
Sells, Jim	Town of Mount Pleasant, Emergency Mgmt Planner		X	X	X
Sifford, Kelly	Cabarrus County, Assistant County Manager			X	
Thomas, Craig	Town of Midland, Planning Director		X	X	
Whitehurst, Cole	Cabarrus County, Emergency Management Planner			X	X
Stanly County and Municipalities					
Allen, Ray	Town of Norwood, Town Administrator		X		
Almond, Jay	Town of Badin, Town Manager		X		
Harvey, Georgia	Town of Oakboro, Town Administrator		X		
Rhodes, Darren	City of Albemarle, Assistant City Manager			X	
Roark, Michael	Stanly County, Emergency Management Director/Fire Marshal	X	X	X	X
Union County and Municipalities					
Amos, Christina	Village of Marvin, Village Manager		X		
Ansley, Andrew	Union County, Emergency Management Director	X	X	X	X
Arant, Tiffany	Union County, Grants Specialist	X	X	X	
Becker, Rick	Town of Mineral Springs, Mayor		X		
Boyack, Scott	Union County, Assistance Emergency Management Coordinator		X	X	
Brooks, Vicky	Town of Mineral Springs, Planning Director & Clerk		X		
Broom, Davy	Village of Marvin, Public Works Director		X	X	
Campo, Teresa	City of Monroe, Community Development Manager			X	
D'Allesandro, Donna	Union County, Training & Development Coordinator			X	
Dewey, Karen	Town of Weddington, Town Administrator & Clerk		X	X	
Drye, Chad	Town of Wingate, Police Department Captain		X	X	
Gurian, Jason	Union County, Public Health Preparedness Coordinator			X	
Jenson, Lee	Union County, Planning Director				

CSU MEETING PARTICIPANTS AND SIGN-IN SHEETS

NAME	DEPARTMENT / AGENCY / TITLE	Attended Internal Kickoff Meeting 2/8/24	Attended Stakeholder Kickoff Meeting 3/13/24	Attended HIRA Mitigation Meeting 7/11/24	Attended Public Meeting 2/11/25
Kindley, Bryan	City of Monroe, Fire Administration Deputy Chief		X		
Liersaph, Chris	Union County, IT Assistant Director			X	
McFadden, Bryan	Union County, GIS Manager			X	
Mumpower, Amy	Village of Wesley Chapel, Deputy Clerk			X	
Scheirer, Sara	Union County, Local Disaster Recovery Manager	X	X	X	
Seamon, Will	Union County, Assistant Emergency Management Coordinator		X		
Starnes, Kevin	Town of Waxhaw, Fire Marshal			X	
Wells, Jeff	Town of Waxhaw, Town Manager & Planning Director		X		
Other Stakeholders					
Baker, Carl	NCEM, Hazard Mitigation Planner	X	X		
Bolden, Barbara	-				X
Cannon, Will	American Red Cross, Disaster Program Manager		X		
Corriher, Ashtyn	Corning Inc., Public Health Nurse				X
Crapster, Joe	Duke Energy, District Manager			X	
Crew, Chris	NCEM, State Hazard Mitigation Officer	X	X		
Del Rio, Janice	Corning Inc., Environmental Engineer		X	X	
DeLude, Hannah	ESP Associates, Hazard Mitigation Planner	X	X	X	X
Ennis, Dylan	Rimertown, Fire Service				X
Flores, John	ESP, Associates, Hazard Mitigation Planner	X	X	X	
Hamby, Karen	NCEM, Multi-Hazard Planner	X		X	X
Hill, Courtney	American Red Cross, Senior Recruitment Specialist		X		
Langer, Steven	NCEM, Multi-Hazard Planner			X	
Leonhart, Rebecca	Atrium Health, Emergency Management Specialist		X	X	
Lewis, Richard	American Red Cross, Disaster Recovery Volunteer			X	X
McIndoe, Patrick	Messer Americas, Operations Technician			X	
Mello, John	NCEM, Hazard Mitigation Planner	X			
Rebbeor, Dylan	NC Forest Service, County Ranger			X	
Rhyne, Lisa	Piedmont Natural Gas, Stakeholder Engagement Manager			X	
Skinner, Steven	Corning Inc., Environmental Health Specialist		X		
Slaughter, Nathan	ESP Associates, Hazard Mitigation Dept. Manager	X	X	X	X
Smyly, Bradley	Corning Inc.				X
Streba, Catrina	Atrium Health, Emergency Management Specialist			X	

CSU MEETING PARTICIPANTS AND SIGN-IN SHEETS

NAME	DEPARTMENT / AGENCY / TITLE	Attended Internal Kickoff Meeting 2/8/24	Attended Stakeholder Kickoff Meeting 3/13/24	Attended HIRA Mitigation Meeting 7/11/24	Attended Public Meeting 2/11/25
Stroud, Carrie	Union Power Cooperative, Vice President of Communications & Marketing			X	
Thomas, Jake	Union Power Cooperative, Manager of Marketing & Energy Services			X	
Thompson, Ozell	Huntersville, Fire Service				X
Wegner, Marther	Duke Energy, District Manager			X	
Wiseman, Eric	NCEM, Area Coordinator	X		X	

1. Summary

Meeting title Cabarrus Stanly Union Regional HMP Internal Kickoff

Attended participants 14

Start time 2/08/24, 1:53:44 PM

End time 2/08/24, 2:43:48 PM

Meeting duration 50m 3s

Average attendance time 45m 4s

2. Participants

Name	First Join	Last Leave	In-Meeting Duration	Email	Participant ID (UPN)	Role
Nathan Slaughter	2/08/24, 1:54:07 PM	2/08/24, 2:43:48 PM	49m 41s	nslaughter@espassociates.com	nslaughter@espassociates.com	Organizer
Hamby, Karen (NCEM)	2/08/24, 1:54:02 PM	2/08/24, 2:43:41 PM	49m 39s	Karen.Hamby@ncdps.gov	Karen.Hamby@ncdps.gov	Presenter
Crew, John (NCEM)	2/08/24, 1:55:23 PM	2/08/24, 2:43:30 PM	48m 7s	john.crew@ncdps.gov	john.crew_ncdps.gov#EXT#@ESPASSOCIATES.onmicrosoft.com	Presenter
Tiffany Arant	2/08/24, 1:56:31 PM	2/08/24, 2:43:38 PM	47m 7s	Tiffany.Arant@unioncountync.gov	tarant@unioncountync.gov	Presenter
Andrew Ansley	2/08/24, 1:56:31 PM	2/08/24, 2:43:30 PM	46m 59s	Andrew.Ansley@unioncountync.gov	aansley@unioncountync.gov	Presenter
John Flores	2/08/24, 1:57:04 PM	2/08/24, 2:43:43 PM	44m 27s	jflores@espassociates.com	jflores@espassociates.com	Presenter
Wiseman, Eric (NCEM)	2/08/24, 1:57:24 PM	2/08/24, 2:43:43 PM	46m 18s	eric.wiseman@ncdps.gov	eric.wiseman@ncdps.gov	Presenter
Dawn Gustafson	2/08/24, 1:57:49 PM	2/08/24, 2:43:39 PM	45m 50s	ddgustafson@cabarruscounty.us	ddgustafson@cabarruscounty.us	Presenter
Michael Roark	2/08/24, 1:58:37 PM	2/08/24, 2:43:40 PM	45m 2s			Presenter
Hannah Delude	2/08/24, 1:58:43 PM	2/08/24, 2:43:43 PM	45m	hdelude@espassociates.com	hdelude@espassociates.com	Presenter
Scheirer, Sara	2/08/24, 1:58:52 PM	2/08/24, 2:43:42 PM	44m 50s	sara.scheirer@fema.dhs.gov	0474415197@FEMA.DHS.GOV	Presenter
Mello, John (NCEM)	2/08/24, 1:59:51 PM	2/08/24, 2:43:41 PM	43m 49s	John.Mello@ncdps.gov	John.Mello@ncdps.gov	Presenter

Baker, Carl (NCEM) 2/08/24, 2:02:02 PM 2/08/24, 2:43:44 PM 41m 41s
carl.baker@ncdps.gov carl.baker@ncdps.gov Presenter

Jason Burnett 2/08/24, 2:11:14 PM 2/08/24, 2:43:45 PM 32m 31s
JABurnett@cabarruscounty.usjaburnett@cabarruscounty.us Presenter

3. In-Meeting Activities

Name Join Time Leave Time Duration Email Role

Nathan Slaughter 2/08/24, 1:54:07 PM 2/08/24, 2:43:48 PM 49m 41s
nslaughter@espassociates.com Organizer

Hamby, Karen (NCEM) 2/08/24, 1:54:02 PM 2/08/24, 2:43:41 PM 49m 39s
Karen.Hamby@ncdps.gov Presenter

Crew, John (NCEM) 2/08/24, 1:55:23 PM 2/08/24, 2:43:30 PM 48m 7s john.crew@ncdps.gov
Presenter

Tiffany Arant 2/08/24, 1:56:31 PM 2/08/24, 2:43:38 PM 47m 7s
Tiffany.Arant@unioncountync.gov Presenter

Andrew Ansley 2/08/24, 1:56:31 PM 2/08/24, 2:43:30 PM 46m 59s
Andrew.Ansley@unioncountync.gov Presenter

John Flores 2/08/24, 1:57:04 PM 2/08/24, 1:58:34 PM 1m 29s jflores@espassociates.com
Presenter

John Flores 2/08/24, 2:00:45 PM 2/08/24, 2:43:43 PM 42m 58s
jflores@espassociates.com Presenter

Wiseman, Eric (NCEM) 2/08/24, 1:57:24 PM 2/08/24, 2:43:43 PM 46m 18s
eric.wiseman@ncdps.gov Presenter

Dawn Gustafson 2/08/24, 1:57:49 PM 2/08/24, 2:43:39 PM 45m 50s
ddgustafson@cabarruscounty.us Presenter

Michael Roark 2/08/24, 1:58:37 PM 2/08/24, 2:43:40 PM 45m 2s Presenter

Hannah Delude 2/08/24, 1:58:43 PM 2/08/24, 2:43:43 PM 45m
hdelude@espassociates.com Presenter

Scheirer, Sara 2/08/24, 1:58:52 PM 2/08/24, 2:43:42 PM 44m 50s
sara.scheirer@fema.dhs.gov Presenter

Mello, John (NCEM) 2/08/24, 1:59:51 PM 2/08/24, 2:43:41 PM 43m 49s
John.Mello@ncdps.gov Presenter

Baker, Carl (NCEM) 2/08/24, 2:02:02 PM 2/08/24, 2:43:44 PM 41m 41s
carl.baker@ncdps.gov Presenter

Jason Burnett JABurnett@cabarruscounty.us	2/08/24, 2:11:14 PM	2/08/24, 2:43:45 PM	32m 31s Presenter

CSU MEETING PARTICIPANTS AND SIGN-IN SHEETS

Scanned Sign-In Sheets
Larger Stakeholder Kickoff Meeting

Cabarrus Stanly Union Hazard Mitigation Plan Update
Stakeholder Meeting

March 13, 2024
2:00 PM - 4:00 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
STEVEN J KINNER	CORNING INC, EHS	704-569-7114	SKINNERSC@CORNING.COM
Scott Boyack	UCEM	980 315-9109	Scott.Boyack@unioncountync.gov
Will Seamon	UCEM	704-441-2555	William.seamon@unioncountync.gov
Will Cannon	Red Cross	980 415 5554	will.cannon@redcross.org
Mark Sellin	Cabco LEPC/ Civil Air Patrol	201 213 1882	emergmgtms@gmail.com
Craig Thomas	Town of Midland	704-888-2232	cthomas@midlandnc.us
JOSHUA CASE	MIDLAND FIRE DEPT	(704) 550-6547	jcase@midlandfirerescue.org
Dawn GUSTAFSON	CABARRUS CO. EM	(704) 920-2419	ddgustafson@cabarruscounty.us
JASON BURNETT	CABARRUS COUNTY EM	704-920-2417	JBURNETT@CABARRUSCOUNTY.US
James Howden SAM	Cabarrus County	704-920-6218	jmhowden@cabarruscounty.us

Cabarrus Stanly Union Hazard Mitigation Plan Update
Stakeholder Meeting

March 13, 2024

2:00 PM - 4:00 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
STEVEN SKINNER	CORNING INC, EHS	704-569-7114	SKINNERSC@CORNING.COM
Scott Boyack	UCEM	980 315-9109	Scott.Boyack@unioncountync.gov
Will Seamon	UCEM	704-441-2555	William.seamon@unioncountync.gov
Will Cannon	Red Cross	980 415 5554	will.cannon@redcross.org
Mark Sellin	Cabco LEAC/ Civil Air Patrol	201 213 1882	emergmgtms@gmail.com
Craig Thomas	Town of Midland	704-888-2232	cthomas@midlandnc.us
Joshua CASE	MIDLAND FIRE DEPT	(704) 550-6547	jcase@midlandfireandrescue.org
Dawn GUSTAFSON	CABARRUS CO. EM	(704) 920-2419	ddgustafson@cabarruscounty.us
JASON BURNETT	CABARRUS COUNTY EM	704-920-2417	JABURNETT@CABARRUSCOUNTY.US
James Howden SAM	Cabarrus County	704-920-6218	jmhowden@cabarruscounty.us

Cabarrus Stanly Union Hazard Mitigation Plan Update
Stakeholder Meeting

March 13, 2024
2:00 PM - 4:00 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Steven Langer	NCEM	919-624-0533	steve.langer@ncdps.gov
Michael Roark	STANLY EM	704-986-3650	mroark@stanlycountync.gov
Andrew Ansley	UNION CO. EM	704.290.4644	andrew.ansley@unioncountync.gov
Karen Hawley	NCEM	828-726-4000	Karen.Hawley@ncdps.gov
Hannah DeLude	ESP	315-520-2089	hdelude@espassociates.com
Robbie Boyd	Concord Fire	980-521-0892	BoydR@concordnc.gov
Bryan Kindley	Monroe Fire Dept.	704-290-7152	bkindley@monroenc.org
Chad Drye	Wingate Police Dept.	704-956-3058	cdrye@townofwingatenc.gov

Cabarrus Stanly Union Hazard Mitigation Plan Update
Stakeholder Meeting

March 13, 2024

2:00 PM - 4:00 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Rebecca Leonhardt	Atrium Health Emergency Mngt	704·699·6809	Rebecca.Leonhardt@atriumhealth.org
RICK BECKER	TOWN OF MINERAL SPRINGS	704 989 - 1577	msnc mayor@yahoo.com
RODNEY HARRIS	Cabarrus County CMO	704-920-2107	RDHARRIS@cabarruscounty.us
Amy Potoczny	Cabarrus Health Alliance	704-920-1281	amy.potoczny@cabarrushealth.org
Davy Broom	Village of Marvin Public Works Director	980-328-1462	dbroom@marvinnc.gov
Christina Amos	Village of Marvin	704-843-1680	Manager@marvinnc.gov
Karen Dewey	Weddington	704-846-2709	kdewey@townofweddington.com
Jeff Wells	Waxhaw	704-219-8669	jwells@waxhaw.com
VICKY BROOKS (DID NOT ATTEND)	MINERAL SPRINGS CLERK/PLANNING DIRECTOR	704 289-5331	msvickybrooks@aol.com

Cabarrus Stanly Union Hazard Mitigation Plan Update
Stakeholder Meeting

March 13, 2024

2:00 PM - 4:00 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Lee Jenson	Union County Planning	704-283-3564	lee.jenson@unioncountync.gov
Sara Scheirer	Local Disaster Recovery Manager/Union County	864-337-1573	sara.scheirer@unioncountync.gov
Tiffany Arant	County Managers Office - UC.	843-672-8944	tiffany.arant@unioncountync.gov

Cabarrus Stanly Union Hazard Mitigation Plan Update
Stakeholder Meeting

March 13, 2024

2:00 PM - 4:00 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Janice del Rio	Environmental Engineer at Corning, Inc.	787-397-6859	delriorojje@corning.com

Cont

Am Roberts	Cabarrus Co. AuxComm	704) 305-8136	sroberts@pipeline.com
EVIN GRANT	CABARRUS COUNTY	704 920-3209	KPGRANT@CABARRUSCOUNTY.US
:o ff Boyack	UCEM	980 315 9109	ScottBoyack@unionCounty.gov
im Sells	Town of Mt Pleasant	980-248-3341	sellsj@mtpleasantnc.gov
AN CRANE	CITY OF CONCORD EM	704-920-5211	Cranei@concordnc.gov
BBIE [redacted] Boyd	Concord Fire Dept	980-521-0892	BoydA@ConcordNC.gov
:n Bradley	Cabarrus County Risk Mgmt.	704-920-2218	jdbradley@cabarruscounty.us
urtney Hill	Red Cross	704-651-0246	Courtney.hill3@redcross.org

1. Summary

Meeting title "Cabarrus Stanly Union Regional Hazard Mitigation Plan - Stakeholder Kickoff Meeting "

Attended participants 12

Start time 3/13/24, 1:12:48 PM

End time 3/13/24, 3:19:31 PM

Meeting duration 2h 6m 42s

Average attendance time 1h 57s

2. Participants

Name First Join Last Leave In-Meeting Duration Email Participant ID (UPN) Role

UCEM EOC 3/13/24, 1:12:59 PM 3/13/24, 3:19:31 PM 2h 6m 31s
UCEM.EOC@unioncountync.gov EMEOC@unioncountync.gov Presenter

Mike Efird - Town of Red Cross 3/13/24, 1:51:26 PM 3/13/24, 2:59:09 PM 1h 7m 42s
Presenter

Hannah DeLude (ESP) 3/13/24, 1:52:29 PM 3/13/24, 2:59:57 PM 1h 7m 28s
Presenter

Ray Allen 3/13/24, 1:52:29 PM 3/13/24, 2:55:22 PM 1h 2m 52s
Presenter

Baker, Carl (NCEM) 3/13/24, 1:55:06 PM 3/13/24, 2:54:06 PM 59m carl.baker@ncdps.gov
carl.baker@ncdps.gov Presenter

"Georgia " 3/13/24, 1:57:18 PM 3/13/24, 2:58:28 PM 1h 1m 9s
Presenter

Susie Morris 3/13/24, 2:00:38 PM 3/13/24, 2:54:25 PM 53m 46s
SAMorris@cabarruscounty.us samorris@cabarruscounty.us Presenter

Matt Love 3/13/24, 2:01:15 PM 3/13/24, 2:55:15 PM 53m 59s
TMLove@cabarruscounty.us tmlove@cabarruscounty.us Presenter

John Flores 3/13/24, 2:01:19 PM 3/13/24, 2:55:29 PM 54m 10s
jflores@espassociates.com jflores@espassociates.com Presenter

Wiseman, Eric (NCEM) 3/13/24, 2:02:24 PM 3/13/24, 2:23:23 PM 19m 5s
eric.wiseman@ncdps.gov eric.wiseman@ncdps.gov Presenter

Crew, John (NCEM) 3/13/24, 2:02:37 PM 3/13/24, 2:54:20 PM 51m 42s
john.crew@ncdps.gov john.crew_ncdps.gov#EXT#@ESPASSOCIATES.onmicrosoft.com
Presenter

Jay 3/13/24, 2:03:02 PM 3/13/24, 2:57:03 PM 54m Presenter

3. In-Meeting Activities

Name Join Time Leave Time Duration Email Role

UCEM EOC 3/13/24, 1:12:59 PM 3/13/24, 3:19:31 PM 2h 6m 31s
UCEM.EOC@unioncountync.gov Presenter

Mike Efird - Town of Red Cross 3/13/24, 1:51:26 PM 3/13/24, 2:59:09 PM 1h 7m 42s
Presenter

Hannah DeLude (ESP) 3/13/24, 1:52:29 PM 3/13/24, 2:59:57 PM 1h 7m 28s
Presenter

Ray Allen 3/13/24, 1:52:29 PM 3/13/24, 2:55:22 PM 1h 2m 52s Presenter

Baker, Carl (NCEM) 3/13/24, 1:55:06 PM 3/13/24, 2:54:06 PM 59m carl.baker@ncdps.gov
Presenter

"Georgia " 3/13/24, 1:57:18 PM 3/13/24, 2:58:28 PM 1h 1m 9s Presenter

Susie Morris 3/13/24, 2:00:38 PM 3/13/24, 2:54:25 PM 53m 46s
SAMorris@cabarruscounty.us Presenter

Matt Love 3/13/24, 2:01:15 PM 3/13/24, 2:55:15 PM 53m 59s
TMLove@cabarruscounty.us Presenter

John Flores 3/13/24, 2:01:19 PM 3/13/24, 2:55:29 PM 54m 10s
jflores@espassociates.com Presenter

Wiseman, Eric (NCEM) 3/13/24, 2:02:24 PM 3/13/24, 2:04:00 PM 1m 35s
eric.wiseman@ncdps.gov Presenter

Wiseman, Eric (NCEM) 3/13/24, 2:05:52 PM 3/13/24, 2:23:23 PM 17m 30s
eric.wiseman@ncdps.gov Presenter

Crew, John (NCEM) 3/13/24, 2:02:37 PM 3/13/24, 2:54:20 PM 51m 42s
john.crew@ncdps.gov Presenter

Jay 3/13/24, 2:03:02 PM 3/13/24, 2:57:03 PM 54m Presenter

Cabarrus Stanly Union Hazard Mitigation Plan Update
Mitigation Strategy Meeting

July 11, 2024
11:30 AM - 1:30 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Sara Scheirer	Union County, Disaster Recovery Manager	864-337-1573	sara.scheirer@unioncountync.gov
Tiffany Arant	union co. Grants coor.	843-672-8944	Tiffany.Arant @unioncountync.gov
Karen Dewey	Town of Weddington	704-846-2709	kdewey@townofweddington.com
Joe Crapster	Duke Energy	704-582-9392	joseph.crapster@duke-energy.com
LISA Rhyne	Piedmont Natural Gas	7049657957	Lisa.Rhyne@duke-energy.com
Tamara Lunsford-Key	Cabarrus Health Alliance	704-920-1174	tamara.lunsfordkey@cabarrushealth.org
Kevin Ashley	City of Concord Deputy Planning Director	704-920-5149	ashleyk@concordnc.gov
Bryan McFadden	Union County IT/GIS	704-292-2619	bryan.mcfadden@unioncountync.gov
CHRIS LIENSCH	UnionCountyIT	704-292-2520	Christopher.liensch@unioncountync.gov

Cabarrus Stanly Union Hazard Mitigation Plan Update
Mitigation Strategy Meeting

July 11, 2024

11:30 AM - 1:30 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Sara Scheirer	Union County, Disaster Recovery Manager	864-337-1573	sara.scheirer@unioncountync.gov
Tiffany Arant	union co. Grants Coor.	843-672-8944	Tiffany.Arant@unioncountync.gov
Karen Dewey	Town of Weddington	704-846-2709	kdewey@townofweddington.com
Joe Crapster	Duke Energy	704-582-9392	joseph.crapster@duke-energy.com
Lisa Rhyne	Piedmont Natural Gas	7049657957	Lisa.Rhyne@duke-energy.com
Tamara Lunsford-Key	Cabarrus Health Alliance	704-920-1174	tamara.lunsfordkey@cabarrushealth.org
Kevin Ashley	City of Concord Deputy Planning Director	704-920-5149	ashleyk@concordnc.gov
Bryan McFadden	Union County IT/GIS	704-292-2619	bryan.mcfadden@unioncountync.gov
CHRIS LIERSCH	UnionCountyIT	704-292-2520	Christopher.liersch@unioncountync.gov

Cabarrus Stanly Union Hazard Mitigation Plan Update
Mitigation Strategy Meeting

July 11, 2024

11:30 AM - 1:30 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Rebecca Leonhardt	Atrium Health Emergency Management	704-699-6809	Rebecca.Leonhardt@atriumhealth.org
IAN CRANE	EM- CONCORD FIRE	704-920-5211	cranei@concordnc.gov
Michael Roark	STANLY CO. EM	704-791-8946	mroark@stanlycountync.gov
Steve Hanger	DCEM	~~704~~	steve.hanger@dcdps.gov.
Amy Potoczny	CHA	989-798-6544	amy.potoczny@cabarrushealth.org
Sam Roberts	Aux Comm	704) 305-8136	sroberts@pipeline.com
Aubrey Daly	CHA	719-307-6112	aubrey.daly@cabarrushealth.org
Brayan Childers	CHA	980-613-2457	brayan.Childers@cabarrushealth.org
Kelly Stafford	Cabo Co	980 521 7848	KPStafford@cabarruscounty.us

Richard Lewis Red Cross 704-796-5474 dick.lewis@redcross.org

Joselyn Council City of Kannapolis 704 224 3462 joselyncouncil@gmail.com

Cabarrus Stanly Union Hazard Mitigation Plan Update
Mitigation Strategy Meeting

July 11, 2024

11:30 AM - 1:30 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Jason Burnett	Cabarrus County EM	704-920-2417	JABurnett@cabarruscounty.us
Jon Bradley	Cabarrus County Risk Mgt	704-920-2218	jdbradley@cabarruscounty.us
Scott Boyack	UCEM	980 315 3109	Scott.Boyack@unioncountync.gov
Andrew Ansley	Union Co. EM	704.283.3575	andrew.ansley@unioncountync.gov
Jennifer Hatley	Cabarrus Health Alliance EH Director	980-581-0369	jennifer.hatley@cabarrushealth.org
Marcus Misenheimer	Cabarrus Health Alliance Back up Preparedness Coordinator Employee Health/Safety Manager	704-796-1339	Marcus.Misenheimer@Cabarrushealth.org
Mark Sellin	Civil Air Patrol Cabarrus County LEPC	201 213 1882	emergmgtms@gmail.com
Robbie Foxx	Cabarrus Co. Construction Standards	704-920-2138	rdfoxx@cabarruscounty.us
Matt Love	Cabarrus County Construction Standards	704 920-2131	tmlove@cabarruscounty.us

Dylan Rebbeor	NC Forest Service	704-609-0329	dylan.rebbeor@ncagr.gov
Elizabeth McCarty	Kannapolis Planning		emccarty@kannapolisnc.gov
Eric Wiseman	NCEM	8286745798	eric.wiseman@ncdps.gov

Cabarrus Stanly Union Hazard Mitigation Plan Update
Mitigation Strategy Meeting

July 11, 2024

11:30 AM - 1:30 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
Phillip Graham	Concord/Transportation Director	704 920 5338	grahamp@concordnc.gov
Kevin Pfannenstein	Concord/ Water Resources	920 5349	Pfannenstein@concordnc.gov
Davy Broom	Village of Marvin	980-328-1462	dbroom@marvinnc.gov
JACKIE DEAL	City of Concord Engineering	704-920-5401	Dealj@concordnc.gov
Craig Thomas	Town of Midland	704-888-2232	cthomas@midlandnc.us
Amy Mumpower	Village of Wesley Chapel	704-839-0182 x 2	deputy-clerk@wesleychapelnc.com
Teresa Campo	City of MONROE	704 282 4526	tcampo@monroenc.org
Robbie Boyd	Concord Fire	980-521-0892	Boydr@concordnc.gov

Cabarrus Stanly Union Hazard Mitigation Plan Update
Mitigation Strategy Meeting

July 11, 2024

11:30 AM - 1:30 PM

Name	Agency/Department/Position	Phone Number	E-mail Address
DAWN GUSTAFSON	CABARRUS CO. EM	704-920-2419	ddgustafson@cabarruscounty.us
KAREN HANBY	NCEM	828-726-4000	Karen.Hanby@ncdps.gov
Chadly Drye	Wingate Police	704-956-3058	Cdrye@townofwingate.nc.gov
Keith Ewry	Concord Police	704-920-5015	EWRYK@Concordnc.gov
Jim Sells	Town of Mt. Pleasant EM Planner	980-248-3341	sellsj@townofmountpleasant.us or concordfire5@gmail.com
Janice DelRio	Corning Inc.	787-397-6859	delriorojj@corning.com

1. Summary

Meeting title "Cabarrus Stanly Union Regional HMP: Risk Assessment and Mitigation Strategy Meeting "

Attended participants 16

Start time 7/11/24, 11:14:53 AM

End time 7/11/24, 1:31:46 PM

Meeting duration 2h 16m 53s

Average attendance time 1h 33m 34s

2. Participants

Name	First Join	Last Leave	In-Meeting Duration	Email	Participant ID (UPN)	Role
Nathan Slaughter	7/11/24, 11:14:54 AM	7/11/24, 1:30:50 PM	2h 15m 55s	nslaughter@espassociates.com	nslaughter@espassociates.com	Organizer
John Flores	7/11/24, 11:17:32 AM	7/11/24, 1:31:46 PM	2h 14m 13s	jflores@espassociates.com	jflores@espassociates.com	Presenter
Travis Barnhardt	7/11/24, 11:24:27 AM	7/11/24, 1:30:46 PM	2h 6m 19s	tbarnhardt@kannapolisnc.gov	tbarnhardt@KannapolisNC.gov	Presenter
Cole Whitehurst (External)	7/11/24, 11:25:34 AM	7/11/24, 1:30:44 PM	2h 5m 10s	ctwhitehurst@cabarruscounty.us	ctwhitehurst@cabarruscounty.us	Presenter
Kevin Starnes (Unverified)	7/11/24, 11:25:35 AM	7/11/24, 1:30:46 PM	2h 5m 11s			Presenter
Timothy Cook	7/11/24, 11:25:58 AM	7/11/24, 1:30:40 PM	2h 4m 41s	TCook@kannapolisnc.gov	TCook@KannapolisNC.gov	Presenter
Wegner, Martha W	7/11/24, 11:27:10 AM	7/11/24, 12:58:31 PM	1h 31m 20s	Martha.Wegner@duke-energy.com	Martha.Wegner@duke-energy.com	Presenter
Jason Gurian (External)	7/11/24, 11:29:05 AM	7/11/24, 1:30:47 PM	2h 1m 41s	Jason.Gurian@unioncountync.gov	JGURIAN@unioncountync.gov	Presenter
Donna D'Alessandro (External)	7/11/24, 11:29:31 AM	7/11/24, 1:31:11 PM	2h 1m 39s	Donna.D'Alessandro@unioncountync.gov	donnad@unioncountync.gov	Presenter
Patrick McIndoe (External)	7/11/24, 11:29:59 AM	7/11/24, 1:31:02 PM	2h 1m 2s	Patrick.McIndoe@messer-us.com	us173a@nagases.com	Presenter

Udoka S Obiechefu 7/11/24, 11:30:16 AM 7/11/24, 12:23:49 PM 53m 32s
Udoka.Obiechefu@cabarrushealth.org Udoka.Obiechefu@cabarrushealth.org
Presenter

Streba, Catrina P 7/11/24, 11:33:09 AM 7/11/24, 12:58:31 PM 1h 25m 22s
Catrina.Streba@atriumhealth.org Catrina.Streba@atriumhealth.org Presenter

Kevin Grant (External) 7/11/24, 11:33:10 AM 7/11/24, 11:35:27 AM 2m 16s
KPGrant@cabarruscounty.us kpgrant@cabarruscounty.us Presenter

Rhodes, Darren (External) 7/11/24, 11:34:46 AM 7/11/24, 11:39:25 AM 4m 39s
drhodes@ci.albemarle.nc.us drhodes@ci.albemarle.nc.us Presenter

Thomas, Jake 7/11/24, 12:07:12 PM 7/11/24, 1:08:27 PM 1h 1m 14s Jake.Thomas@union-power.com jake.thomas@union-power.com Presenter

Stroud, Carrie 7/11/24, 12:07:55 PM 7/11/24, 1:10:43 PM 1h 2m 47s carrie.stroud@union-power.com carrie.stroud@union-power.com Presenter

3. In-Meeting Activities

Name Join Time Leave Time Duration Email Role

Nathan Slaughter 7/11/24, 11:14:54 AM 7/11/24, 1:30:50 PM 2h 15m 55s
nslaughter@espassociates.com Organizer

John Flores 7/11/24, 11:17:32 AM 7/11/24, 1:31:46 PM 2h 14m 13s
jflores@espassociates.com Presenter

Travis Barnhardt 7/11/24, 11:24:27 AM 7/11/24, 1:30:46 PM 2h 6m 19s
tbarnhardt@kannapolisnc.gov Presenter

Cole Whitehurst (External) 7/11/24, 11:25:34 AM 7/11/24, 1:30:44 PM 2h 5m 10s
ctwhitehurst@cabarruscounty.us Presenter

Kevin Starnes (Unverified) 7/11/24, 11:25:35 AM 7/11/24, 1:30:46 PM 2h 5m 11s
Presenter

Timothy Cook 7/11/24, 11:25:58 AM 7/11/24, 1:30:40 PM 2h 4m 41s
TCook@kannapolisnc.gov Presenter

Wegner, Martha W 7/11/24, 11:27:10 AM 7/11/24, 12:58:31 PM 1h 31m 20s
Martha.Wegner@duke-energy.com Presenter

Jason Gurian (External) 7/11/24, 11:29:05 AM 7/11/24, 1:30:47 PM 2h 1m 41s
Jason.Gurian@unioncountync.gov Presenter

Donna D'Alessandro (External) 7/11/24, 11:29:31 AM 7/11/24, 1:31:11 PM 2h 1m 39s
Donna.D'Alessandro@unioncountync.gov Presenter

Patrick McIndoe (External) 7/11/24, 11:29:59 AM 7/11/24, 1:31:02 PM 2h 1m 2s
Patrick.McIndoe@messer-us.com Presenter

Udoka S Obiechefu 7/11/24, 11:30:16 AM 7/11/24, 12:23:49 PM 53m 32s
Udoka.Obiechefu@cabarrushealth.org Presenter

Streba, Catrina P 7/11/24, 11:33:09 AM 7/11/24, 12:58:31 PM 1h 25m 22s
Catrina.Streba@atriumhealth.org Presenter

Kevin Grant (External) 7/11/24, 11:33:10 AM 7/11/24, 11:35:27 AM 2m 16s
KPGrant@cabarruscounty.us Presenter

Rhodes, Darren (External) 7/11/24, 11:34:46 AM 7/11/24, 11:39:25 AM 4m 39s
drhodes@ci.albemarle.nc.us Presenter

Thomas, Jake 7/11/24, 12:07:12 PM 7/11/24, 1:08:27 PM 1h 1m 14s Jake.Thomas@union-power.com Presenter

Stroud, Carrie 7/11/24, 12:07:55 PM 7/11/24, 1:10:43 PM 1h 2m 47s carrie.stroud@union-power.com Presenter

1. Summary

Meeting title "Virtual Public Meeting for the Cabarrus Stanly Union Regional Hazard Mitigation Plan "

Registration page views 249

Registered participants 35

Canceled registrations 0

Attended participants 24

Start time 2/11/25, 5:44:06 PM

End time 2/11/25, 6:41:49 PM

Meeting duration 57m 43s

Average attendance time 30m 35s

2. Participants

Name First Join Last Leave In-Meeting Duration Email Participant ID (UPN) Role Registration First Name Registration Last Name Registration Email Registration Time Registration Status

Nathan Slaughter 2/11/25, 5:52:15 PM 2/11/25, 6:34:14 PM 41m 59s nslaughter@espassociates.com nslaughter@espassociates.com Organizer

Jim Sells (External) 2/11/25, 5:44:08 PM 2/11/25, 6:41:49 PM 57m 41s sellsj@mtpleasantnc.us sellsj@mtpleasantnc.us Attendee Jim Sells sellsj@mtpleasantnc.us 2/11/25, 8:27:16 AM Registered

Ian Crane (Unverified) 2/11/25, 5:46:50 PM 2/11/25, 6:33:41 PM 46m 50s Attendee Ian Crane cranei@concordnc.gov 2/11/25, 6:54:39 AM Registered

Corriher, Ashtyn 2/11/25, 5:48:23 PM 2/11/25, 6:32:01 PM 35m 59s CorriherA@corning.com CorriherA@corning.com Attendee Ashtyn Corriher corrihera@corning.com 2/11/25, 7:34:20 AM Registered

Andrew Ansley 2/11/25, 5:48:50 PM 2/11/25, 6:07:54 PM 19m 4s Attendee Andrew Ansley andrew.ansley@unioncountync.gov 1/29/25, 10:54:33 AM Registered

Sam Roberts (Unverified) 2/11/25, 5:51:09 PM 2/11/25, 6:32:12 PM 41m 3s Attendee Sam Roberts sroberts@pipeline.com 2/05/25, 2:37:04 PM Registered

Tim Mills 2/11/25, 5:52:33 PM 2/11/25, 6:33:59 PM 41m 26s
Attendee Tim Mills tmills@midlandfireandrescue.org 2/11/25, 11:52:33 AM Registered

Michael Roark (Unverified) 2/11/25, 5:53:23 PM 2/11/25, 6:33:48 PM 40m 24s
Attendee Michael Roark mroark@stanlycountync.gov 2/11/25, 1:19:35 PM Registered

Hamby, Karen (NCEM) (External) 2/11/25, 5:55:32 PM 2/11/25, 6:32:02 PM 36m 29s
Karen.Hamby@ncdps.gov Karen.Hamby@ncdps.gov Attendee Karen Hamby karen.hamby@ncdps.gov 1/29/25, 10:42:59 AM Registered

Hannah Delude 2/11/25, 5:56:23 PM 2/11/25, 6:32:46 PM 36m 22s
hdelude@espassociates.com hdelude@espassociates.com Attendee Hannah DeLude hdelude@espassociates.com 1/29/25, 10:39:46 AM Registered

Barb B. (Unverified) 2/11/25, 5:56:25 PM 2/11/25, 6:04:59 PM 8m 34s
Attendee Barbara Bolden barbara.bolden@gmail.com 2/08/25, 8:52:34 AM Registered

Peter B (Unverified) 2/11/25, 5:57:51 PM 2/11/25, 6:23:19 PM 25m 28s
Attendee Barbara Bolden barbara.bolden@gmail.com 2/08/25, 8:52:34 AM Registered

LoanBoss Notetaker (Unverified) 2/11/25, 5:58:34 PM 2/11/25, 6:35:15 PM 36m 40s
Attendee

Ozell (Unverified) 2/11/25, 6:00:33 PM 2/11/25, 6:14:14 PM 13m 41s
Attendee Ozell Thompson ozellt65@gmail.com 2/10/25, 1:17:55 PM Registered

Smyly, Bradley S 2/11/25, 6:00:53 PM 2/11/25, 6:32:02 PM 31m 9s
SmylyBS@corning.com SmylyBS@corning.com Attendee Brad Smyly smylybs@corning.com 2/11/25, 7:21:33 AM Registered

Lewis, Dick 2/11/25, 6:02:02 PM 2/11/25, 6:33:15 PM 31m 13s
dick.lewis@redcross.org dick.lewis@redcross.org Attendee Richard Lewis dick.lewis@redcross.org 1/29/25, 4:01:24 PM Registered

Ashleigh Ennis (External) 2/11/25, 6:03:45 PM 2/11/25, 6:32:09 PM 28m 23s
agennis@cabarruscounty.us agennis@cabarruscounty.us Attendee Ashleigh Ennis ashleighennis@gmail.com 2/11/25, 6:02:59 PM Registered

Dylan E (Unverified) 2/11/25, 6:03:48 PM 2/11/25, 6:32:51 PM 29m 2s
Attendee Dylan Ennis dylanennis19@gmail.com 2/10/25, 2:28:57 PM Registered

Amy M Potoczny 2/11/25, 6:05:22 PM 2/11/25, 6:31:56 PM 26m 34s
Amy.Potoczny@CabarrusHealth.org Amy.Potoczny@CabarrusHealth.org Attendee

Amy Potoczny amy.potoczny@cabarrushealth.org 2/11/25, 6:04:23 PM Registered

Andrew Ansley (External) 2/11/25, 6:07:52 PM 2/11/25, 6:33:27 PM 25m 34s
Andrew.Ansley@unioncountync.gov aansley@unioncountync.gov Attendee
Andrew Ansley andrew.ansley@unioncountync.gov 1/29/25, 10:54:33 AM Registered

Jason Burnett (External) 2/11/25, 6:08:07 PM 2/11/25, 6:34:06 PM 25m 58s
JABurnett@cabarruscounty.usjaburnett@cabarruscounty.us Attendee Jason Burnett jaburnett@cabarruscounty.us 2/11/25, 5:51:36 PM Registered

Dawn Gustafson (External) 2/11/25, 6:08:52 PM 2/11/25, 6:32:05 PM 23m 12s
ddgustafson@cabarruscounty.us ddgustafson@cabarruscounty.us Attendee
Dawn Gustafson ddgustafson@cabarruscounty.us 2/11/25, 5:56:15 PM Registered

Cole Whitehurst (External) 2/11/25, 6:09:55 PM 2/11/25, 6:32:04 PM 22m 8s
ctwhitehurst@cabarruscounty.us ctwhitehurst@cabarruscounty.us Attendee
Jason Burnettjaburnett@cabarruscounty.us 2/11/25, 5:51:36 PM Registered

Peter B (Unverified) 2/11/25, 6:22:56 PM 2/11/25, 6:32:08 PM 9m 11s
Attendee Barbara Bolden barbara.bolden@gmail.com 2/08/25, 8:52:34 AM Registered

Kevin Starnes
kstarnes@waxhaw.com 1/30/25, 11:09:08 AM Registered

Georgia Harvey
gharvey@oakboro.com 1/31/25, 10:25:29 AM Registered

Richard Jenson
lee.jensoon@unioncountync.gov 2/05/25, 10:46:13 AM Registered

Pat Hamilton
phamilt22@gmail.com 2/07/25, 6:14:07 PM Registered

Debbie Lee deb@eyeofworld.com
2/07/25, 7:03:33 PM Registered

Hunter Angie angelahunter849@yahoo.com
2/09/25, 7:10:18 AM Registered

Wesley Dangerfield
wesley.dangerfield@gmail.com 2/10/25, 6:46:52 AM Registered

Debbie Guerrero dlugo24@gmail.com
2/10/25, 10:07:31 AM Registered

Madeline Thomas
madeline_thomas@yahoo.com 2/10/25, 10:45:03 AM Registered

		Herman	Lynch	hglynchjr@gmail.com	
2/10/25, 11:08:58 AM	Registered				
		Eric	LaPrad	erlaprad@gmail.com	
2/10/25, 11:32:37 AM	Registered				
		Carmine	Cuccaro		
carmine.cuccaro@atriumhealth.org	2/10/25, 2:05:40 PM	Registered			
		Jeff	Mitchell		
jeffery.mitchell@cabarrus.k12.nc.us	2/10/25, 2:20:02 PM	Registered			
		Amanda	Kessler		
amanda.kessler@loanboss.com	2/10/25, 5:22:00 PM	Registered			
		O'Dell	Long	odell.long@perdue.com	
2/11/25, 9:19:08 AM	Registered				
		Cole	Whitehurst		
ctwhitehurst@cabarruscounty.us	2/11/25, 5:50:52 PM	Registered			
		Ashleigh	Ennis		
agennis@cabarruscounty.us	2/11/25, 6:01:02 PM	Registered			

3. In-Meeting Activities

Name	Join Time	Leave Time	Duration	Email	Role
Nathan Slaughter	2/11/25, 5:52:15 PM	2/11/25, 6:34:14 PM	41m 59s		
nslaughter@espassociates.com	Organizer				
Jim Sells (External)	2/11/25, 5:44:08 PM	2/11/25, 6:41:49 PM	57m 41s		
sellsj@mtpleasantnc.us	Attendee				
Ian Crane (Unverified)	2/11/25, 5:46:50 PM	2/11/25, 6:33:41 PM	46m 50s		
Attendee					
Corriher, Ashtyn	2/11/25, 5:48:23 PM	2/11/25, 5:49:23 PM	59s		
CorriherA@corning.com	Attendee				
Corriher, Ashtyn	2/11/25, 5:54:03 PM	2/11/25, 5:55:03 PM	59s		
CorriherA@corning.com	Attendee				
Corriher, Ashtyn	2/11/25, 5:58:00 PM	2/11/25, 6:32:01 PM	34m 1s		
CorriherA@corning.com	Attendee				
Andrew Ansley	2/11/25, 5:48:50 PM	2/11/25, 6:07:54 PM	19m 4s	Attendee	
Sam Roberts (Unverified)	2/11/25, 5:51:09 PM	2/11/25, 6:32:12 PM	41m 3s		
Attendee					

Tim Mills 2/11/25, 5:52:33 PM 2/11/25, 6:33:59 PM 41m 26s Attendee

Michael Roark (Unverified) 2/11/25, 5:53:23 PM 2/11/25, 6:33:48 PM 40m 24s Attendee

Hamby, Karen (NCEM) (External) 2/11/25, 5:55:32 PM 2/11/25, 6:32:02 PM 36m 29s Karen.Hamby@ncdps.gov Attendee

Hannah Delude 2/11/25, 5:56:23 PM 2/11/25, 6:32:46 PM 36m 22s hdelude@espassociates.com Attendee

Barb B. (Unverified) 2/11/25, 5:56:25 PM 2/11/25, 6:04:59 PM 8m 34s Attendee

Peter B (Unverified) 2/11/25, 5:57:51 PM 2/11/25, 6:23:19 PM 25m 28s Attendee

LoanBoss Notetaker (Unverified) 2/11/25, 5:58:34 PM 2/11/25, 6:35:15 PM 36m 40s Attendee

Ozell (Unverified) 2/11/25, 6:00:33 PM 2/11/25, 6:14:14 PM 13m 41s Attendee

Smyly, Bradley S 2/11/25, 6:00:53 PM 2/11/25, 6:32:02 PM 31m 9s SmylyBS@corning.com Attendee

Lewis, Dick 2/11/25, 6:02:02 PM 2/11/25, 6:33:15 PM 31m 13s dick.lewis@redcross.org Attendee

Ashleigh Ennis (External) 2/11/25, 6:03:45 PM 2/11/25, 6:32:09 PM 28m 23s agennis@cabarruscounty.us Attendee

Dylan E (Unverified) 2/11/25, 6:03:48 PM 2/11/25, 6:32:51 PM 29m 2s Attendee

Amy M Potoczny 2/11/25, 6:05:22 PM 2/11/25, 6:31:56 PM 26m 34s Amy.Potoczny@CabarrusHealth.org Attendee

Andrew Ansley (External) 2/11/25, 6:07:52 PM 2/11/25, 6:33:27 PM 25m 34s Andrew.Ansley@unioncountync.gov Attendee

Jason Burnett (External) 2/11/25, 6:08:07 PM 2/11/25, 6:34:06 PM 25m 58s JABurnett@cabarruscounty.usAttendee

Dawn Gustafson (External) 2/11/25, 6:08:52 PM 2/11/25, 6:32:05 PM 23m 12s ddgustafson@cabarruscounty.us Attendee

Cole Whitehurst (External) 2/11/25, 6:09:55 PM 2/11/25, 6:32:04 PM 22m 8s ctwhitehurst@cabarruscounty.us Attendee

Peter B (Unverified) 2/11/25, 6:22:56 PM 2/11/25, 6:32:08 PM 9m 11s Attendee

Internal Stakeholder Meeting Kickoff
February 8th, 2024
10:00am – 11:00am
Teams Meeting

I. Welcome and Introductions

a. KICKOFF PLANNING PROCESS
b. PROJECT TEAM INTRODUCTIONS
c. PLANNING TEAM INTRODUCTIONS

II. Project Overview

a. REQUIREMENTS FOR UPDATE
b. TRENDS IN DISASTERS – WHY PLAN?
c. FOUR-PHASE PLANNING PROCESS
d. SCOPE OF WORK

III. Project Schedule

a. INTERNAL KICK-OFF MEETING – 1/9/24
b. PROPOSED DELIVERY OF DRAFT – 11/28/24
c. EXISTING PLAN EXPIRATION DATE – 5/28/24

IV. Next Steps

a. SHARE PUBLIC SURVEY
b. IDENTIFY/CONFIRM ALL STAKEHOLDERS/CONTACTS
c. SCHEDULE LARGER STAKEHOLDER MEETING

Internal Stakeholder Meeting Kickoff
February 8th, 2024
10:00am – 11:00am
Teams Meeting

The internal kickoff meeting for the Cabarrus, Stanly, and Union Counties Regional Hazard Mitigation Plan Update marked the beginning of the planning process, following the last update in 2020. Key stakeholders from the three counties gathered to discuss the plan's objectives and outline the collaborative process ahead. Nathan Slaughter from ESP Associates facilitated the meeting, starting with a welcome and introductions.

The project overview highlighted the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), emphasizing that hazard mitigation planning is essential for maintaining eligibility for federal funding programs, such as Flood Mitigation Assistance (FMA), Building Resilient Infrastructure and Communities (BRIC), and the Hazard Mitigation Grant Program (HMGP). Additionally, the implications of NC Senate Bill 300 were noted, particularly regarding its relevance to state-declared disasters.

The planning process was reviewed, which involves organizing resources and forming a Hazard Mitigation Planning Committee comprised of county and municipal stakeholders. Public involvement will be integral, with plans for surveys and public meetings to gather input and feedback. The meeting also covered essential aspects of risk assessment, including hazard identification and vulnerability assessment, to understand the potential impacts of various hazards. Participants discussed the need for an "All-Hazards" approach aligned with the state Hazard Mitigation Plan (HMP).

The development of the mitigation plan will include revisiting existing planning goals and mitigation alternatives, with opportunities to add new actions based on the risk assessment findings. As the meeting progressed, there was consensus on the need to review existing mitigation goals and actions for the new action plan in alignment with the Community Rating System (CRS) and other requirements.

Adoption and implementation will involve collaboration with each county and municipality, with a focus on overcoming challenges faced in previous planning cycles. The meeting underscored the need for documentation of community participation, particularly from underserved populations, as well as considerations for climate change and equitable outcomes.

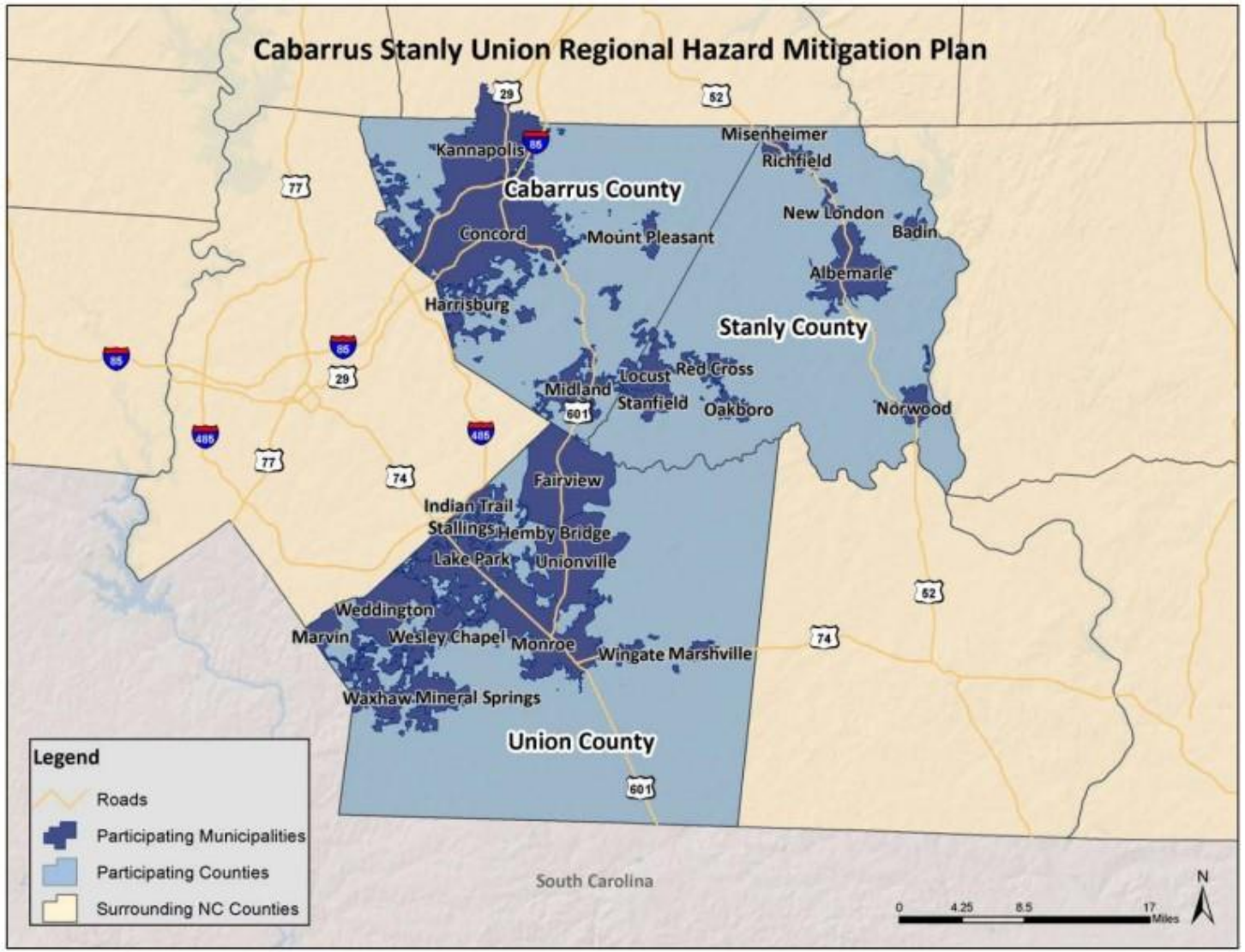
The project schedule includes planning for a larger kickoff meeting with more stakeholders and a series of follow-up meetings. Union County volunteered to host the first meeting official in mid-March. The draft plan is expected to be completed by December 2024, ahead of the expiration of the current plan in June 2025. Nathan will follow up with the counties on specific dates and scheduling coordination.

Cabarrus Stanly Union Region

Hazard Mitigation Plan Update

February 8, 2024

Internal Kickoff (Microsoft Teams)



Agenda

- Welcome & Introductions
- Mitigation Recap
- Project Overview
- Project Schedule
- Next Steps
- Questions
- Adjourn

Introductions

- Welcome!
- Project Team Introductions
- Participant Introductions

What is Mitigation?

“mit-i-gate”

1: to cause to become less harsh or hostile.

2: to make less severe or painful.

Hazard Mitigation

Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Basic Types of Mitigation

Mitigating against hazard impacts on **existing development**

- Houses
- Businesses
- Infrastructure
- Critical facilities

Ensuring **future development** is conducted in a way that does not increase vulnerability

- Plans
- Policies
- Procedures

Mitigation Techniques

1. Prevention
2. Property Protection
3. Natural Resource Management
4. Structural Projects
5. Emergency Services
6. Public Education and Awareness

Project Overview

- Requirements for Update
- Trends in Disasters – Why Plan?
- Disaster Mitigation Act (DMA) of 2000 Requirements
- Scope of Work

Requirements for Update

- DMA (2000) Plan Update Requirement
  - Created Framework to Engage in Hazard Mitigation Planning
- HMGP Grant Process
  - Provided by NCEM
  - 75% Federal 25% Local Cost Share
- Eligibility for Federal Disaster Funding
  - Update HMP Every 5 Years

Trends in Disasters – Why Plan?

- **Increase in Population and Community Growth**
  - Greater Exposure to Hazard Risk (People, Infrastructure, Buildings)
  - Increased Exposure = More Damage
- **More Hazards (Man-Made Hazards)**
  - For Example: Technological, Civil, and Terrorist Attacks
- **Results in Increased Cost for Disaster Response and Recovery**
  - Continual Increase in Hazard Expenses
  - Increase in Issuance of Major Disaster Declarations
  - Costliest Natural Disasters in Last 45 Years (NOAA Estimates)
- **Reasons to Address Trends**
  - Cost of Doing Nothing is too High
  - Many Events are Predictable and Repetitive
  - Loss Reduction Activities can be Undertaken
  - Legal and Moral Responsibilities to Act

Event/Date/Cost (in Billions)
Hurricane Harvey (2017) - $156.3
Hurricane Ian (2022) - $116.3
Hurricane Sandy (2012) - $86.5
Hurricane Ida (2021) - $82.4
Hurricane Irma (2017) - $62.5
Drought/Heatwave (1980) - $39.6
Hurricane Ivan (2004) - $33.2
Hurricane Michael (2018) - $30.5
Hurricane Florence (2018) - $29.3
Winter Storm/Cold Wave (2021) - $26.5

DMA (2000) Requirements

Four-Phase Planning Process

- Organize Resources
- Risk Assessment
- Develop a Mitigation Plan
- Adoption and Implementation

Process Blends with Processes of FMA and CRS

HMP Will Meet Requirements of all Three FEMA Programs

Step 1: Organize Resources

PLANNING FOR PUBLIC INVOLVEMENT

COORDINATING WITH DEPARTMENTS AND AGENCIES

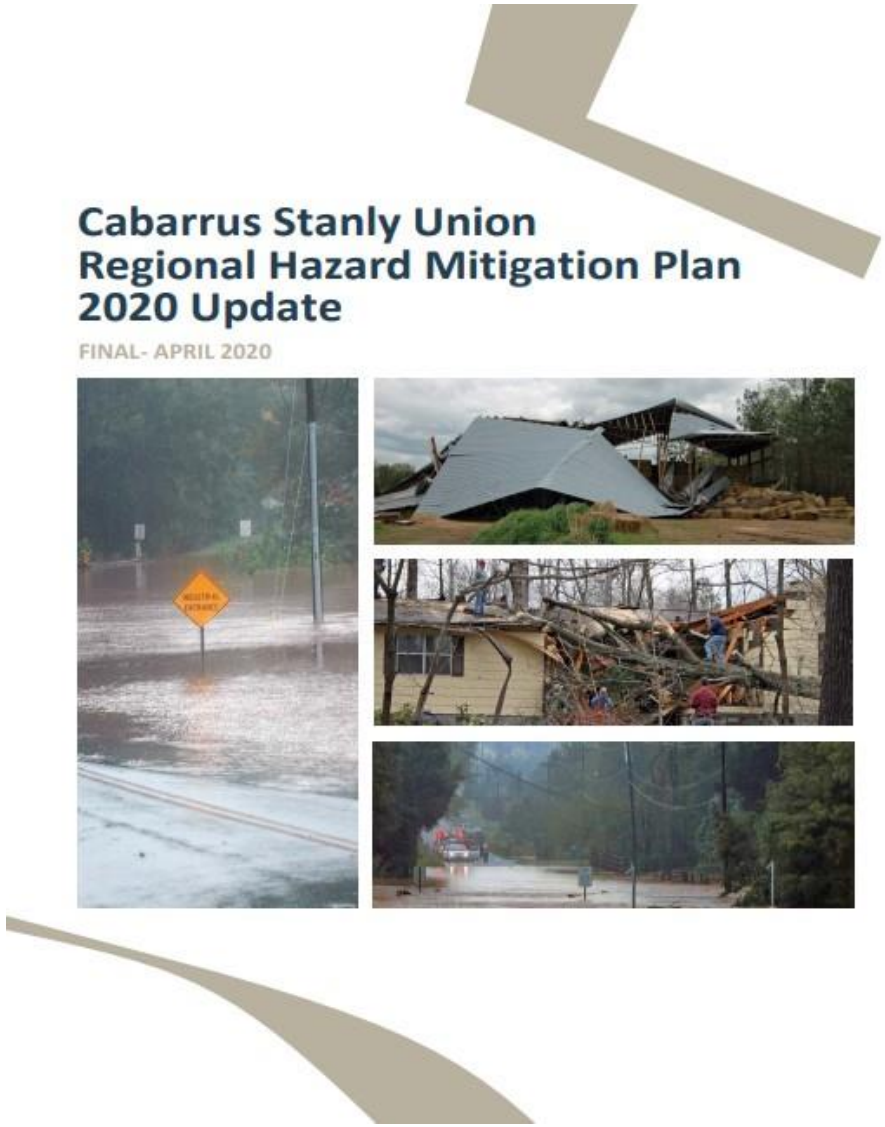
FINALIZING A LIST OF STAKEHOLDERS FOR INVOLVEMENT (HMPC)

Step 2: Risk Assessment

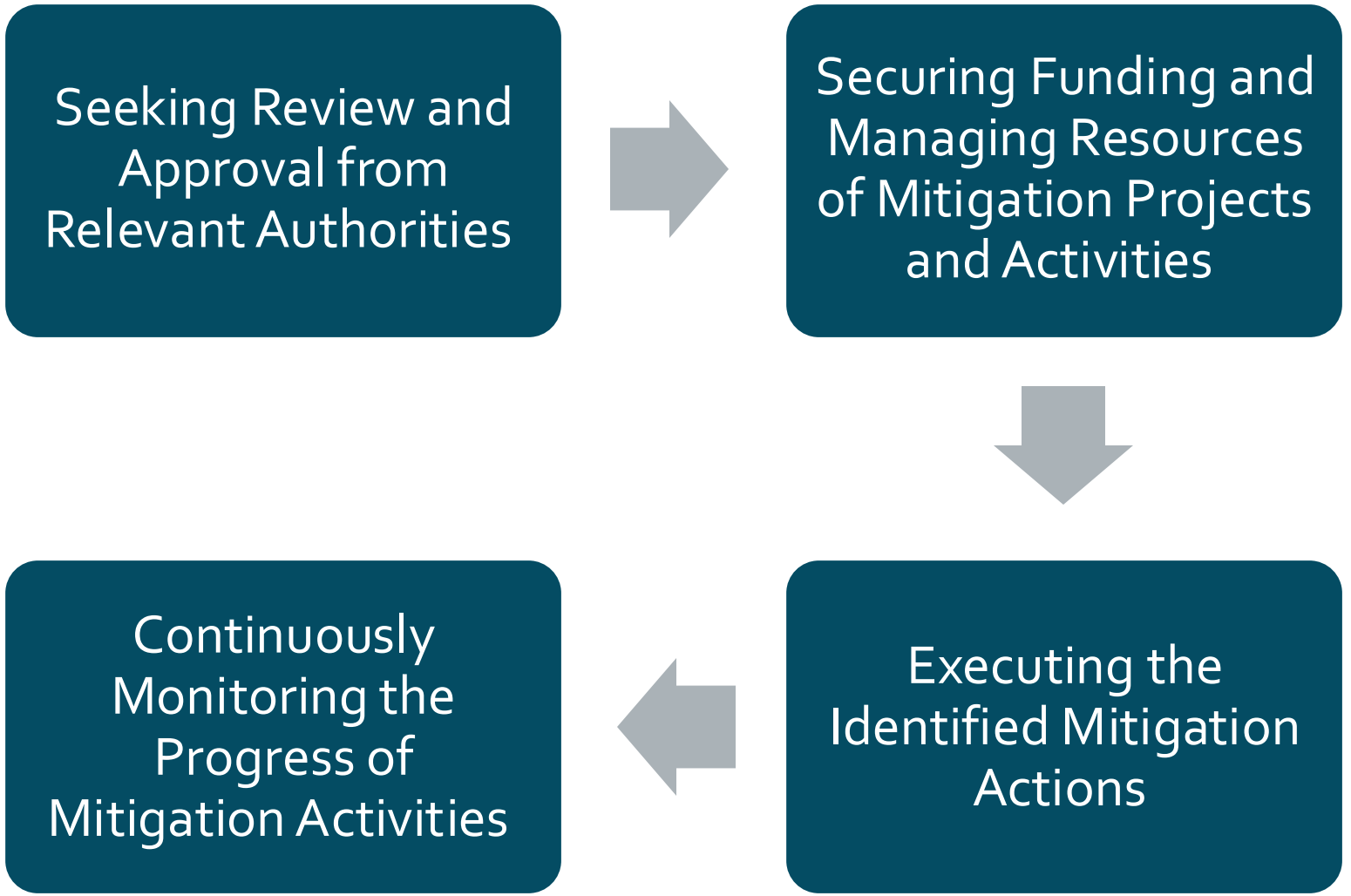
- Hazard Identification (What Can Happen Here)
  - **Previously Identified Hazards**: Drought, Excessive Heat, Hurricane and Coastal Hazards, Tornadoes/Thunderstorms, Severe Winter Weather, Dam Failures, Flooding, Earthquakes, Geological, Wildfires, Infectious Disease, Hazardous Substances, Radiological Emergency, Terrorism, Cyberattack, Electromagnetic Pulse
- Vulnerability Assessment (What Will be Affected/Impacted)
  - Will Use County Parcel Data, FEMA Hazus Analysis, and NCEM Data
- Capability Assessment (How Prepared We Are)
  - **Communities to Self-Assess Capability**
    - What Mitigation Actions are Feasible
    - Where Gaps Exist

Step 3: Develop a Mitigation Plan

- **Setting Planning Goals**
- **Reviewing Mitigation Alternatives**
  - HMPC May Need to Develop New Actions
- **Drafting an Action Plan**



Step 4: Adoption and Implementation



Scope of Work

The plan will meet the following criteria:

- Will include all required elements (as defined by FEMA)
- Will meet or exceed the final rule for local mitigation planning found in 44 CFR, Section 201.6, in order to be approved by FEMA
- Natural hazards will coordinate with current FEMA-approved State Mitigation Plan
- Will include natural and human-caused hazards and mitigation measures
- Will incorporate any local climate adaptation data and findings
- Will address equitable outcomes (underserved communities and social vulnerability)

Project Schedule

- Project Kickoff Date – 2/8/24
- Proposed Delivery of Draft – 12/16/24
- Existing Plan Expiration Date – 6/16/2025

Information Online

- We request that counties and municipalities post relevant project information and updates
- Can be used as a tool for HMPC Coordination and Public Outreach
- Ideas for Website Content (we can provide):
  - Upcoming Meeting Announcements
  - Meeting Agendas and Minutes
  - Public Survey
  - Draft Documents of Plan Update
  - Information on Identified Hazards
  - Opportunities to Provide Feedback

Next Steps

Identify/Confirm all Primary, Secondary, and Citizen Contacts

- Larger Group will be Invited to Second Mitigation Meeting (Date TBD)

Capability Assessment Update

- Project Team will review Capability Data to update Capability Assessment

Mitigation Action Status Updates

- Be Prepared to Discuss Mitigation Goals and Past Actions
- More Information Must be Provided for "Ongoing" Actions
- Details on Completed Actions May be Provided in the Status

Mitigation Goals Update

- All Actions Must Relate to a Mitigation Goal

Questions

Questions/Comments/Concerns

Contact Information

Nathan Slaughter –
nslaughter@espassociates.com

John Flores –
jflores@espassociates.com

Hannah DeLude –
hdelude@espassociates.com

Adjourn –
Thank you!

Larger Stakeholder Meeting Kickoff
March 13th, 2024
10:00am – 12:00pm
Monroe, NC

I. Welcome and Introductions

a. KICKOFF PROJECT
b. PROJECT TEAM INTRODUCTIONS
c. PLANNING TEAM INTRODUCTIONS
d. MEETING OBJECTIVES

II. Mitigation Overview

a. MITIGATION DEFINITIONS
b. TYPES OF MITIGATION
c. MITIGATION TECHNIQUES

III. Purpose of Update

a. REFLECT ON CHANGING RISKS
b. INCREASE COMMUNITY RESILIENCE
c. ENSURE COMPLIANCE AND FUNDING
d. INCREASE PREPAREDNESS

IV. Plan Update Process

a. ORGANIZE RESOURCES
b. PERFORM RISK ASSESSMENT
c. DEVELOP MITIGATION PLAN
d. ADOPTION AND IMPLEMENTATION

V. Project Schedule

a. INTERNAL KICKOFF MEETING – 2/8/24
b. LARGER KICKOFF MEETING – 3/13/24
c. PROPOSED DELIVERY OF DRAFT – 12/16/24
d. EXISTING PLAN EXPIRATION DATE – 6/16/25
e. PUBLIC MEETINGS – TBD

VI. Next Steps

a. SHARE PUBLIC SURVEY ON MUNICIPAL SITES
b. SELECT TIME/DATE FOR PUBLIC MEETING #1
c. ENGAGE SMALLER COMMUNITIES TO ENCOURAGE PARTICIPATION

Larger Stakeholder Meeting Kickoff
March 13th, 2024
10:00am – 12:00pm
Monroe, NC

In March 2024, the kickoff meeting for the Cabarrus, Stanly, and Union Counties Regional Hazard Mitigation Plan Update brought together the Hazard Mitigation Planning Committee (HMPC) to discuss key objectives and strategies for enhancing community resilience against hazards.

The meeting aimed to define hazard mitigation and explore its various types, focusing on existing developments' vulnerability and ensuring future developments minimize risks. Key mitigation techniques discussed included prevention strategies, property protection measures, natural resource management, structural projects, and emergency services enhancements. The meeting emphasized the importance of education and public awareness in fostering community resilience.

The update reflects changing risks due to increased development and a shift toward an “all hazards” approach, incorporating climate change considerations. The committee acknowledged the need to address new vulnerabilities, particularly among socially vulnerable populations, and to adopt effective strategies that maximize the value of implemented measures.

Compliance with the Disaster Mitigation Act of 2000 was highlighted, emphasizing the need for active planning to address areas with repetitive damage. The meeting discussed funding opportunities through various programs, including HMGP, FMA, BRIC, and CRS, and the expanded eligibility for BRIC projects.

The meeting outlined a four-step update process: organizing resources, conducting a risk assessment, developing a mitigation plan, and final adoption and implementation. Emphasis was placed on engaging smaller communities and stakeholders, utilizing data analysis for hazard identification, and preparing for public involvement.

Initial survey findings revealed that tornadoes and thunderstorms were perceived as the highest threats, while prevention was identified as the top mitigation technique.

During the open discussion, Chris Crew emphasized the importance of broad outreach to underserved communities, while Carl Baker highlighted the necessity of documenting underserved populations in the planning process. A Spanish version of the survey was requested at this time. The discussion included considerations of BRIC projects and the importance of addressing these in the planning stages.

The meeting concluded with a call for community involvement, emphasizing the importance of documenting engagement efforts and gathering feedback for the plan update. Participants were provided with contact information for follow-up and encouraged to schedule the next meeting promptly.

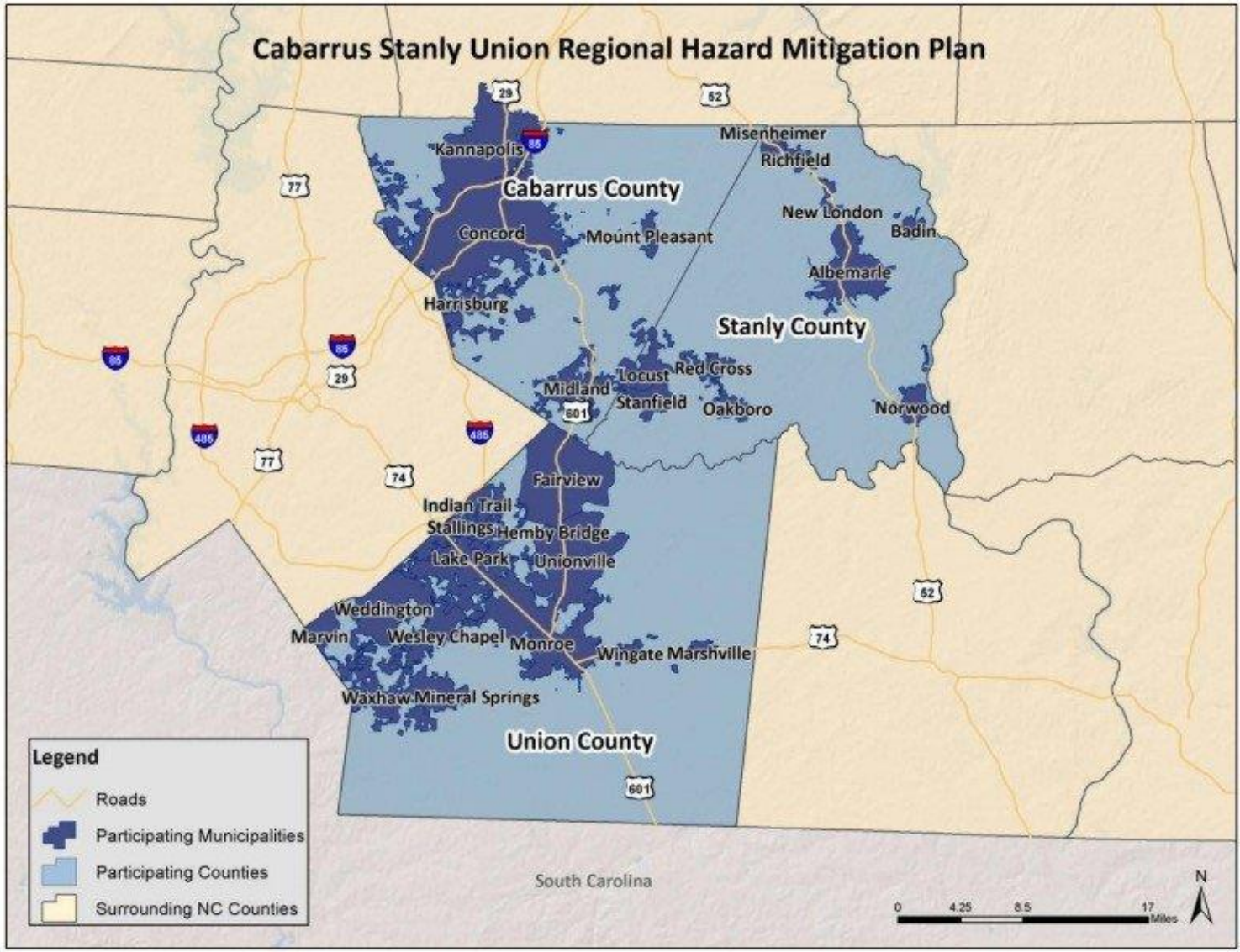
Cabarrus Stanly Union

2025 Hazard Mitigation Plan Update

Larger Stakeholder Meeting

March 13th, 2024

Union County EOC, Monroe NC



Agenda

- Welcome & Introductions
- Meeting Objectives
- Mitigation Overview
- Purpose of Update
- Plan Update Process
- Initial Survey Findings
- Project Information & Next Steps
- Q&A Session

Introductions

Welcome!

Reminder to Sign-In

Meeting Objectives

Engage the Community

Gather Input

Educate and Inform

Enhance Plan Relevance

What is Mitigation?

“mit-i-gate”

1: to cause to become less harsh or hostile.

2: to make less severe or painful.

Hazard Mitigation

Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Basic Types of Mitigation

Mitigating against hazard impacts on **existing development**

- Houses
- Businesses
- Infrastructure
- Critical Facilities

Ensuring **future development** is conducted in a way that does not increase vulnerability

- Plans
- Policies
- Procedures

Mitigation Techniques

1. Prevention
2. Property Protection
3. Natural Resource Management
4. Structural Projects
5. Emergency Services
6. Education and Awareness

Purpose of Update

- Reflect on Changing Risks
- Increase Community Resilience
- Compliance and Funding
- Ensure Preparedness

Purpose of Update – Changing Risks

1. Population Increase and Community Growth
   - Greater Exposure to Hazard Risk
   - Increased Exposure = More Damage
2. More Hazards (Man-Made)
   - Included in State Plan
   - Ex. Technological, Civil Disturbance, Terrorism
3. Climate Change
   - Anticipated Increase in Frequency and Magnitude
   - **New FEMA Requirement
4. Development Patterns
   - Increased Impermeable Surfaces
   - More Infrastructure and Assets at Risk

Purpose of Update – Increase Community Resilience

1. Identification of New Vulnerabilities
   - **Vulnerable Populations
2. Adopting Effective Mitigation Strategies

Purpose of Update – Compliance and Funding

Ensure compliance with federal and state requirements

- Disaster Mitigation Act of 2000
- NC GS 166 A

Maintain eligibility for disaster mitigation funding and assistance programs

- HMGP
- FMA
- BRIC
- CRS

Purpose of Update – Ensure Preparedness

The 2025 Plan Update ensures that Wake County is better prepared to:

1. Address existing and emerging hazards
2. Protect lives and property
3. Sustain continuity of essential services during and following an event

Plan Update Process

Step 1: Organize Resources

Planning	Planning for Public Involvement
Coordinating	Coordinating with Departments and Agencies
Finalizing	Finalizing a List of Stakeholders for Involvement (HMPC)

Hazard Identification

What Can Happen Here?

- Previously Identified Hazards
- Identify New Hazards

Vulnerability Assessment

What Will be Affected/Impacted?

- Will Use County Parcel Data, FEMA HAZUS Analysis, and NCEM Data

Capability Assessment

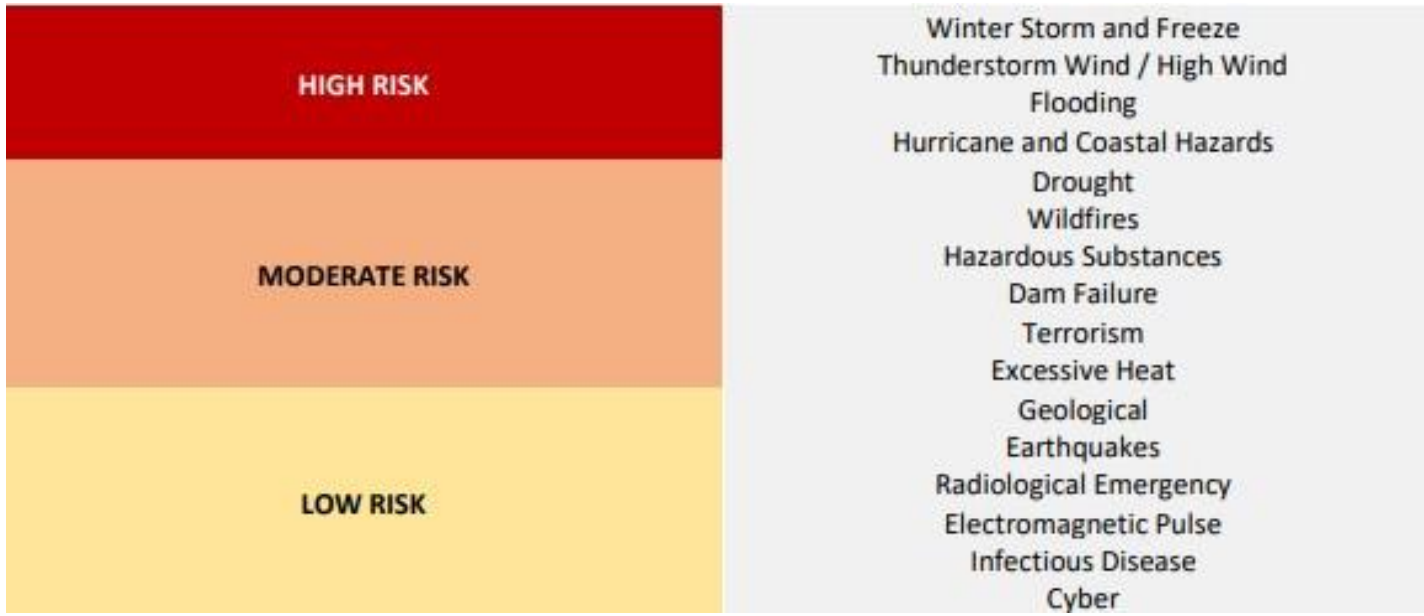
How Prepared Are We?

- Communities to Self-Assess Capability
- What Mitigation Actions are Feasible
- Where Gaps Exist

Plan Update Process
Step 2: Risk Assessment

Previously Identified Hazards (2020)

1. Drought	8. Geological (Erosion)
2. Excessive Heat	9. Cyber
3. Hurricane and Coastal Hazards	10. Wildfires
4. Tornadoes/Thunderstorms (Hailstorm, Lightning, Severe Thunderstorm)	11. Infectious Disease
5. Severe Winter Weather	12. Hazardous Substances
6. Dam Failures	13. Radiological Emergency
7. Flooding	14. Terrorism
8. Earthquakes	15. Electromagnetic Pulse



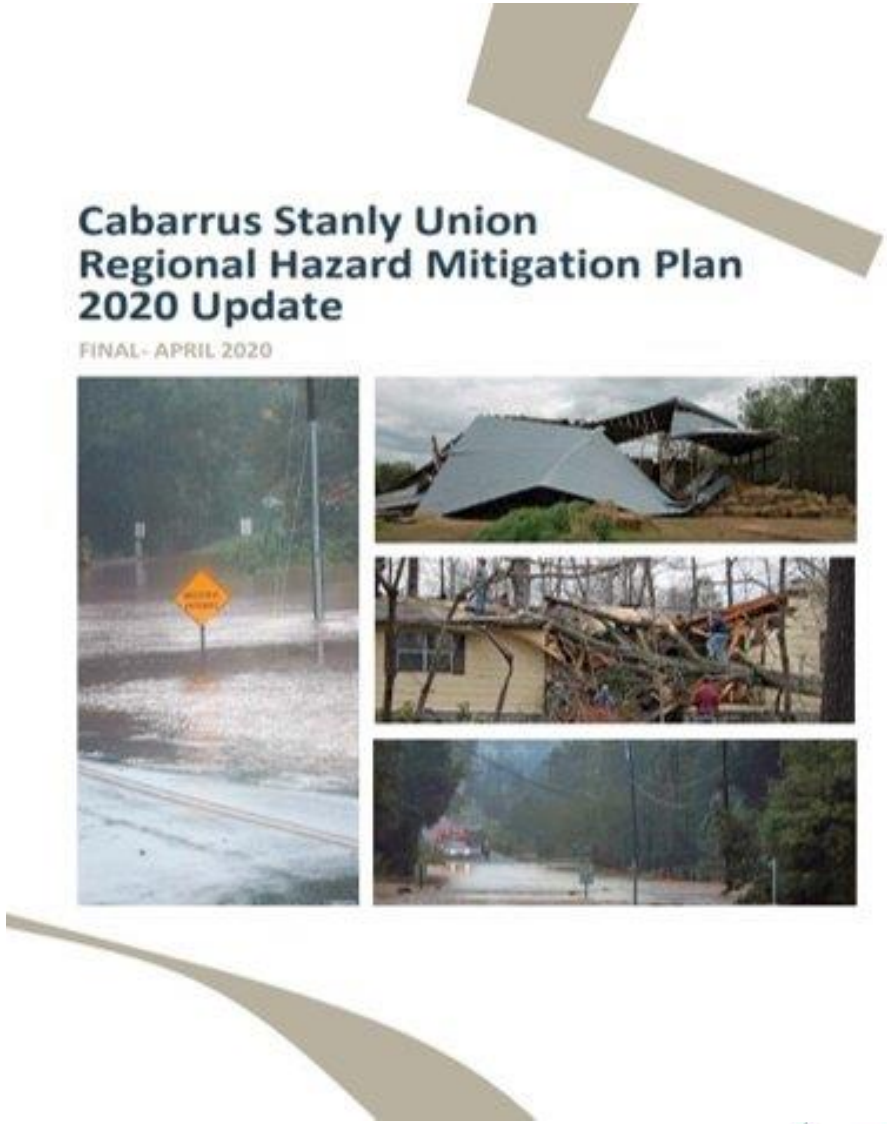
Plan Update Process
Step 3: Develop a Mitigation Plan

Setting Planning Goals

Reviewing Mitigation Alternatives

HMPC May Need to Develop New Actions

Drafting an Action Plan



Plan Update Process

Step 4: Adoption and Implementation

Seeking Review and Approval from Relevant Authorities

Securing Funding and Managing Resources of Mitigation Projects and Activities

Executing the Identified Mitigation Actions

Continuously Monitoring the Progress of Mitigation Activities

Initial Survey Findings

33% of respondents live in Unincorporated Stanly County, 13% live in Unincorporated Cabarrus County, and 13% live in Concord

33% of respondents are extremely concerned with the possibility of their community being impacted by a disaster and 60% are somewhat concerned.

47% of respondents selected Tornadoes/Thunderstorms as the highest threat to their neighborhood. 20% selected Hurricanes and Coastal Hazards. Other hazards of concern include flooding, cyber, and hazardous substances.

67% of respondents have taken measures to make their home/neighborhood more resistant to hazards.

60% of respondents do not know what office to contact to find out more information about reducing their risk to hazards in their area.

Initial Survey Findings

Respondents were asked to rank the importance of the 6 mitigation techniques (reviewed earlier in this presentation). Options included Not Important, Somewhat Important, and Very Important.

Very Important was selected as the majority (50%) ranking for all 6 techniques with the following rankings:

1. Prevention – 93%
2. Emergency Services – 87%
3. Natural Resource Protection – 80%
4. Structural Projects – 73%
5. Public Education and Outreach – 73%
6. Property Protection – 53% (46% selected Somewhat Important)

Project Schedule

Project Kickoff Date – 2/8/24

Larger Stakeholder Meeting – 3/13/24

Public Meeting #1 – Date TBD

Proposed Delivery of Draft – 12/16/24

Public Meeting #2 – Date TBD

Existing Plan Expiration Date – 6/16/25

Plan Website

- Project Team requests counties/municipalities post relevant project information and updates
  - Public Survey indicate online/social media is preferred method of information sharing (60%)
- Can be used as a Tool for HMPC Coordination and Public Outreach
- Ideas for Website Content (ESP can provide)
  - Upcoming Meeting Announcements
  - Meeting Agendas and Minutes
  - Public Survey
  - Draft Documents of Plan Update
  - Information on Identified Hazards
  - Opportunities to Provide Feedback

Next Steps

1. Record and analyze input received during Stakeholder Meeting
2. Share Public Survey on municipal and county websites
3. Select Date/Location of Public Meeting #1
4. Continue working on the Risk Assessment (underway)
5. Continue working on Capability Assessment (underway)
6. Mitigation Strategy Development Meeting (date TBD)
7. Actionable Items for Stakeholders
    a. Begin reviewing Mitigation Action Plan and updating status of each action (FEMA requirement)
    b. Brainstorm locations and dates for Public Meeting #1
    c. Reach out to smaller communities to engage/include in the process

Complete and Share the Public Survey!

Scan the QR Code for Access to the Public Survey!

Or ACCESS SURVEY HERE

Questions

Questions/Comments/Concerns

Brainstorming Questions

1. What are key concerns or challenges you believe should be addressed in the hazard mitigation plan update?
2. How can the community be better prepared for potential hazards or disasters in the future?
3. Are there any specific areas or infrastructure that you feel require additional consideration?
4. What role do you think community members should play in implementing hazard mitigation strategies (if any)?
5. Do you have any additional suggestions or feedback regarding the plan update that you would like to share at this time?

Adjourn – Thank you!

Contact Information:

- Nathan Slaughter - nslaughter@espassociates.com
- Hannah DeLude - hdelude@espassociates.com
- John Flores - jflores@espassociates.com

CABARRUS STANLY UNION COUNTIES

REGIONAL HAZARD MITIGATION PLAN 2024 UPDATE

QR CODE TO PUBLIC SURVEY

Background

The Cabarrus Stanly Union Regional Hazard Mitigation Plan aims to assess, reduce, and prepare for the impact of natural and man-made hazards in the region. The 2024 Plan Update involves the identification of vulnerabilities and prioritization of mitigation strategies to better prepare for, respond to, and recover from a hazardous event. Through collaboration and coordination, the Plan Update seeks to engage stakeholders, raise awareness, and facilitate measures to mitigate risk and build a safer, more resilient region for current and future generations.

What is Mitigation?

FEMA defines Hazard Mitigation as:
"Sustained action taken to reduce or eliminate long-term risk to human life and property from hazards."

1 *EXISTING*

Mitigate hazard impacts on existing development in our communities (i.e. houses, businesses, infrastructure, critical facilities)

2 *FUTURE*

Ensure future development is conducted in a manner that does not increase vulnerability (i.e. strategic planning, policy, and procedures)

Disaster Mitigation Act of 2000

The Disaster Mitigation Act (DMA) of 2000 represents a major shift from reactive response to proactive prevention requiring local communities to develop/maintain hazard mitigation plans.

- **Revitalized Federal Planning Requirements**
  - State and Local Hazard Mitigation Plans
- **Federal Grant Funding Eligibility**
  - Hazard Mitigation Grant Program (HMGP)
  - Building Resilient Infrastructure and Communities (BRIC)
  - Flood Mitigation Assistance (FMA)

**Plans should be updated every 5 years to remain current.

Mitigation Techniques

1. Prevention - Planning and Zoning, Building Codes, Floodplain Regulations
2. Property Protection -Aquisition, Relocation, Elevation
3. Natural Resource Management - Floodplain Protection, Watershed Management, Riparian Buffers
4. Structural Projects - Reservoirs, Levees/Dams, Channel Modification
5. Emergency Services - Warning Systems, Evacuation Planning, Shelters
6. Public Education and Awareness - Outreach Projects, Real Estate Disclosures, Hazard Map Information

Task 1 Scope: Plan Development

Subtask	Status	Notes
Task 1.1: Planning Process	**In Progress**	Involves internal kickoff, planning team meetings (3 minimum), and public meetings (2 minimum).
Task 1.2: Risk Assessment	**In Progress**	Update previously developed risk assessment with latest data for hazard profiles and risk assessment techniques.
Task 1.3: Capability Assessment	**In Progress**	Project team to update previous capability assessment survey from last update. Communities to confirm changes and revise as needed.
Task 1.4: Mitigation Strategy	**In Progress**	Update status of existing mitigation actions from previous plan and propose new actions based on need.
Task 1.5: Plan Maintenance Procedures	**Not Started**	Includes analysis of previous methods/schedules of plan monitoring, evaluating, and updating.

Task 1.1: Meeting Breakdown

HAZARD MITIGATION PLANNING TEAM MEETINGS BREAKDOWN

First Meeting

- Introduce plan update process and roles
- Preliminary data collection efforts for risk assessment
- Proposed outline of the HMP
- Draft copy of Public Survey

Second Meeting

- Preliminary results of risk assessment
- Building consensus of goals and actions
- Implementation status of existing actions
- Propose new actions to be included in update

Third Meeting

- Review the initial draft of the plan update
- Emphasis on completion of mitigation strategy
- Summary of public meetings and input
- Refine proposed actions and projects

Fourth Meeting (Optional)

- If there is a need to cover required items that were not covered in the previous 3 meetings

An internal meeting was held on February 8th, 2024 with stakeholders from all counties present. During this meeting, it was agreed upon that in-person meetings will be hosted in each county on a rotating schedule starting in Union County on March 13th, 2024. The dates and location of the subsequent meetings remain TBD at this time. The first public meeting must be held within **60 days** from this meeting.

Next Steps and Upcoming Items

- Continue to share and encourage completion of the Public Survey
- Brainstorm goals and actions for the plan update
- Review/Revise Capability Assessment Survey (to be completed by project team)
- Update the status of existing mitigation actions ("Ongoing" has been deemed too vague by FEMA)
- Propose new mitigation actions to address the current needs of the community in the face of climate change
- Determine a time and location for Public Meeting #1 (within 60 days of March 13th meeting)
- Determine a time and location for Planning Team Meeting #2 (following completion of risk assessment)

Thank you!

Thank you for your participation in the Cabarrus Stanly Union Regional HMP 2024 Update!

Combined HIRA/Mitigation Strategy Meeting
July 11th, 2024
10:00am – 12:00pm
Kannapolis, NC

I. Meeting Objectives

a. IDENTIFY HAZARDS
b. ASSESS HAZARDS AND VULNERABILITY
c. DETERMINE POTENTIAL IMPACTS AND PRIORITIES
d. DISCUSS FINDINGS
e. EDUCATE AND INFORM

II. Hazard Identification and Risk Assessment

a. IDENTIFIED HAZARDS
b. PROFILED HAZARD EVENTS
c. INVENTORIED ASSETS
d. ESTIMATED LOSSES

III. Capability Assessment

a. CAPABILITY INDICATORS
b. CAPABILITY OVERALL RATINGS
c. SUBSTANTIAL DAMAGE ESTIMATES (SDE) PROCEDURES

IV. Mitigation Strategy

a. PRIORITY RISK INDEX (PRI) SCORES
b. MITIGATION GOALS
c. MITIGATION ALTERNATIVES (EXISTING AND NEW)
d. MITIGATION ACTION PLAN

V. Initial Public Survey Results

a. TOTAL RESPONSES TO DATE
b. KEY FINDINGS

VI. Next Steps

a. SUBMIT UPDATED AND NEW MITIGATION ACTIONS
b. REVIEW DRAFT CAPABILITY ASSESSMENT
c. PROVIDE SDE PROCEDURES
d. SCHEDULE PUBLIC MEETING(S)
e. SUBMIT DRAFT PLAN MID-DECEMBER 2024

Combined HIRA/Mitigation Strategy Meeting
July 11th, 2024
10:00am – 12:00pm
Kannapolis, NC

The HIRA and Mitigation Strategy Meeting for the Cabarrus Stanly Union Hazard Mitigation Plan Update was the second official meeting of the planning process. Nathan Slaughter from ESP, led the meeting, emphasizing the importance of maximizing attendees' time by covering multiple elements of the risk and capability assessment findings, as well as the mitigation strategy. Special thanks were extended to Cabarrus County for hosting the meeting. Participants included both in-person attendees and those joining online, with a sign-in sheet circulated for documentation purposes.

The meeting's objectives were to identify hazards, assess vulnerabilities, determine potential impacts, and discuss findings. The HIRA process was outlined as a 10-step approach where five steps would be tackled during the meeting: assessing the hazard, evaluating the problem, setting goals, reviewing possible activities, and drafting action plan items.

During the hazard identification segment, it was noted that there have been 11 FEMA Major Disaster Declarations in total, with no single hazard dominating the region. The findings included the addition of two new hazards—civil disturbance and food emergency—consistent with the state plan. Hazards such as avalanches, tsunamis, and volcanoes were excluded from the plan due to varying rationales.

The hazard profiles highlighted 18 different hazards, detailing background information, historical occurrences, and vulnerability assessments. The asset inventory included population data and the exposure of parcels and buildings. Among the key findings, excessive heat and severe winter weather were identified as the highest-risk hazards, followed by tornadoes, thunderstorms, hurricanes, and flooding. The group discussed the significant public health impacts of excessive heat, noting its classification as a leading natural hazard killer despite a lack of direct property impact.

Further discussions included the risk assessment of hurricanes and coastal hazards, tornadoes, thunderstorms, flooding, and wildfires. The meeting also addressed emerging threats, such as infectious diseases and cyberattacks, highlighting the need to monitor and assess the probability and impact of such hazards. Comments from attendees emphasized the necessity of focusing on infrastructure vulnerabilities, particularly regarding power outages and the impact of flooding on transportation and utilities.

During the discussion on infectious diseases, a comment was raised regarding the potential to change the classification of infectious disease from "unlikely" to "possible," as well as adjusting the duration associated with it. This change could elevate its risk profile above that of wildfires. Nathan

Slaughter responded by noting that the assessment will be revisited qualitatively to ensure that all scoring accurately reflects the hazards discussed during the meeting.

The meeting transitioned into the Mitigation Strategy section, where objectives and capability assessments were reviewed. The region is characterized by either high or moderate capabilities in terms of community readiness to implement and maintain mitigation activities. Nathan outlined the plan update process, which includes several steps: coordinating efforts, conducting hazard/risk/capability assessments, and developing mitigation strategies.

The capability assessment utilized indicators to evaluate community readiness, and a spreadsheet was previously distributed for self-reporting on capabilities. Updates to this data are ongoing. Nathan shared insights on the initial capability assessments for Cabarrus, Stanly, and Union counties, revealing a range of high and moderate capability jurisdictions across the region.

Discussion turned to FEMA requirements regarding capability assessments, specifically relating to floodplain management and substantial damage estimate procedures. Nathan emphasized the importance of capturing this data for all cities and counties and clarified that the assessments focus on structures damaged by flooding events.

The impact on mitigation actions was also discussed, highlighting the need to rate hazards of major concern. The mitigation strategy development process was outlined, indicating that all action plans need to be revisited as part of the update. Data indicates every dollar spent on mitigation saves six dollars on future damages. The group reviewed different types of mitigation techniques and examples, including those aimed at heat, severe storms, and flooding.

Looking ahead, the project schedule was shared, with key dates including the kickoff on March 13, 2024, and the anticipated delivery of the draft plan on December 16, 2024. Nathan encouraged participants to think about the adoption process for their jurisdictions, as all must adopt the updated plan to remain eligible for FEMA funding. There will be a public meeting, although the specific dates are yet to be determined.

All attendees were encouraged to review all jurisdictional action plans rather than just their own, as the collective efforts are crucial for the overall effectiveness of the mitigation strategy. Further updates would be provided regarding public engagement opportunities and the next in-person meeting (likely once a draft is ready). The meeting adjourned with team contact information shared.

Cabarrus Stanly Union Region

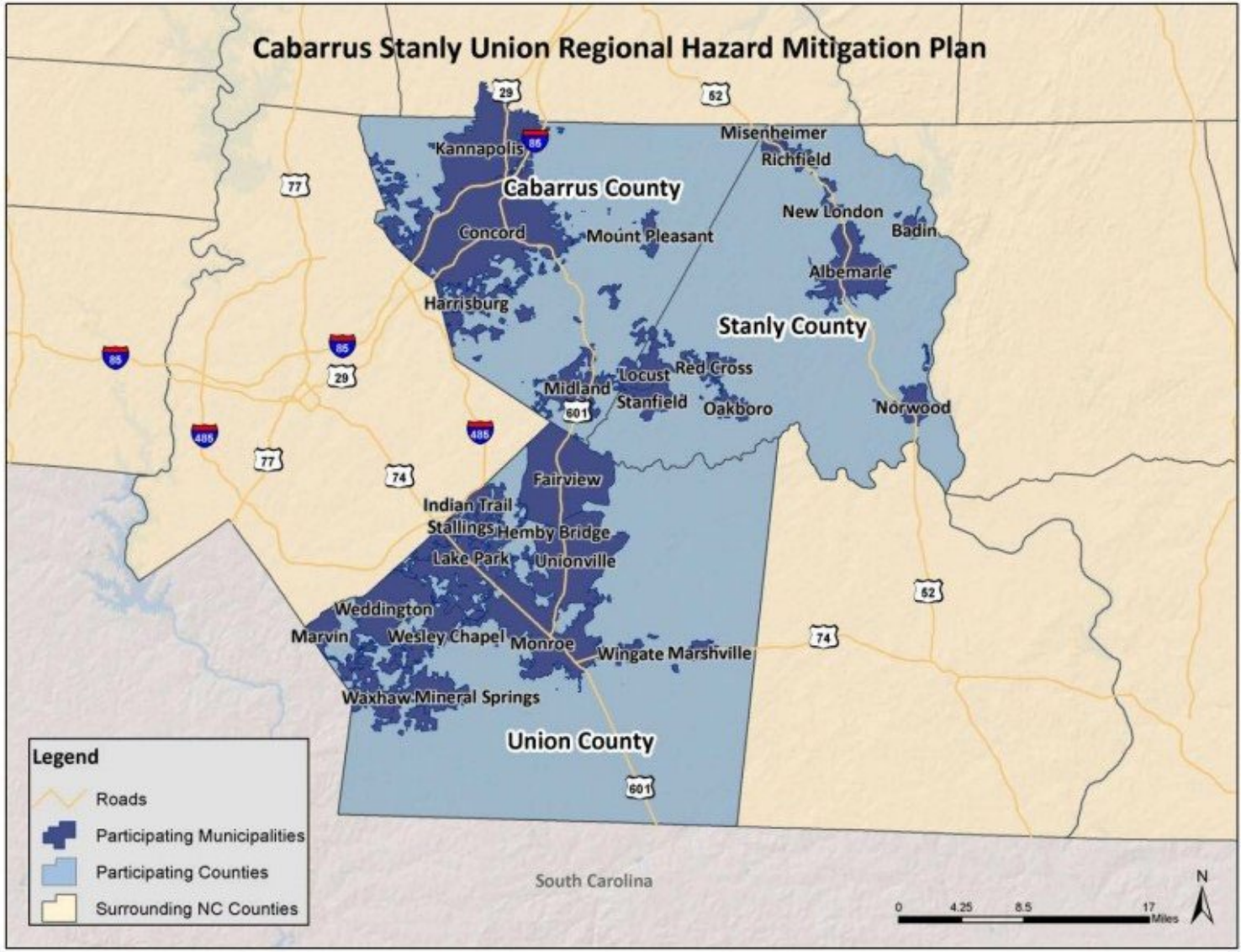
2025 Hazard Mitigation Plan Update

HIRA/Mitigation Strategy Meeting

July 11, 2024

Cabarrus County Milestone Building

Kannapolis, NC



Agenda

- Welcome & Introductions
- Meeting Objectives
- Hazard Identification
- Asset Inventory
- Hazard Profiles: Risk & Vulnerability
- Discuss Findings
- Capability Assessment Findings
- Mitigation Strategy
- Next Steps & Questions

Introductions

Welcome!

Reminder to Sign-In

Introductions: Project Team and Participants

HIRA Meeting Objectives

Identify Hazards

Assess Hazards and Vulnerability

Determine Potential Impacts & Priorities

Discuss Findings

Educate and Inform

Planning Process

- Step 1: Organize to Prepare the Plan
- Step 2: Involve the Public (*ongoing*)
- Step 3: Coordinate (*ongoing*)
- **Step 4: Assess the Hazard (current)**
- **Step 5: Assess the Problem (current)**
- **Step 6: Set Goals**
- **Step 7: Review Possible Activities**
- **Step 8: Draft an Action Plan**
- Step 9: Adopt the Plan
- Step 10: Implement, Evaluate, & Revise the Plan

Hazard Identification & Risk Assessment (HIRA) Process

Risk = a combination of hazard, vulnerability, and exposure; each factor is assessed in the process

1. Identify Hazards
2. Profile Hazard Events
3. Inventory Assets
4. Estimate Losses

44 CFR Requirement
44 CFR Part 201.6(c)(2)(i): The risk assessment shall include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan must include information on previous occurrences of hazard events and on the probability of future hazard events.

Hazard Identification

FEMA Major Disaster Declarations

Year	Disaster #	Description	Cabarrus County	Stanly County	Union County
1989	827	Tornadoes			X
1989	844	Hurricane Hugo	X	X	X
1996	1087	Blizzard of 96	X	X	X
1996	1134	Hurricane Fran		X	
1999	1292	Hurricane Floyd		X	X
2000	1312	Severe Winter Storm	X	X	X
2002	1448	Severe Ice Storm	X	X	X
2004	1546	Tropical Storm Frances	X		X
2018	4393	Hurricane Florence			X
2020	4487	COVID-19 Pandemic	X	X	X
2020	4543	Severe Storms, Tornadoes, and Flooding		X	

Total Declarations: **11**

- Categories
  - Hurricanes and coastal storms (5)
  - Severe winter weather (3)
  - Tornadoes and thunderstorms (2)
  - Pandemic (1)

Review of Existing Plan Hazards

Hazard	Included in 2023 State HMP?	Included in 2020 CSU Plan?	Included in 2025 CSU Plan Update?
Flooding	X	X	X
Hurricanes and Coastal Hazards	X	X	X
Severe Winter Weather (Freezing Rain, Snowstorms, Blizzards, Wind Chill, Extreme Cold)	X	X	X
Excessive Heat	X	X	X
Earthquake	X	X	X
Wildfire	X	X	X
Dam Failure	X	X	X
Drought	X	X	X
Tornadoes/Thunderstorms (Thunderstorm Wind, High Wind, Hail, Lightning)	X	X	X
Geological (Landslides, Sinkholes, Erosion)	X	X	X
Hazardous Substances	X	X	X
Radiological Emergency	X	X	X
Terrorism	X	X	X
Infectious Disease	X	X	X
Cyber Threat	X	X	X
Electromagnetic Pulse	X	X	X
Civil Disturbance (new)	X		X
Food Emergency (new)	X		X

Hazard Identification

Hazards Not Included

- Avalanche
- Nor'easter
- Expansive Soils
- Land Subsidence
- Tsunami
- Volcano
- Storm Surge

The rationale for not incorporating certain hazards may include **no geographic relevance, applicability to previous state/regional hazard mitigation plans, and poor availability of risk data**

Hazards Profiled

1. Drought
2. Excessive Heat
3. Hurricane and Coastal Hazards
4. Tornadoes/Thunderstorms
5. Severe Winter Weather
6. Earthquakes
7. Geological
8. Dam Failure
9. Flooding
10. Wildfire
11. Infectious Disease
12. Hazardous Substances
13. Radiological Emergency
14. Terrorism
15. Cyber
16. Electromagnetic Pulse
17. Civil Disturbance
18. Food Emergency

Hazard Profiles to include:

- *Background*
- *Location*
- *Extent*
- *Historical Occurrences*
- *Probability of Future Occurrence/FEMA NRI info*
- *Changing Future Conditions*
- *Summaries by Jurisdiction*
- *Vulnerability Assessment*

44 CFR Requirement

44 CFR Part 201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description must include an overall summary of each hazard and its impact on the community. All plans approved after October 1, 2008, must also address NFIP insured structures that have been repetitively damaged by floods.

The plan should describe vulnerability in terms of: (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate; (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Asset Inventory

Asset Inventory – Population (2000-2022)

*__Note__: 2010 and 2020 counts from Decennial Census; 2021 and 2022 counts from 5-Year ACS Estimates

Location	2022 Estimate	2021 Estimate	2020	2010	% Change 2010-2020
Cabarrus County	**226,396**	**221,200**	**225,804**	**178,535**	**26.5%**
Concord	105,335	102,566	105,240	75,172	40.0%
Harrisburg	18,934	18,415	18,967	10,328	83.6%
Kannapolis	52,314	52,173	53,114	41,663	27.5%
Midland	4,675	4,519	4,684	2,978	57.3%
Mount Pleasant	1,776	1,981	1,671	1,727	-3.2%
Unincorporated Area	43,362	41,546	42,128	46,667	-9.7%
Stanly County	**62,723**	**62,148**	**62,504**	**60,585**	**3.2%**
Albemarle	16,444	16,318	16,432	15,912	3.3%
Badin	2,075	1,919	2,024	1,774	14.1%
Locust	4,700	4,275	4,537	2,959	53.3%
Misenhiemer	652	702	650	920	-29.3%
New London	674	660	607	621	-2.3%
Norwood	2,906	2,648	2,367	2,122	11.5%
Oakboro	2,379	2,319	2,128	1,912	11.3%
Red Cross	677	686	762	740	3.0%
Richfield	921	871	582	464	25.4%
Stanfield	1,463	1,453	1,585	1,573	0.8%
Unincorporated Area	29,832	30,297	30,830	31,588	-2.4%
Union County	**240,109**	**235,699**	**238,267**	**201,292**	**18.4%**
Fairview	3,512	3,475	3,456	3,323	4.0%
Hemby Bridge	1,924	1,957	1,614	1,570	2.8%
Indian Trail	40,325	39,603	39,997	30,362	31.7%
Lake Park	3,342	3,317	3,269	3,243	0.8%
Marshville	2,565	2,533	2,522	2,391	5.5%
Marvin	6,421	6,326	6,358	4,889	30.0%
Mineral Springs	3,185	3,129	3,159	2,553	23.7%
Monroe	34,897	34,464	34,562	32,297	7.0%
Stallings	16,193	15,932	16,112	12,682	27.0%
Unionville	6,694	6,634	6,643	5,853	13.5%
Waxhaw	20,665	19,645	20,534	8,754	134.6%
Weddington	13,173	12,851	13,181	9,207	43.2%
Wesley Chapel	8,763	8,661	8,681	6,702	29.5%
Wingate	4,061	3,830	4,055	3,398	19.3%
Unincorporated Area	74,389	73,342	74,124	74,068	0.1%
Cabarrus Stanly Union Regional Total	**529,228**	**519,047**	**526,575**	**440,412**	**19.6%**

Asset Inventory – Parcels & Building Exposure (2010+)

***Note**: building footprints were originally provided in 2010 with a limited extent of updates since

Location	Estimated Number of Parcels	Total Assessed Value of Parcels	Estimated Number of Buildings	Total Assessed Value of Improvements
Cabarrus County	**106,941**	**$48,327,305,896**	**77,604**	**$35,489,731,655**
Concord	41,990	$24,641,333,240	27,886	$18,504,616,520
Harrisburg	8,735	$4,748,861,050	3,947	$3,499,666,050
Kannapolis	24,925	$8,469,011,771	15,322	$6,282,926,370
Midland	3,003	$1,009,728,140	1,883	$667,707,170
Mount Pleasant	898	$403,124,640	950	$287,135,170
Unincorporated Area	27,390	$9,055,247,055	27,616	$6,247,680,375
Stanly County	**42,247**	**$7,369,985,294**	**39,625**	**$4,922,116,984**
Albemarle	9,387	$1,553,816,201	8,253	$1,268,521,614
Badin	914	$70,714,941	776	$54,916,417
Locust	3,129	$802,564,429	1,485	$504,488,843
Misenhiemer	158	$107,325,499	203	$97,211,165
New London	399	$81,630,374	438	$67,077,663
Norwood	2,389	$322,433,183	1,601	$194,847,913
Oakboro	1,495	$276,991,744	1,013	$224,123,825
Red Cross	506	$82,576,681	571	$59,096,424
Richfield	512	$104,162,599	457	$78,953,289
Stanfield	864	$178,011,770	823	$133,589,693
Unincorporated Area	22,494	$3,789,757,873	24,005	$2,239,290,138
Union County	**111,043**	**$36,726,401,500**	**98,023**	**$27,022,430,900**
Fairview	2,080	$676,349,310	2,596	$428,910,900
Hemby Bridge	854	$161,695,000	1,155	$117,578,800
Indian Trail	17,073	$5,383,787,000	13,256	$4,062,315,600
Lake Park	1,409	$357,793,800	1,273	$292,255,100
Marshville	1,218	$194,158,600	1,644	$148,411,900
Marvin	2,308	$1,542,910,700	1,760	$1,179,220,800
Mineral Springs	1,570	$418,157,600	1,863	$309,587,600
Monroe	15,742	$4,504,476,600	14,891	$3,319,374,000
Stallings	7,571	$2,354,935,300	5,905	$1,788,732,900
Unionville	3,051	$784,643,600	3,595	$560,701,000
Waxhaw	8,196	$3,118,343,000	3,791	$2,386,168,300
Weddington	4,814	$3,050,413,100	3,484	$2,295,642,800
Wesley Chapel	3,012	$1,279,096,600	2,685	$957,152,600
Wingate	1,174	$250,547,400	1,138	$208,399,400
Unincorporated Area	40,971	$12,649,093,890	38,987	$8,967,979,200
Cabarrus Stanly Union Regional Total	**260,231**	**$92,423,692,690**	**215,252**	**$67,434,279,539**

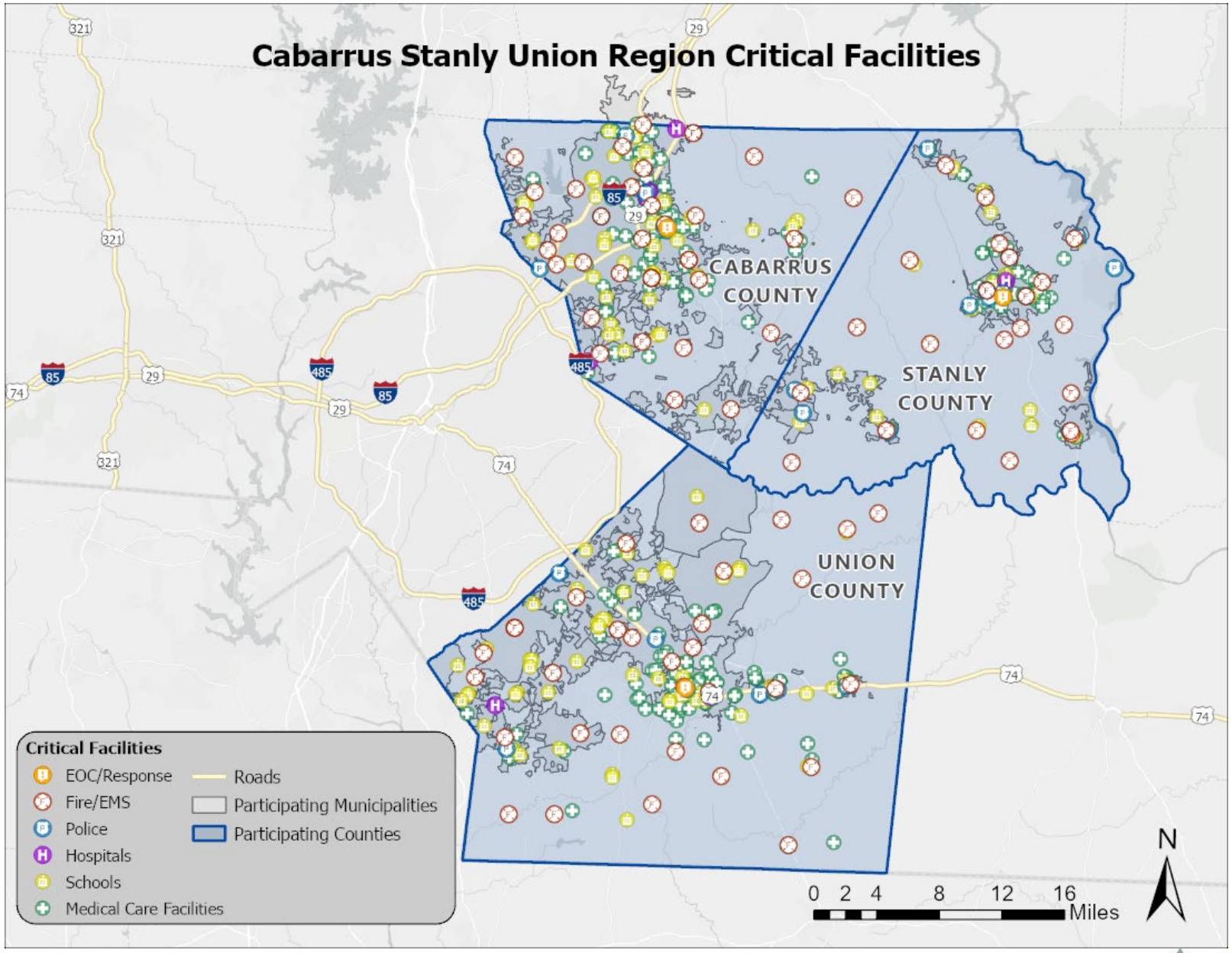
Asset Inventory – Critical Facilities

***Note**: approximate counts using available georeferenced facility data (NC OneMap, 2023) and updated municipal boundaries

Location	Fire/EMS Stations	Police Stations	Medical Care Facilities	EOC	Schools	Other
Cabarrus County	**34**	**8**	**88**	**1**	**45**	**12**
Concord	17	7	52	1	22	9
Harrisburg	3	0	3	0	4	0
Kannapolis	4	1	18	0	11	2
Midland	2	0	0	0	1	0
Mount Pleasant	2	0	3	0	3	1
Unincorporated Area	6	0	12	0	4	0
Stanly County	**22**	**14**	**52**	**1**	**22**	**8**
Albemarle	5	7	44	1	6	7
Badin	1	1	0	0	1	0
Locust	1	1	0	0	1	0
Misenhiemer	0	1	0	0	1	0
New London	1	0	1	0	1	0
Norwood	2	1	2	0	1	0
Oakboro	1	1	1	0	1	0
Red Cross	0	0	0	0	0	0
Richfield	1	0	1	0	1	0
Stanfield	0	1	0	0	1	0
Unincorporated Area	10	1	3	0	8	1
Union County	**32**	**7**	**100**	**1**	**53**	**15**
Fairview	1	0	0	0	1	0
Hemby Bridge	1	0	0	0	0	0
Indian Trail	1	0	7	0	9	0
Lake Park	0	0	0	0	0	1
Marshville	1	1	3	0	2	1
Marvin	0	0	1	0	1	0
Mineral Springs	1	0	0	0	1	0
Monroe	5	2	57	1	9	8
Stallings	0	1	0	0	1	0
Unionville	2	0	3	0	3	2
Waxhaw	1	1	4	0	3	1
Weddington	3	0	0	0	0	0
Wesley Chapel	1	0	0	0	2	0
Wingate	1	1	3	0	1	0
Unincorporated Area	14	1	22	0	20	2
Cabarrus Stanly Union Regional Total	**88**	**29**	**240**	**3**	**120**	**35**

Asset Inventory – Critical Facilities

*__Note__: approximate counts using available georeferenced facility data (NC OneMap, 2023) and updated municipal boundaries



Asset Inventory – Social Vulnerability

*__Note__: highest variable by county is shown in **bold**; FEMA National Risk Index (NRI) values are reported on a scale of 100 points

Variable	Cabarrus County	Stanly County	Union County
Percent of the population over age 5 that speaks a language other than English (2022 ACS 5-Year)	13.8%	6.5%	**15.6%**
Percent of the population that has a disability (2022 ACS 5-Year)	10.7%	**17.1%**	9.2%
Percent of the population that lives below the poverty level (2022 ACS 5-Year)	7.5%	**13.8%**	6.8%
Social Vulnerability Index (CDC/ATSDR, 2022)	0.2222 (low)	**0.3838 (low to med)**	0.0303 (low)
Environmental Justice Index (CDC/ATSDR, 2022)	**9 high-burden tracts**	4 high-burden tracts	6 high-burden tracts
Base Risk Index (FEMA NRI, 2024)	80.11	56.89	**86.06**
Social Vulnerability (FEMA NRI, 2024)	43.4 (moderate)	**55.4 (moderate)**	22.1 (low)
Community Resilience (FEMA NRI, 2024)	**72.6 (high)**	57.4 (moderate)	60.6 (high)

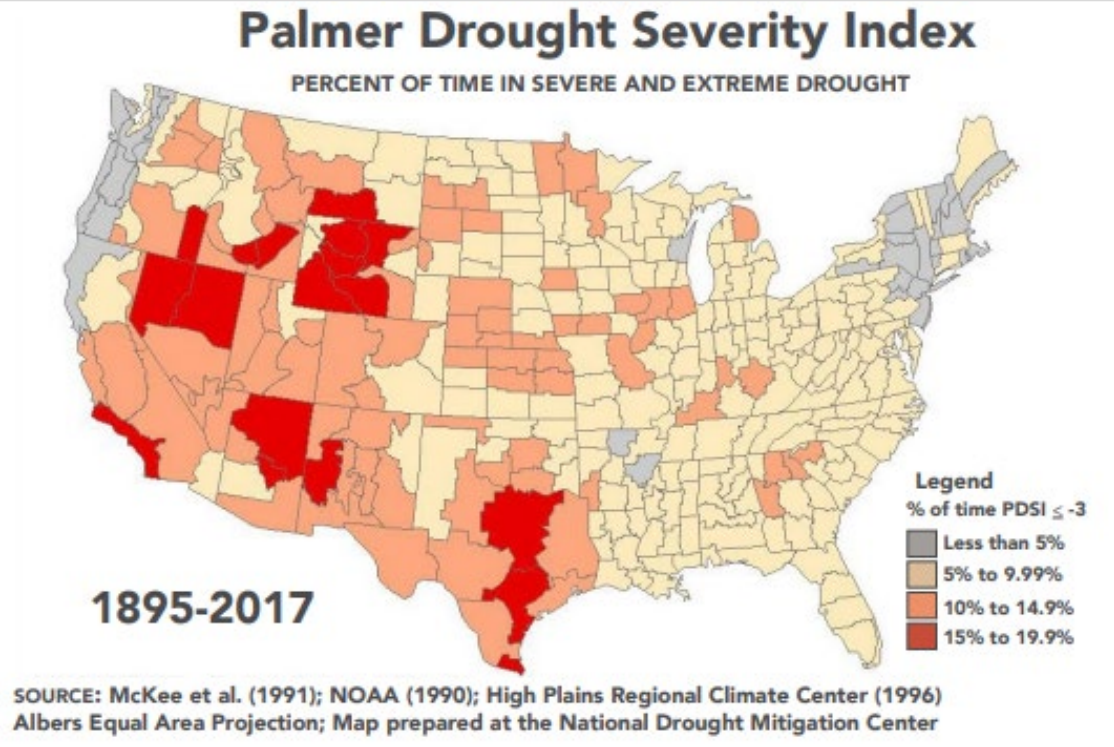
Hazard Profiles

Hazard Risk Summary

Hazard	Subhazard(s) Assessed	Category/Degree of Risk					
		Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Natural Hazards							
Drought	Agricultural, Hydrological	Likely	Minor	Large	More than 24 hours	More than 1 week	2.5
Excessive Heat		Likely	Critical	Large	More than 24 hours	Less than 1 week	3.0
Hurricane and Coastal Hazards	Storm Surge, Severe Weather	Possible	Critical	Large	More than 24 hours	Less than 1 week	2.7
Tornadoes/ Thunderstorms	High Wind, Hail, Lightning	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	2.8
Severe Winter Weather	Snow, Blizzards, Wind Chill, Extreme Cold, Freezing Rain	Likely	Critical	Large	More than 24 hours	Less than 1 week	3.0
Earthquakes		Possible	Limited	Moderate	Less than 6 hours	Less than 6 hours	2.3
Geological	Landslide, Sinkholes, Erosion	Possible	Limited	Small	Less than 6 hours	Less than 6 hours	2.1
Dam Failure		Unlikely	Critical	Moderate	Less than 6 hours	Less than 1 week	2.5
Flooding		Likely	Limited	Moderate	6 to 12 hours	Less than 1 week	2.7
Wildfires		Likely	Minor	Small	Less than 6 hours	More than 1 week	2.4
Infectious Disease	Foreign Animal Disease	Unlikely	Limited	Moderate	More than 24 hours	More than 1 week	2.0
Technological Hazards							
Hazardous Substances		Possible	Limited	Small	Less than 6 hours	Less than 24 hours	2.2
Radiological Emergency	Fixed Nuclear Facilities	Unlikely	Critical	Moderate	6 to 12 hours	Less than 1 week	2.4
Terrorism	Explosive, Chemical, Radiological, Biological, Nuclear	Possible	Critical	Small	Less than 6 hours	Less than 24 hours	2.5
Cyber		Possible	Limited	Moderate	Less than 6 hours	Less than 1 week	2.5
Electromagnetic Pulse		Unlikely	Critical	Moderate	12 to 24 hours	Less than 1 week	2.3
Civil Disturbance		Unlikely	Minor	Small	Less than 6 hours	Less than 24 hours	1.6
Food Emergency		Possible	Minor	Moderate	More than 24 hours	Less than 1 week	1.9

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Minor	Large	More than 24 hours	More than 1 week

Drought



Meteorological Drought	The degree of dryness or departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
Hydrologic Drought	The effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
Agricultural Drought	Soil moisture deficiencies relative to water demands of plant life, usually crops.
Socioeconomic Drought	The effect of demands for water exceeding the supply as a result of a weather-related supply shortfall.

Source: Multi-Hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy, FEMA

- **Droughts are slow-onset hazards**
  - Negative effects on crops, water supplies, recreational areas, and wildlife
  - If a drought extends over a longer period, the direct and indirect economic impacts can be significant
- **4 main types**:
  - Meteorological
  - Hydrological
  - Agricultural
  - Socioeconomic

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Minor	Large	More than 24 hours	More than 1 week

Drought

Location	Years with Drought Occurrences	Years with Exceptional Drought Occurrences
Cabarrus County	24	3
Stanly County	24	3
Union County	24	3

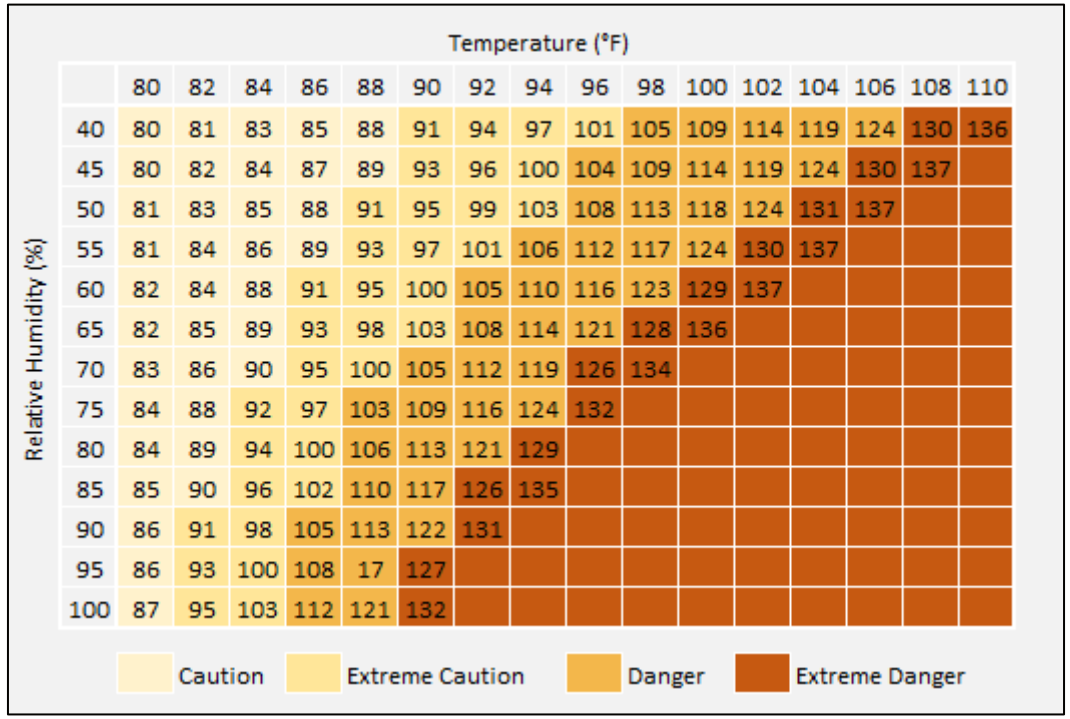
Source: North Carolina Drought Monitor (through February 2024)

Scale	Description	Impacts
D0	**Abnormally Dry**	- Short-term dryness slowing planting, growth of crops - Some lingering water deficits - Pastures or crops not fully recovered
D1	**Moderate Drought**	- Some damage to crops, pastures - Some water shortages developing - Voluntary water-use restrictions requested
D2	**Severe Drought**	- Crop or pasture loss likely - Water shortages common - Water restrictions imposed
D3	**Extreme Drought**	- Major crop/pasture losses - Widespread water shortages or restrictions
D4	**Exceptional Drought**	- Exceptional and widespread crop/pasture losses - Shortages of water creating water emergencies

- According to the North Carolina Drought Monitor, all the counties in the CSU Region have had some level of drought occurrences in 24 of the last 25 years (2000-2024)
  - **Exceptional drought** (D4) in 2002, 2007, and 2008
- Frequency and intensity of droughts are likely to continue to increase along with average temperatures
- **2024 FEMA National Risk Index (NRI) drought hazard risk ratings**:
  - Cabarrus – Very low
  - Stanly – Very low
  - Union – Relatively low

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Critical	Large	More than 24 hours	Less than 1 week

Excessive Heat



Relative Humidity (%)	Temperature (°F)															
	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	17	127										
100	87	95	103	112	121	132										

Source: NOAA, National Weather Service

Excessive heat leads the nation in terms of weather-related mortality. It has caused an average of **1,200** deaths each year nationwide.

- **Excessive heat** poses little risk to property but can have devastating impacts on public health
- Often referred to as "**extreme heat**" or a "**heat wave**"
- The National Weather Service developed the **Heat Index** (see left image) to better inform the public of heat dangers

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Critical	Large	More than 24 hours	Less than 1 week

Excessive Heat

NCEI EXCESSIVE HEAT OCCURRENCES

County	Number of Events	Deaths/Injuries	Property Damage (2023 dollars)
Cabarrus County	3	0/0	$0
Stanly County	1	0/0	$0
Union County	3	0/0	$0
Cabarrus Stanly Union Regional Total	**7**	**0/0**	**$0**

Source: NCEI

MAX RECORDED TEMPERATURES BY COUNTY

Location	Date	Temperature (°F)
Cabarrus County	8/22/1983	107
Stanly County	7/28/1940	109
Union County	8/21/1983	107
Cabarrus Stanly Union Regional Maximum	--	109

Source: State Climate Office of North Carolina

AVERAGE MAX TEMPERATURE IN CONCORD, CABARRUS COUNTY (MOST CENTRALIZED STATION)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Avg. Max (°F)	70.4	73.5	81.3	88.2	92.2	96.8	98.4	97.3	94.1	87.1	79.0	71.2

Source: State Climate Office of North Carolina

- **2024 FEMA NRI excessive heat hazard ratings**:
  - Cabarrus – Relatively moderate
  - Stanly – Relatively low
  - Union – Relatively low
- According to 2022 climate summary data from NOAA:
  - NC average temps have risen over 1°F since the 20th century
  - Temps have consistently risen above averages since the late 1990s
  - Recent summer average temps were warmest on record for the last 16 years (2005-2020)
  - Future heat waves are likely to be more intense

Probability	Impact	Spatial Extent	Warning Time	Duration
Possible	Critical	Large	More than 24 hours	Less than 1 week

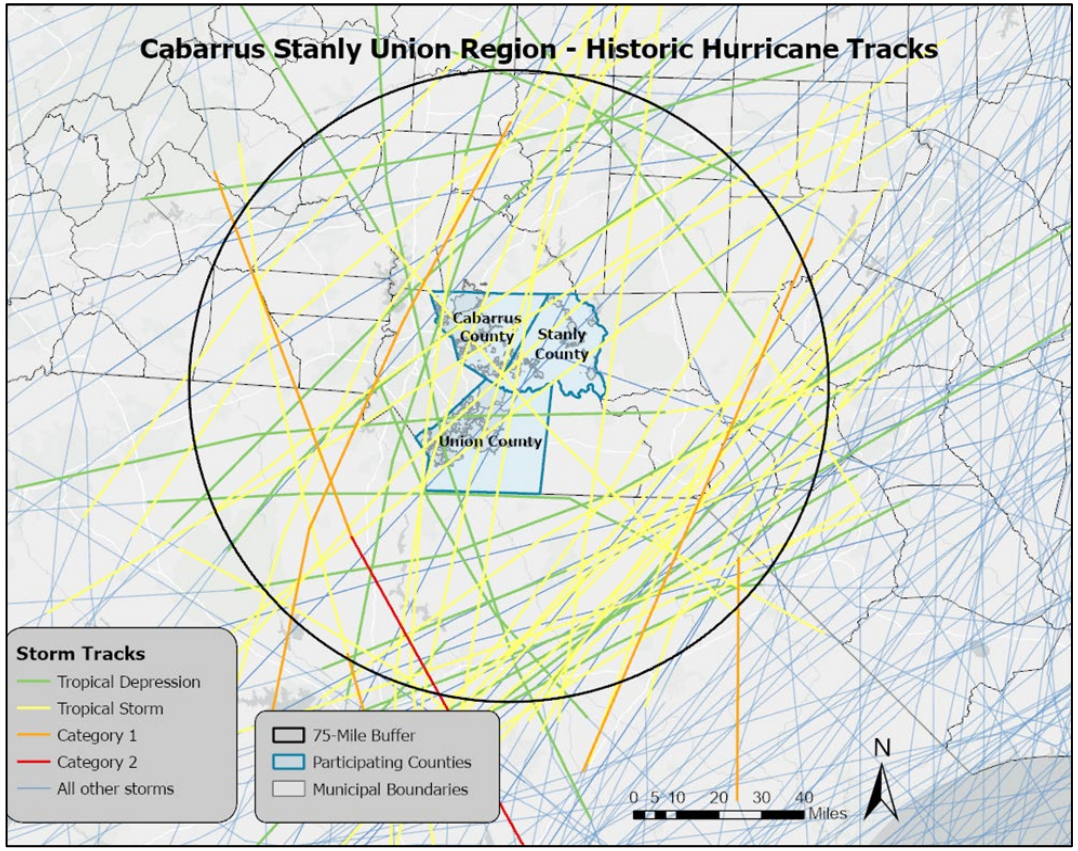
Hurricane & Coastal Hazards

Category	Damage Level	Description of Damages	Photo Example
1	MINIMAL	No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Also, some coastal flooding and minor pier damage.	
2	MODERATE	Some roofing material, door, and window damage. Considerable damage to vegetation, mobile homes, etc. Flooding damages piers and small craft in unprotected moorings may break their moorings.	
3	EXTENSIVE	Some structural damage to small residences and utility buildings, with a minor amount of curtainwall failures. Mobile homes are destroyed. Flooding near the coast destroys smaller structures, with larger structures damaged by floating debris. Terrain may be flooded well inland.	
4	EXTREME	More extensive curtainwall failures with some complete roof structure failure on small residences. Major erosion of beach areas. Terrain may be flooded well inland.	
5	CATASTROPHIC	Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. Flooding causes major damage to lower floors of all structures near the shoreline. Massive evacuation of residential areas may be required.	

Source: National Hurricane Center; Federal Emergency Management Agency

Probability	Impact	Spatial Extent	Warning Time	Duration
Possible	Critical	Large	More than 24 hours	Less than 1 week

Hurricane & Coastal Hazards



Source: National Oceanic and Atmospheric Administration; National Hurricane Center

A hurricane-level storm makes landfall in NC roughly **once every 3 years**.

- North Carolina is vulnerable to hurricanes and tropical storms beyond the Atlantic coast
- Per the National Hurricane Center, **69 hurricane or tropical storm tracks have passed within 75 miles of the CSU Region** since 1850
  - 13 tracks directly crossed
- Climate models project that hurricane-associated storm intensity and rainfall rates will increase in the future
- **2024 FEMA NRI hurricane hazard ratings**:
  - Cabarrus – Relatively low
  - Stanly – Relatively low
  - Union – Relatively low

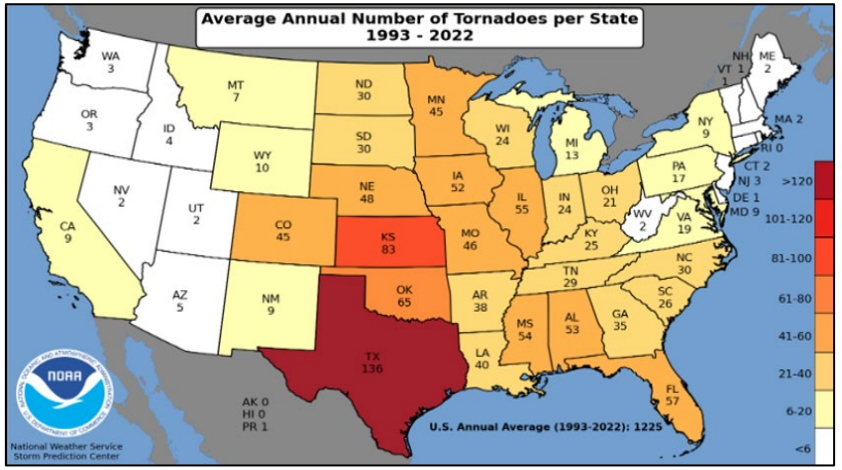
Hurricane & Coastal Hazards – Building Loss Estimates from 100-year Hurricane Winds (NCEM)

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**39,349**	**74,586**	**$24,519,683**	**6,843**	**$13,687,721**	**1,535**	**$3,264,712**	**82,964**	**$41,472,116**
Concord	9,968	24,811	$9,111,389	2,540	$8,852,497	576	$1,375,608	27,927	$19,339,494
Harrisburg	3,298	3,354	$1,441,852	650	$625,986	110	$215,649	4,114	$2,283,488
Kannapolis	16,838	18,848	$6,242,571	1,431	$1,474,130	431	$954,165	20,710	$8,670,866
Midland	1,144	1,629	$391,872	157	$117,365	30	$32,524	1,816	$541,760
Mount Pleasant	1,499	1,568	$372,258	143	$151,951	53	$30,571	1,764	$554,780
Unincorporated Area	6,602	24,376	$6,959,741	1,922	$2,465,792	335	$656,195	26,633	$10,081,728
Stanly County	**29,570**	**34,111**	**$11,356,985**	**4,294**	**$3,391,399**	**791**	**$1,054,104**	**39,196**	**$15,802,488**
Albemarle	6,685	6,554	$1,569,497	1,388	$376,840	214	$178,987	8,156	$2,125,324
Badin	762	646	$136,090	86	$120,663	34	$28,976	766	$285,728
Locust	1,582	1,527	$382,124	232	$88,911	36	$43,788	1,795	$514,823
Misenhiemer	169	158	$40,138	11	$1,918	29	$29,292	198	$71,348
New London	703	647	$255,771	80	$82,578	25	$8,193	752	$346,542
Norwood	2,080	1,918	$1,286,882	206	$339,951	45	$152,892	2,169	$1,779,725
Oakboro	1,237	1,186	$309,334	205	$88,769	39	$20,441	1,430	$418,543
Red Cross	397	513	$142,238	39	$7,984	15	$23,058	567	$173,281
Richfield	930	877	$205,046	141	$41,391	24	$5,223	1,042	$251,661
Stanfield	891	862	$228,078	125	$127,648	23	$5,732	1,010	$361,458
Unincorporated Area	14,134	19,223	$6,801,787	1,781	$2,114,746	307	$557,522	21,311	$9,474,055
Union County	**33,932**	**82,141**	**$42,737,884**	**5,880**	**$13,728,681**	**1,385**	**$5,212,625**	**89,406**	**$61,679,188**
Fairview	1,248	2,213	$781,330	166	$282,131	63	$97,200	2,442	$1,160,660
Hemby Bridge	631	852	$171,467	62	$45,937	25	$17,467	939	$234,872
Indian Trail	2,038	11,266	$3,404,024	854	$549,276	115	$43,775	12,235	$3,997,075
Lake Park	3	1,182	$363,284	14	$55,262	5	$535	1,201	$419,081
Marshville	1,491	1,535	$1,028,774	220	$362,535	43	$479,978	1,798	$1,871,287
Marvin	143	1,598	$1,410,859	42	$49,696	10	$13,989	1,650	$1,474,544
Mineral Springs	642	1,377	$286,446	96	$67,142	31	$16,985	1,504	$370,573
Monroe	7,037	11,060	$5,319,444	1,754	$1,234,485	244	$1,304,436	13,058	$7,858,365
Stallings	2,078	5,120	$1,885,982	365	$132,051	22	$9,142	5,507	$2,027,174
Unionville	1,733	3,134	$1,344,377	190	$598,959	108	$162,397	3,432	$2,105,733
Waxhaw	676	3,099	$997,581	187	$71,525	35	$18,596	3,321	$1,087,703
Weddington	673	3,520	$2,119,562	107	$147,846	59	$25,210	3,686	$2,292,617
Wesley Chapel	440	2,715	$1,138,183	36	$38,857	29	$39,161	2,780	$1,216,201
Wingate	536	902	$663,822	41	$13,697	64	$128,326	1,007	$805,844
Unincorporated Area	14,563	32,568	$21,822,749	1,746	$10,079,282	532	$2,855,428	34,846	$34,757,459
Cabarrus Stanly Union Regional Total	**102,851**	**190,838**	**$78,614,552**	**17,017**	**$30,807,801**	**3,711**	**$9,531,441**	**211,566**	**$118,953,792**

Probability	Impact	Spatial Extent	Warning Time	Duration
Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours

Tornadoes / Thunderstorms – Tornado

*__Note__: National Centers for Environmental Information (NCEI) records only include those officially reported by the agency. It is highly likely that additional events and damages have occurred that are not captured in this data.



Source: NOAA Storm Prediction Center

ENHANCED FUJITA (EF) SCALE

EF-Scale Number	Intensity Phrase	3 Second Gust (MPH)	Type of Damage Done
0	Gale	65-85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
1	Moderate	86-110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
2	Significant	111-135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
3	Severe	136-165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
4	Devastating	166-200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
5	Incredible	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile-sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

- **North Carolina averages 30 tornadoes per year**, with formation most likely between March-May
- Tornado magnitude is reported according to the Enhanced Fujita Scale (effective 2005) shown in the table
- Per NCEI, tornadoes have resulted in 51 recorded events up to category F4 and over $108 million (2023 dollars) in property damages in the region since 1950*
  - 1 death, 30 injuries
- Total number of tornadoes is not significantly different from the past, but clustering appears to be increasing
- **2024 FEMA NRI tornado hazard ratings**:
  - Cabarrus – Relatively moderate
  - Stanly – Relatively low
  - Union – Relatively high

Tornadoes / Thunderstorms – Building Loss Estimates from F2 Tornado (NCEM)

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**39,349**	**74,586**	**$8,742,387,899**	**6,843**	**$6,740,809,158**	**1,535**	**$1,554,583,104**	**82,964**	**$17,037,780,160**
Concord	9,968	24,811	$3,221,556,718	2,540	$3,846,849,929	576	$661,789,159	27,927	$7,730,195,805
Harrisburg	3,298	3,354	$511,781,898	650	$438,059,825	110	$115,054,213	4,114	$1,064,895,935
Kannapolis	16,838	18,848	$2,021,324,447	1,431	$1,007,143,054	431	$421,753,442	20,710	$3,450,220,943
Midland	1,144	1,629	$158,772,018	157	$100,218,483	30	$23,195,954	1,816	$282,186,456
Mount Pleasant	1,499	1,568	$144,084,088	143	$86,057,302	53	$38,252,495	1,764	$268,393,885
Unincorporated Area	6,602	24,376	$2,684,868,730	1,922	$1,262,480,565	335	$294,537,841	26,633	$4,241,887,136
Stanly County	**29,570**	**34,111**	**$3,122,037,385**	**4,294**	**$1,723,904,599**	**791**	**$468,387,477**	**39,196**	**$5,314,329,462**
Albemarle	6,685	6,554	$593,064,088	1,388	$557,856,033	214	$135,727,965	8,156	$1,286,648,086
Badin	762	646	$49,611,345	86	$72,583,203	34	$44,002,275	766	$166,196,824
Locust	1,582	1,527	$138,837,063	232	$76,563,731	36	$25,490,251	1,795	$240,891,044
Misenhiemer	169	158	$13,208,091	11	$1,865,242	29	$29,572,757	198	$44,646,090
New London	703	647	$84,718,946	80	$61,819,200	25	$10,818,525	752	$157,356,671
Norwood	2,080	1,918	$179,963,316	206	$63,464,456	45	$20,270,489	2,169	$263,698,261
Oakboro	1,237	1,186	$102,556,274	205	$74,943,966	39	$14,522,533	1,430	$192,022,773
Red Cross	397	513	$48,529,535	39	$7,916,604	15	$16,989,639	567	$73,435,778
Richfield	930	877	$78,277,097	141	$50,651,726	24	$9,264,120	1,042	$138,192,943
Stanfield	891	862	$83,734,854	125	$61,279,807	23	$7,358,224	1,010	$152,372,885
Unincorporated Area	14,134	19,223	$1,749,536,776	1,781	$694,960,631	307	$154,370,699	21,311	$2,598,868,107
Union County	**33,936**	**82,166**	**$11,955,092,402**	**5,880**	**$3,640,202,459**	**1,385**	**$1,039,773,671**	**89,431**	**$16,635,068,534**
Fairview	1,248	2,213	$295,806,538	166	$130,296,700	63	$43,513,341	2,442	$469,616,580
Hemby Bridge	631	852	$69,724,647	62	$17,745,052	25	$8,126,226	939	$95,595,926
Indian Trail	2,038	11,266	$1,411,241,318	854	$420,239,990	115	$66,027,430	12,235	$1,897,508,738
Lake Park	3	1,182	$144,682,742	14	$14,574,820	5	$1,576,315	1,201	$160,833,877
Marshville	1,491	1,535	$142,951,322	220	$88,299,877	43	$37,195,621	1,798	$268,446,819
Marvin	143	1,606	$572,960,160	42	$18,068,482	10	$9,598,423	1,658	$600,627,066
Mineral Springs	642	1,377	$143,063,827	96	$47,008,128	31	$10,170,713	1,504	$200,242,668
Monroe	7,037	11,060	$1,183,462,749	1,754	$976,496,135	244	$175,414,425	13,058	$2,335,373,309
Stallings	2,078	5,120	$727,485,959	365	$170,524,471	22	$8,147,118	5,507	$906,157,548
Unionville	1,733	3,134	$411,790,873	190	$213,385,505	108	$75,716,803	3,432	$700,893,181
Waxhaw	676	3,100	$479,209,178	187	$59,117,980	35	$20,199,946	3,322	$558,527,104
Weddington	673	3,520	$912,384,476	107	$40,657,219	59	$46,110,674	3,686	$999,152,369
Wesley Chapel	440	2,715	$510,824,169	36	$22,788,506	29	$20,198,448	2,780	$553,811,123
Wingate	536	902	$102,173,339	41	$8,740,090	64	$47,289,451	1,007	$158,202,880
Unincorporated Area	14,567	32,584	$4,847,331,105	1,746	$1,412,259,504	532	$470,488,737	34,862	$6,730,079,346
Cabarrus Stanly Union Regional Total	**102,855**	**190,863**	**$23,819,517,686**	**17,017**	**$12,104,916,216**	**3,711**	**$3,062,744,252**	**211,591**	**$38,987,178,156**

Probability	Impact	Spatial Extent	Warning Time	Duration
Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours

Tornadoes / Thunderstorms – Thunderstorm Wind

NCEI THUNDERSTORM / HIGH WIND EVENTS

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Cabarrus County	**226**	**0/0**	**$2,113,202**
Concord	53	0/0	$386,421
Harrisburg	23	0/0	$183,743
Kannapolis	23	0/0	$126,647
Midland	11	0/0	$93,695
Mount Pleasant	12	0/0	$60,728
Unincorporated Area	104	0/0	$1,261,968
Stanly County	**197**	**0/3**	**$3,918,306**
Albemarle	47	0/3	$3,548,850
Badin	6	0/0	$28,443
Locust	8	0/0	$12,216
Misenhiemer	0	0/0	$0
New London	11	0/0	$26,151
Norwood	13	0/0	$14,436
Oakboro	10	0/0	$102,155
Red Cross	5	0/0	$47,578
Richfield	6	0/0	$2,501
Stanfield	10	0/0	$46,727
Unincorporated Area	78	0/0	$89,249
Union County	**250**	**0/1**	**$2,382,775**
Fairview	11	0/0	$2,879
Hemby Bridge	0	0/0	$0
Indian Trail	11	0/0	$66,892
Lake Park	0	0/0	$0
Marshville	16	0/0	$66,792
Marvin	2	0/0	$0
Mineral Springs	7	0/0	$26,707
Monroe	48	0/0	$498,838
Stallings	6	0/0	$1,888
Unionville	10	0/0	$423,842
Waxhaw	28	0/0	$1,152,720
Weddington	8	0/0	$30,291
Wesley Chapel	3	0/0	$0
Wingate	8	0/0	$8,349
Unincorporated Area	92	0/1	$103,577
Cabarrus Stanly Union Regional Total	**673**	**0/4**	**$8,414,283**

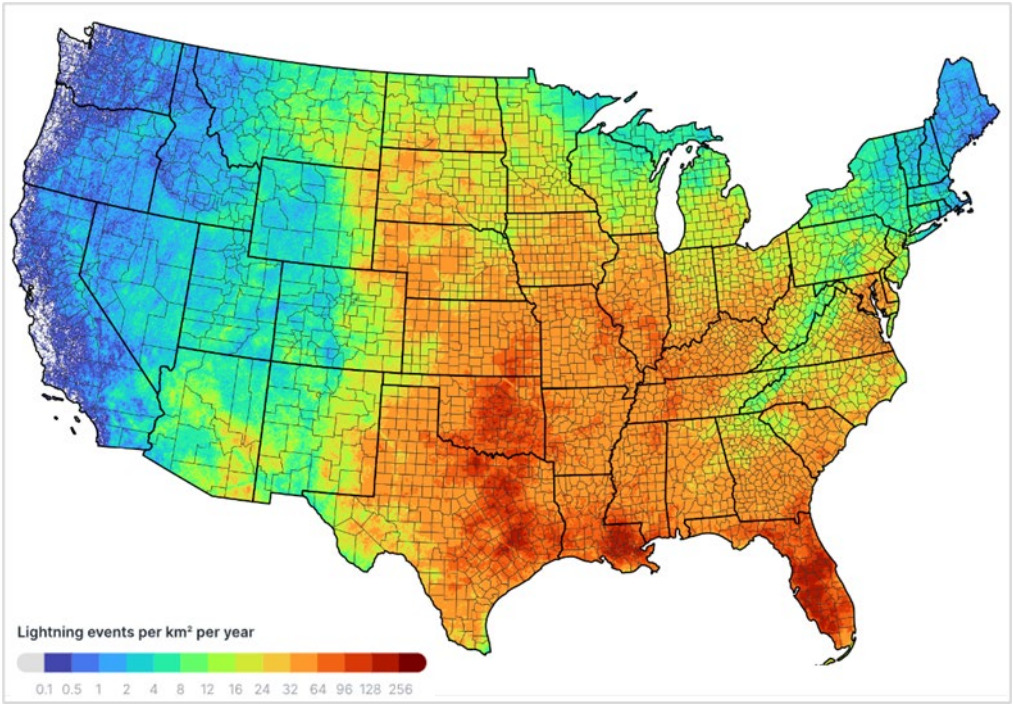
- Although thunderstorms generally affect a small area, they are very dangerous and may cause severe property damage
- According to the NWS, **100,000+ thunderstorms occur each year**
  - **≈10%** are “severe”
  - Uniform exposure due to atmospheric conditions
- According to NASA, severe storm events are likely to become more frequent and intense throughout the Southeast U.S. over time
- **2024 FEMA NRI strong wind hazard ratings**:
  - Cabarrus – Relatively moderate
  - Stanly – Relatively low
  - Union – Relatively high

Tornadoes / Thunderstorms – Building Loss Estimates from 50-year Thunderstorm Winds (NCEM)

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**39,349**	**74,586**	**$24,744,365**	**6,843**	**$13,764,592**	**1,535**	**$3,280,289**	**82,964**	**$41,789,246**
Concord	9,968	24,811	$9,111,389	2,540	$8,852,497	576	$1,375,608	27,927	$19,339,494
Harrisburg	3,298	3,354	$1,441,852	650	$625,986	110	$215,649	4,114	$2,283,488
Kannapolis	16,838	18,848	$6,242,571	1,431	$1,474,130	431	$954,165	20,710	$8,670,866
Midland	1,144	1,629	$391,872	157	$117,365	30	$32,524	1,816	$541,760
Mount Pleasant	1,499	1,568	$372,258	143	$151,951	53	$30,571	1,764	$554,780
Unincorporated Area	6,602	24,376	$7,184,423	1,922	$2,542,663	335	$671,772	26,633	$10,398,858
Stanly County	**29,570**	**34,111**	**$13,674,959**	**4,294**	**$4,564,143**	**791**	**$1,415,895**	**39,196**	**$19,654,998**
Albemarle	6,685	6,554	$2,581,391	1,388	$734,957	214	$365,998	8,156	$3,682,345
Badin	762	646	$214,926	86	$262,171	34	$60,736	766	$537,832
Locust	1,582	1,527	$421,570	232	$96,817	36	$70,832	1,795	$589,219
Misenhiemer	169	158	$63,076	11	$3,501	29	$58,544	198	$125,121
New London	703	647	$412,726	80	$139,336	25	$16,583	752	$568,645
Norwood	2,080	1,918	$799,014	206	$194,334	45	$84,152	2,169	$1,077,500
Oakboro	1,237	1,186	$504,946	205	$161,955	39	$38,223	1,430	$705,125
Red Cross	397	513	$228,674	39	$16,689	15	$48,740	567	$294,104
Richfield	930	877	$329,720	141	$85,172	24	$10,018	1,042	$424,911
Stanfield	891	862	$291,557	125	$162,654	23	$9,833	1,010	$464,044
Unincorporated Area	14,134	19,223	$7,827,359	1,781	$2,706,557	307	$652,236	21,311	$11,186,152
Union County	**33,932**	**82,141**	**$34,782,709**	**5,880**	**$9,158,910**	**1,385**	**$2,959,005**	**89,406**	**$46,900,624**
Fairview	1,248	2,213	$781,330	166	$282,131	63	$97,200	2,442	$1,160,660
Hemby Bridge	631	852	$171,467	62	$45,937	25	$17,467	939	$234,872
Indian Trail	2,038	11,266	$3,404,024	854	$549,276	115	$43,775	12,235	$3,997,075
Lake Park	3	1,182	$363,284	14	$55,262	5	$535	1,201	$419,081
Marshville	1,491	1,535	$664,315	220	$193,120	43	$293,451	1,798	$1,150,887
Marvin	143	1,598	$1,410,859	42	$49,696	10	$13,989	1,650	$1,474,544
Mineral Springs	642	1,377	$286,446	96	$67,142	31	$16,985	1,504	$370,573
Monroe	7,037	11,060	$3,479,070	1,754	$754,647	244	$490,219	13,058	$4,723,935
Stallings	2,078	5,120	$1,885,982	365	$132,051	22	$9,142	5,507	$2,027,174
Unionville	1,733	3,134	$1,401,050	190	$674,608	108	$249,137	3,432	$2,324,795
Waxhaw	676	3,099	$997,581	187	$71,525	35	$18,596	3,321	$1,087,703
Weddington	673	3,520	$2,119,562	107	$147,846	59	$25,210	3,686	$2,292,617
Wesley Chapel	440	2,715	$1,138,183	36	$38,857	29	$39,161	2,780	$1,216,201
Wingate	536	902	$412,278	41	$6,885	64	$67,286	1,007	$486,449
Unincorporated Area	14,563	32,568	$16,267,278	1,746	$6,089,927	532	$1,576,852	34,846	$23,934,058
Cabarrus Stanly Union Regional Total	**102,851**	**190,838**	**$73,202,033**	**17,017**	**$27,487,645**	**3,711**	**$7,655,189**	**211,566**	**$108,344,868**

Probability	Impact	Spatial Extent	Warning Time	Duration
Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours

Tornadoes / Thunderstorms – Lightning



Source: Vaisala U.S. National Lightning Detection Network, 2016-2022

- **Lightning strikes** are highly localized and may damage buildings, critical facilities, natural resources, and infrastructure by igniting a fire
- Per NCEI, lightning has resulted in 31 recorded events and over $3.1 million (2023 dollars) in property damages in the region since 1994
  - 8 injuries
- CSU Region averages **8-16 lightning events per square kilometer per year** (2016-2023 Vaisala NLDN data)
- **2024 FEMA NRI lightning hazard ratings**:
  - Cabarrus – Relatively low
  - Stanly – Relatively low
  - Union – Relatively moderate

Probability	Impact	Spatial Extent	Warning Time	Duration
Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours

Tornadoes / Thunderstorms – Hail

TORRO HAILSTORM INTENSITY SCALE

	Intensity Category	Typical Hail Diameter (mm)*	Probable Kinetic Energy, J-m²	mm to inch conversion (inches)	Typical Damage Impacts
H0	Hard Hail	5	0-20	0 – 0.2	No damage
H1	Potentially Damaging	5-15	>20	0.2 – 0.6	Slight general damage to plants, crops
H2	Significant	10-20	>100	0.4 – 0.8	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	>300	0.8 – 1.2	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40	>500	1.0 – 1.6	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	>800	1.2 – 2.0	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60		1.6 – 2.4	Bodywork of grounded aircraft dented, brick walls pitted
H7	Destructive	50-75		2.0 – 3.0	Severe roof damage, risk of serious injuries
H8	Destructive	60-90		1.6 – 3.5	(Severest recorded in the British Isles) Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100		3.0 – 3.9	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100			Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

- **Hailstorms** are a potentially damaging outgrowth of severe thunderstorms and form by ice crystallization of warm air updrafts
- Per NCEI, hail has resulted in 309 recorded events and over $334,328 (2023 dollars) in property damages in the region since 1959
  - 0.75-inch to 4.5-inch hail
- **2024 FEMA NRI hail hazard ratings**:
  - Cabarrus – Relatively moderate
  - Stanly – Relatively low
  - Union – Relatively moderate

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Critical	Large	More than 24 hours	Less than 1 week

Severe Winter Weather

NCEI WINTER WEATHER EVENTS

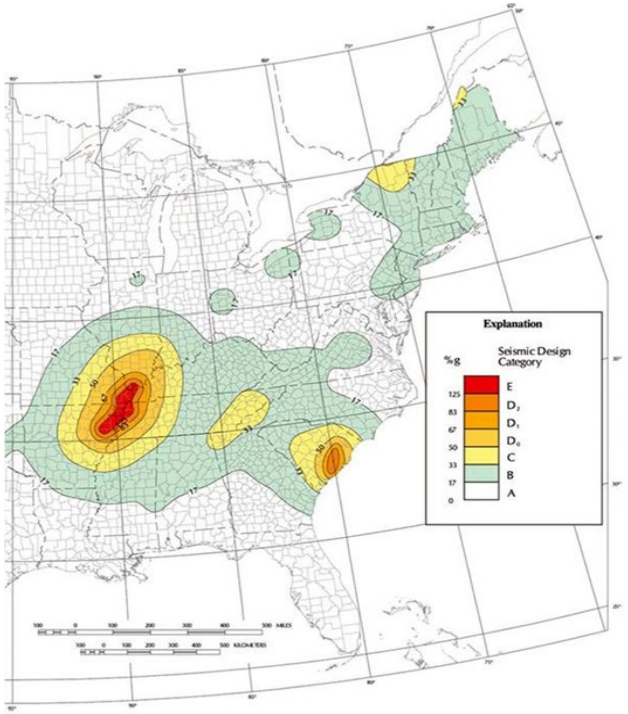
Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Cabarrus County	74	0/0	$20,430,363
Stanly County	47	0/0	$0
Union County	55	0/0	$19,476,027
Cabarrus Stanly Union Regional Total	176	0/0	$39,906,390

Severe winter weather is a top hazard in the nation in terms of weather-related mortality. Frigid winter conditions contribute to a high number of deaths and injuries each year. In recent years, **U.S. death rates have spiked by 8-12% in the winter months**.

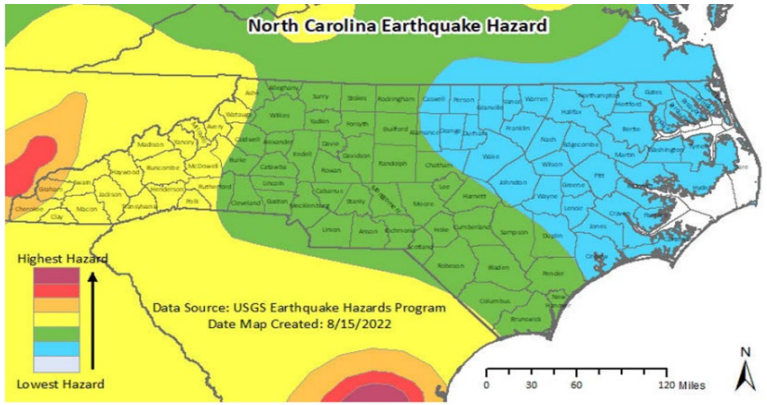
- A winter storm can range from moderate snowfall over a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days
- **Severe winter weather** can lead to dangerous driving conditions, communications and utility disruptions, and severe injuries
- Winter weather has resulted in 3 disaster declarations and 176 recorded events in the region since 1993 per NCEI records
- According to NOAA, average winter temps in urban hubs of NC have recently spiked by 2-3°F
- **2024 FEMA NRI winter weather hazard ratings**:
  - Cabarrus – Very low
  - Stanly – Very low
  - Union – Relatively moderate

Probability	Impact	Spatial Extent	Warning Time	Duration
Possible	Limited	Moderate	Less than 6 hours	Less than 6 hours

Earthquake



Source: United States Geological Survey



Source: North Carolina Geological Survey

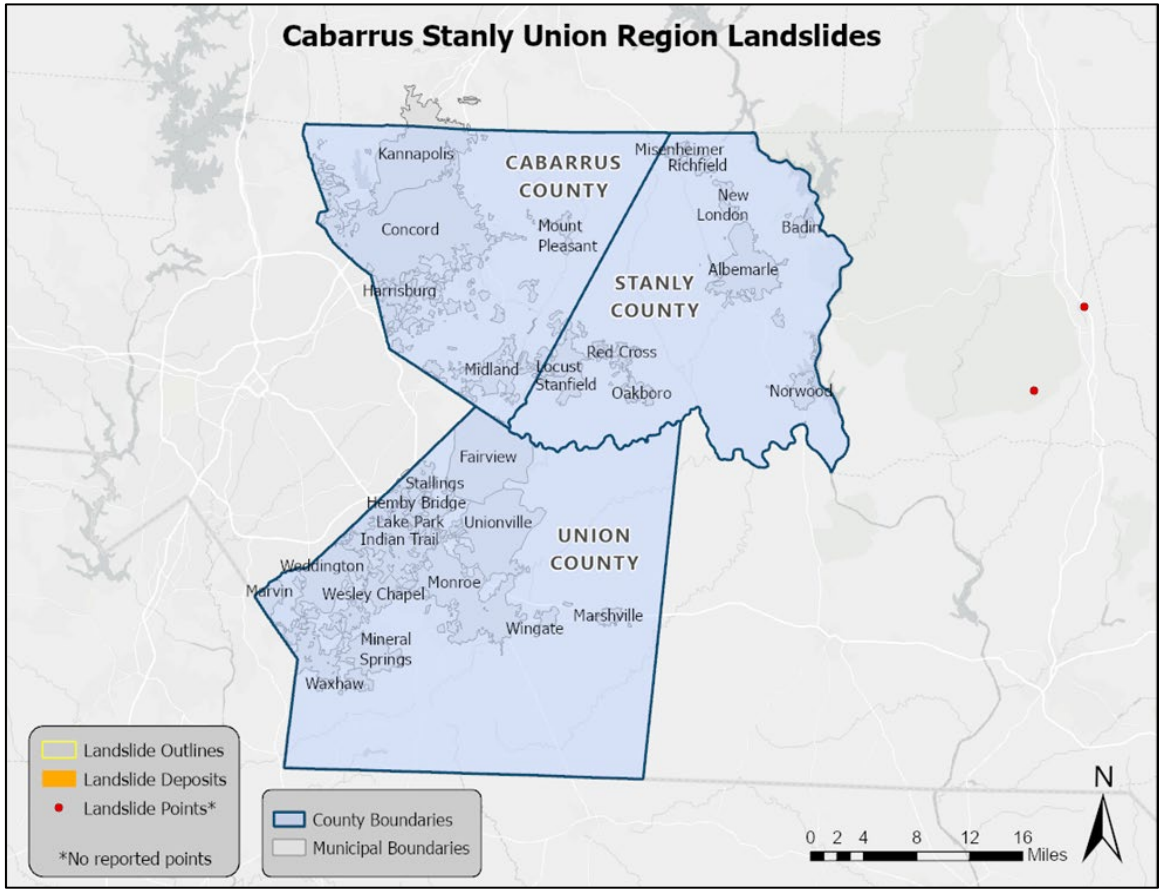
- **Moderate risk of less frequent, less intense earthquake events in the Eastern U.S.** vs. other regions
- Earthquakes are measured by magnitude (Richter) and intensity (Modified Mercalli Intensity)
- At least 16 earthquakes have affected the planning region since 1886
  - Strongest: VI (MMI)
  - Most: Cabarrus (7)
- USGS reports a 5-25% chance of a VI (MMI) or higher earthquake in NC using a 100-year return period (2023)
- **2024 FEMA NRI earthquake hazard ratings**:
  - Cabarrus – Relatively low
  - Stanly – Very low
  - Union – Relatively low

Earthquake – Building Loss Estimates from 500-Year Earthquake (NCEM)

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**39,349**	**74,586**	**$11,942,422**	**6,843**	**$22,453,759**	**1,535**	**$5,391,661**	**82,964**	**$39,787,841**
Concord	9,968	24,811	$4,691,928	2,540	$12,901,541	576	$2,373,371	27,927	$19,966,840
Harrisburg	3,298	3,354	$699,175	650	$1,500,432	110	$414,821	4,114	$2,614,428
Kannapolis	16,838	18,848	$2,719,534	1,431	$3,453,247	431	$1,381,467	20,710	$7,554,248
Midland	1,144	1,629	$229,988	157	$325,011	30	$94,063	1,816	$649,061
Mount Pleasant	1,499	1,568	$197,566	143	$292,879	53	$136,342	1,764	$626,787
Unincorporated Area	6,602	24,376	$3,404,231	1,922	$3,980,649	335	$991,597	26,633	$8,376,477
Stanly County	**29,570**	**34,111**	**$4,255,226**	**4,294**	**$5,717,388**	**791**	**$1,500,208**	**39,196**	**$11,472,819**
Albemarle	6,685	6,554	$774,865	1,388	$1,932,280	214	$444,057	8,156	$3,151,202
Badin	762	646	$56,562	86	$204,986	34	$123,880	766	$385,428
Locust	1,582	1,527	$196,163	232	$302,260	36	$85,446	1,795	$583,868
Misenhiemer	169	158	$14,408	11	$5,368	29	$81,098	198	$100,874
New London	703	647	$140,923	80	$224,462	25	$34,135	752	$399,520
Norwood	2,080	1,918	$276,990	206	$233,345	45	$72,544	2,169	$582,879
Oakboro	1,237	1,186	$151,003	205	$275,832	39	$51,426	1,430	$478,261
Red Cross	397	513	$67,489	39	$28,625	15	$60,782	567	$156,896
Richfield	930	877	$116,630	141	$136,922	24	$37,872	1,042	$291,423
Stanfield	891	862	$128,716	125	$228,286	23	$27,501	1,010	$384,502
Unincorporated Area	14,134	19,223	$2,331,477	1,781	$2,145,022	307	$481,467	21,311	$4,957,966
Union County	**33,936**	**82,166**	**$19,679,183**	**5,880**	**$16,466,352**	**1,385**	**$5,249,116**	**89,431**	**$41,394,655**
Fairview	1,248	2,213	$410,349	166	$474,397	63	$190,267	2,442	$1,075,012
Hemby Bridge	631	852	$99,669	62	$84,425	25	$37,207	939	$221,302
Indian Trail	2,038	11,266	$2,085,061	854	$1,983,452	115	$338,552	12,235	$4,407,065
Lake Park	3	1,182	$202,533	14	$66,902	5	$5,483	1,201	$274,918
Marshville	1,491	1,535	$249,141	220	$392,357	43	$203,644	1,798	$845,142
Marvin	143	1,606	$929,903	42	$87,952	10	$53,741	1,658	$1,071,596
Mineral Springs	642	1,377	$248,417	96	$279,359	31	$50,556	1,504	$578,333
Monroe	7,037	11,060	$2,210,419	1,754	$4,658,114	244	$827,667	13,058	$7,696,200
Stallings	2,078	5,120	$1,004,202	365	$832,790	22	$40,191	5,507	$1,877,184
Unionville	1,733	3,134	$628,576	190	$901,184	108	$372,631	3,432	$1,902,391
Waxhaw	676	3,100	$817,478	187	$307,379	35	$106,730	3,322	$1,231,587
Weddington	673	3,520	$1,406,824	107	$221,651	59	$231,842	3,686	$1,860,317
Wesley Chapel	440	2,715	$811,551	36	$113,013	29	$95,872	2,780	$1,020,437
Wingate	536	902	$191,410	41	$47,869	64	$221,194	1,007	$460,474
Unincorporated Area	14,567	32,584	$8,383,650	1,746	$6,015,508	532	$2,473,539	34,862	$16,872,697
Cabarrus Stanly Union Regional Total	**102,855**	**190,863**	**$35,876,831**	**17,017**	**$44,637,499**	**3,711**	**$12,140,985**	**211,591**	**$92,655,315**

Probability	Impact	Spatial Extent	Warning Time	Duration
Possible	Limited	Small	Less than 6 hours	Less than 6 hours

Geological – Landslides, Sinkholes, Erosion



Source: North Carolina Geological Survey, Asheville Regional Office

- The **geological** hazard includes landslides, sinkholes, and erosion for consistency with the State HMP
- Some steep topography of the region makes it susceptible to landslides, although soil profiles suggest sinkholes and erosion are uncommon
- Landslide activity is limited in the region (no reports)
  - USGS has previously mapped large central areas of Cabarrus County and Stanly County at a high risk of incidence (1982)
- The number of landslides is projected to increase due to more extreme rainfall events
- **2024 FEMA NRI landslide hazard ratings**:
  - Cabarrus – Relatively moderate
  - Stanly – Relatively low
  - Union – Relatively low

Probability	Impact	Spatial Extent	Warning Time	Duration
Unlikely	Critical	Moderate	Less than 6 hours	Less than 1 week

Dam Failure

NC DAM HAZARD CLASSIFICATIONS

Hazard Classification	Description	Quantitative Guidelines
Low	Interruption of road service, low volume roads Less than 25 vehicles per day	Less than 25 vehicles per day
	Economic Damage	Less than $30,000
Intermediate	Damage to highways, Interruption of service	25 to less than 250 vehicles per day
	Economic Damage	$30,000 to less than $200,000
High	Loss of human life*	Probable loss of 1 or more human lives
	Economic Damage	More than $200,000
	*Probable loss of human life due to breached roadway or bridge on or below the dam	250 or more vehicles per day

Source: North Carolina Division of Energy, Mineral, and Land Resources

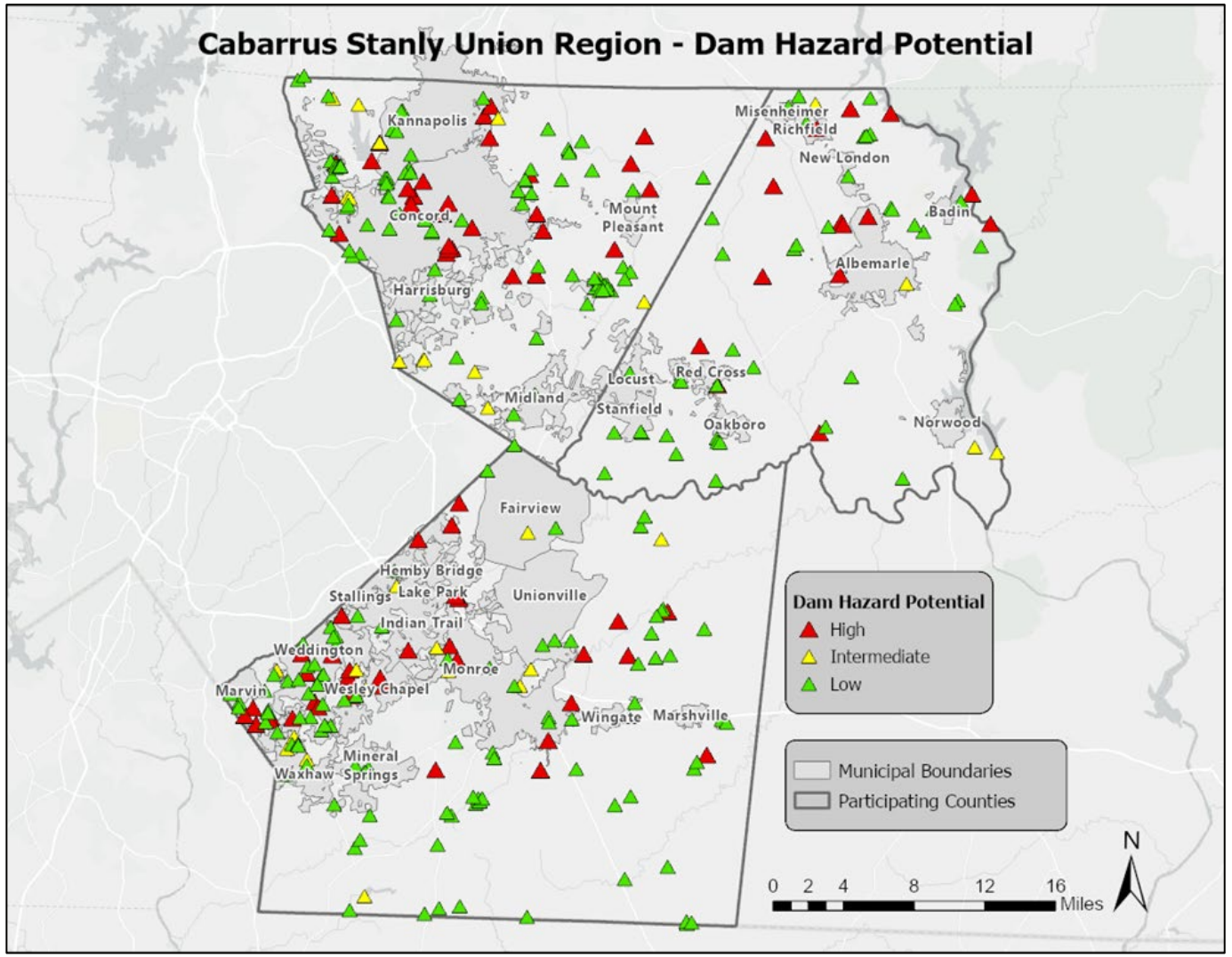
CSU REGION HIGH-HAZARD DAMS

Location	Number High Hazard Dams
Cabarrus County	29
Stanly County	15
Union County	35
Cabarrus Stanly Union Region Total	**79**

- Interest in **dam safety** has increased in recent years due to aging infrastructure, new hydrologic data, and population growth near downstream SFHAs
  - **FEMA priority**
- Although unlikely, dam failure carries serious risks as the energy of water stored behind even a small dam is capable of significant loss of life and property
- According to NCDEQ as of December 2023, there are **332 dams** in the CSU Region
  - **≈24%** are classified as high-hazard dams
- Projected increases in extreme weather could affect peak streamflow and structural integrity of dams

Probability	Impact	Spatial Extent	Warning Time	Duration
Unlikely	Critical	Moderate	Less than 6 hours	Less than 1 week

Dam Failure



Source: North Carolina Division of Energy, Mineral, and Land Resources, 2023

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Limited	Moderate	6 to 12 hours	Less than 1 week

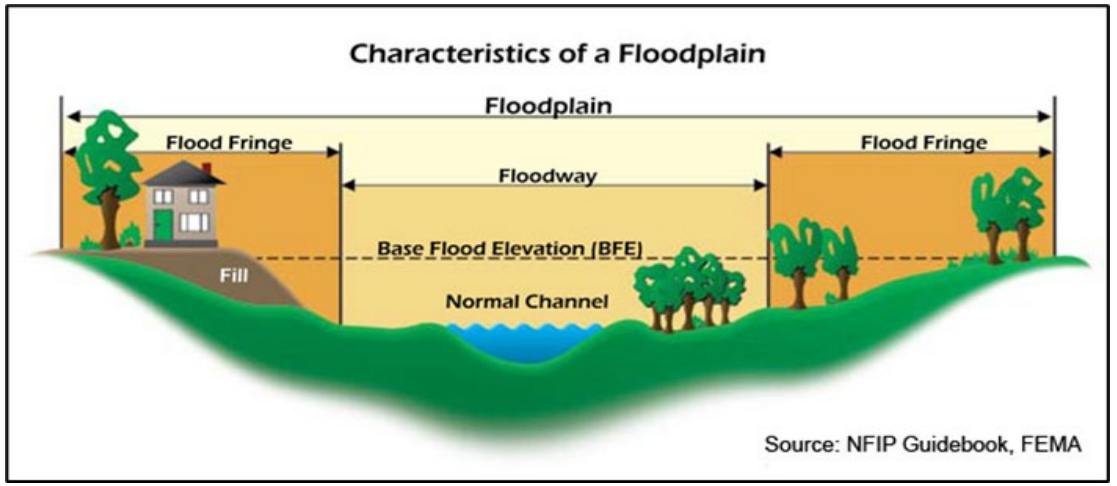
Flooding

SUMMARY OF FLOODPLAIN AREAS

Location	100-year area (square miles)	500-year area (square miles)
Cabarrus County	32.77	4.63
Stanly County	25.17	0.55
Union County	39.89	1.67
CABARRUS STANLY UNION REGION TOTAL	**97.83**	**6.85**

Source: Federal Emergency Management Agency, Map Service Center

These floodplain areas account for **≈4.4%** of the total land area in the CSU Region (≈2,357 square miles).

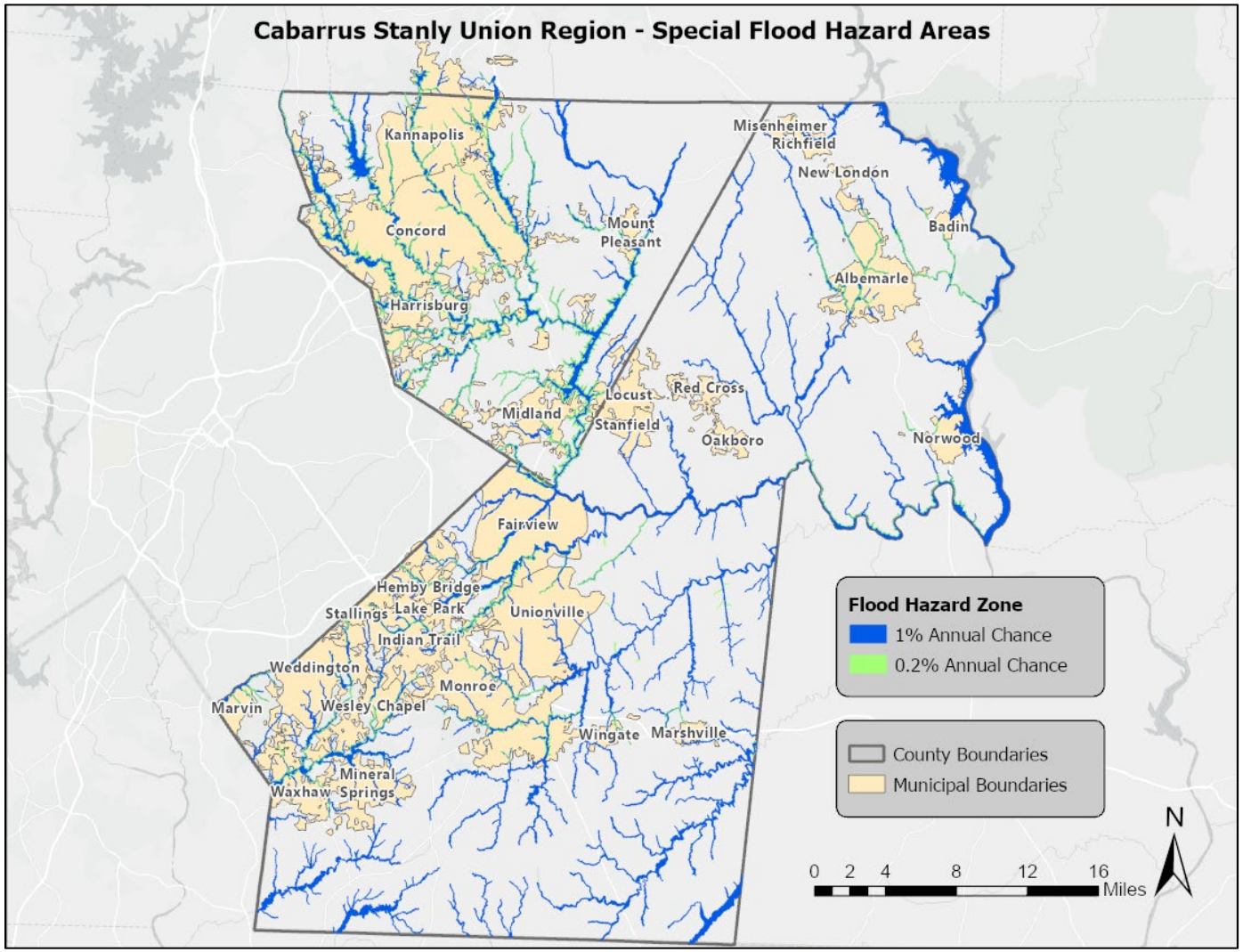


Structures in a Special Flood Hazard Area (SFHA) have a ≈**26% chance of flooding** during the span of a 30-year mortgage.

- **Flooding** is a top hazard in the nation for weather-related mortality and **the most common and costly natural hazard**
- The **2 main sources**:
  - Riverine flooding
  - Flash flooding
- NC climate projections suggest a likely increase in total annual precipitation and a very likely increase in extreme precipitation frequency/intensity
- **2024 FEMA NRI riverine flooding hazard ratings**:
  - Cabarrus – Relatively low
  - Stanly – Relatively low
  - Union – Relatively low

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Limited	Moderate	6 to 12 hours	Less than 1 week

Flooding



Source: Federal Emergency Management Agency, Map Service Center

Flooding – Historical Occurrences from NCEI (1993 – 2023)

Location	Number of Occurrences	Deaths / Injuries	Property Damage (2023)
Cabarrus County	**80**	**1/4**	**$18,708,423**
Concord	7	0/0	$70,093
Harrisburg	7	0/0	$87,918
Kannapolis	8	0/0	$1,754,791
Midland	1	0/0	$6,484
Mount Pleasant	3	0/0	$16,698
Unincorporated Area	54	1/4	$16,772,439
Stanly County	**86**	**5/0**	**$4,774,462**
Albemarle	31	0/0	$0
Badin	0	0/0	$0
Locust	2	0/0	$0
Misenhiemer	1	0/0	$0
New London	0	0/0	$0
Norwood	5	0/0	$4,410,919
Oakboro	5	0/0	$0
Red Cross	2	0/0	$0
Richfield	6	0/0	$35,127
Stanfield	4	0/0	$0
Unincorporated Area	30	5/0	$328,416
Union County	**77**	**3/0**	**$652,278**
Fairview	5	0/0	$20,053
Hemby Bridge	0	0/0	$0
Indian Trail	14	0/0	$99,107
Lake Park	0	0/0	$0
Marshville	1	0/0	$0
Marvin	1	0/0	$1,179
Mineral Springs	1	0/0	$28,002
Monroe	20	0/0	$15,223
Stallings	1	0/0	$0
Unionville	1	0/0	$0
Waxhaw	2	0/0	$168,264
Weddington	2	0/0	$35,819
Wesley Chapel	2	0/0	$30,832
Wingate	5	0/0	$6,266
Unincorporated Area	22	3/0	$247,533
Cabarrus Stanly Union Regional Total	**243**	**9/4**	**$24,135,163**

Flooding – NFIP Historical Losses and Repetitive Loss Properties (2024)

NFIP INSURED FLOOD LOSSES

Location	Flood Losses	Claims Payments
Cabarrus County	**207**	**$3,488,693.38**
Concord	29	$272,038.47
Harrisburg	64	$1,171,775.86
Kannapolis	0	$0
Midland	2	$8,397.28
Mount Pleasant	1	$39,671.97
Unincorporated Area	111	$1,996,809.80
Stanly County	**60**	**$2,724,247.53**
Albemarle	48	$2,625,883.15
Badin	1	$0
Locust	0	$0
Misenhiemer	0	$0
New London	0	$0
Norwood	3	$25,932.83
Oakboro	0	$0
Red Cross	0	$0
Richfield	0	$0
Stanfield	0	$0
Unincorporated Area	8	$72,431.55
Union County	**73**	**$1,296,391.18**
Fairview	3	$48,902.71
Hemby Bridge	1	$0
Indian Trail	16	$124,679.23
Lake Park	0	$0
Marshville	0	$0
Marvin	1	$0
Mineral Springs	0	$0
Monroe	7	$32,303.79
Stallings	3	$97,439.30
Unionville	7	$244,062.13
Waxhaw	0	$0
Weddington	1	$3,553.90
Wesley Chapel	5	$426,098.35
Wingate	0	$0
Unincorporated Area	29	$319,351.77
Cabarrus Stanly Union Regional Total	**340**	**$7,509,332.09**

NFIP REPETITIVE LOSS PROPERTIES

Location	Number of Properties	Number of Losses
Cabarrus County	**26**	**93**
Concord	3	8
Harrisburg	7	31
Kannapolis	3	7
Midland	0	0
Mount Pleasant	0	0
Unincorporated Area	13	47
Stanly County	**8**	**26**
Albemarle	7	23
Badin	0	0
Locust	0	0
Misenhiemer	0	0
New London	0	0
Norwood	0	0
Oakboro	0	0
Red Cross	0	0
Richfield	0	0
Stanfield	0	0
Unincorporated Area	1	3
Union County	**7**	**21**
Fairview	0	0
Hemby Bridge	0	0
Indian Trail	1	3
Lake Park	0	0
Marshville	0	0
Marvin	0	0
Mineral Springs	0	0
Monroe	1	2
Stallings	1	3
Unionville	1	3
Waxhaw	0	0
Weddington	0	0
Wesley Chapel	1	3
Wingate	0	0
Unincorporated Area	2	7
CABARRUS STANLY UNION REGION TOTAL	**41**	**140**

Source: Federal Emergency Management Agency, National Flood Insurance Program

Flooding – Building Loss Estimates from 100-year Flood (NCEM)

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**250**	**549**	**$4,625,432**	**31**	**$770,059**	**7**	**$236,583**	**587**	**$5,632,074**
Concord	49	168	$1,345,560	16	$353,063	3	$31,055	187	$1,729,678
Harrisburg	56	72	$1,376,833	4	$95,160	0	$0	76	$1,471,994
Kannapolis	109	132	$517,938	3	$279,170	2	$185,651	137	$982,758
Midland	6	10	$137,883	0	$0	0	$0	10	$137,883
Mount Pleasant	1	1	$672	0	$0	0	$0	1	$672
Unincorporated Area	29	166	$1,246,546	8	$42,666	2	$19,877	176	$1,309,089
Stanly County	**134**	**100**	**$1,605,826**	**47**	**$1,637,194**	**0**	**$0**	**147**	**$3,243,020**
Albemarle	96	53	$1,406,673	46	$1,610,391	0	$0	99	$3,017,064
Badin	0	0	$0	0	$0	0	$0	0	$0
Locust	0	1	$2,064	0	$0	0	$0	1	$2,064
Misenhiemer	2	2	$1,970	0	$0	0	$0	2	$1,970
New London	0	0	$0	0	$0	0	$0	0	$0
Norwood	12	12	$18,792	0	$0	0	$0	12	$18,792
Oakboro	1	1	$1,000	0	$0	0	$0	1	$1,000
Red Cross	0	0	$0	0	$0	0	$0	0	$0
Richfield	1	1	$406	0	$0	0	$0	1	$406
Stanfield	0	0	$0	0	$0	0	$0	0	$0
Unincorporated Area	22	30	$174,921	1	$26,803	0	$0	31	$201,724
Union County	**133**	**263**	**$709,172**	**55**	**$2,186,401**	**2**	**$9,129**	**320**	**$2,904,701**
Fairview	1	6	$41,002	1	$566	0	$0	7	$41,568
Hemby Bridge	10	9	$5,729	4	$29,117	0	$0	13	$34,846
Indian Trail	22	114	$205,387	18	$164,445	0	$0	132	$369,832
Lake Park	0	0	$0	0	$0	0	$0	0	$0
Marshville	6	9	$79,810	4	$1,316,472	0	$0	13	$1,396,282
Marvin	0	0	$0	0	$0	0	$0	0	$0
Mineral Springs	0	1	$882	0	$0	0	$0	1	$882
Monroe	33	21	$131,133	19	$487,711	0	$0	40	$618,844
Stallings	2	10	$21,696	0	$0	0	$0	10	$21,696
Unionville	3	9	$13,401	0	$0	0	$0	9	$13,401
Waxhaw	0	1	$129	0	$0	0	$0	1	$129
Weddington	1	4	$23,131	0	$0	0	$0	4	$23,131
Wesley Chapel	1	3	$18,470	0	$0	0	$0	3	$18,470
Wingate	5	13	$38,207	0	$0	0	$0	13	$38,207
Unincorporated Area	49	63	$130,195	9	$188,090	2	$9,129	74	$327,413
Cabarrus Stanly Union Regional Total	**517**	**912**	**$6,940,430**	**133**	**$4,593,654**	**9**	**$245,712**	**1054**	**$11,779,795**

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Minor	Small	Less than 6 hours	More than 1 week

Wildfire

CSU REGION WILDLAND URBAN INTERFACE (WUI)

Housing Density	WUI Population	Percent of WUI Population	WUI Acres	Percent of WUI Acres
LT 1hs/40ac	2,885	0.7 %	137,607	20.6 %
1hs/40ac to 1hs/20ac	7,345	1.7 %	105,107	15.8 %
1hs/20ac to 1hs/10ac	20,710	4.9 %	132,377	19.8 %
1hs/10ac to 1hs/5ac	38,080	9.0 %	116,481	17.5 %
1hs/5ac to 1hs/2ac	66,085	15.7 %	91,032	13.6 %
1hs/2ac to 3hs/1ac	254,735	60.4 %	81,711	12.2 %
GT 3hs/1ac	31,673	7.5 %	2,739	0.4 %
Total	**421,513**	**100.0 %**	**667,054**	**100.0 %**

Source: Southern Wildfire Risk Assessment

CSU REGION BURN PROBABILITY

Burn Probability	Acres	Percent
1 (Lowest Probability)	232,930	39.0 %
2	223,954	37.5 %
3	114,708	19.2 %
4	20,638	3.5 %
5	4,957	0.8 %
6	0	0.0 %
7	0	0.0 %
8	0	0.0 %
9	0	0.0 %
10 (Highest Probability)	0	0.0 %
Total	**597,187**	**100.0 %**

Source: Southern Wildfire Risk Assessment

- **Wildfire risk** depends on local weather conditions, potential fuel sources, outdoor activities, and the degree of public cooperation with fire prevention policies
  - Droughts and other natural hazards can exacerbate risks
- The entire region is at risk, especially near the **wildland-urban interface** (WUI)
  - **≈52%** of NC homes in WUI
- Each county in the region experiences an average of 40-80 wildfires per year
- Wildfire risks are growing in response to climate stressors, fuel loading, and WUI acreage
- **2024 FEMA NRI wildfire hazard ratings**:
  - Cabarrus – Very low
  - Stanly – Very low
  - Union – Very low

Probability	Impact	Spatial Extent	Warning Time	Duration
Likely	Minor	Small	Less than 6 hours	More than 1 week

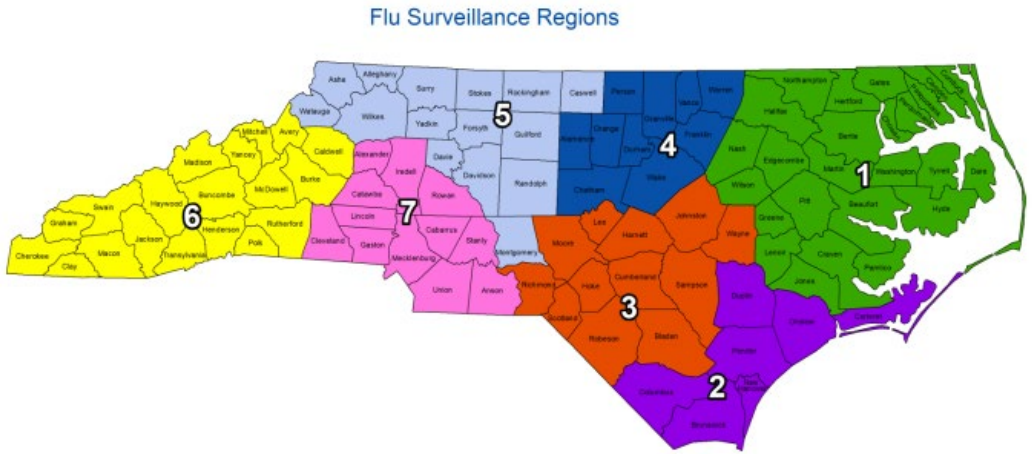
Wildfire

Wildfire – Building Loss Estimates from Wildfire Event (NCEM)

Location	Pre-Firm Buildings at Risk	Residential Buildings at Risk		Commercial Buildings at Risk		Public Buildings at Risk		Total Buildings at Risk	
		Number	Damages	Number	Damages	Number	Damages	Number	Damages
Cabarrus County	**2,518**	**6,215**	**$898,597,829**	**693**	**$924,950,155**	**140**	**$289,878,265**	**7,048**	**$2,113,426,250**
Concord	31	518	$76,855,980	57	$83,552,232	9	$44,881,589	584	$205,289,802
Harrisburg	451	520	$110,307,517	122	$125,888,986	21	$77,711,140	663	$313,907,643
Kannapolis	498	657	$90,327,032	53	$203,448,863	20	$43,186,961	730	$336,962,856
Midland	250	374	$42,194,682	32	$33,974,879	14	$24,313,375	420	$100,482,936
Mount Pleasant	225	240	$29,791,537	31	$32,288,753	7	$13,087,120	278	$75,167,410
Unincorporated Area	1,063	3,906	$549,121,081	398	$445,796,442	69	$86,698,080	4,373	$1,081,615,603
Stanly County	**8,702**	**10,839**	**$1,274,472,234**	**1181**	**$765,971,600**	**231**	**$286,453,591**	**12,251**	**$2,326,897,428**
Albemarle	192	194	$19,264,506	35	$36,150,591	18	$19,361,475	247	$74,776,573
Badin	26	18	$4,670,161	2	$1,804,104	4	$52,935,121	24	$59,409,387
Locust	330	315	$37,599,080	63	$42,680,210	11	$14,401,159	389	$94,680,449
Misenhiemer	6	9	$856,422	0	$0	0	$0	9	$856,422
New London	131	116	$11,422,579	19	$50,834,010	1	$933,660	136	$63,190,249
Norwood	294	274	$32,504,897	25	$39,576,501	12	$10,939,253	311	$83,020,651
Oakboro	465	501	$57,150,847	59	$49,621,475	5	$7,697,126	565	$114,469,448
Red Cross	148	207	$23,075,438	14	$4,360,974	9	$15,242,577	230	$42,678,990
Richfield	133	134	$36,512,497	14	$4,203,170	5	$2,495,809	153	$43,211,476
Stanfield	545	557	$66,659,044	68	$60,132,862	9	$4,313,895	634	$131,105,801
Unincorporated Area	6,432	8,514	$984,756,763	882	$476,607,703	157	$158,133,516	9,553	$1,619,497,982
Union County	**14,275**	**34,280**	**$5,608,017,289**	**2232**	**$2,104,337,629**	**583**	**$860,984,611**	**37,095**	**$8,573,339,525**
Fairview	590	825	$119,648,563	90	$99,012,681	23	$24,958,387	938	$243,619,630
Hemby Bridge	264	419	$38,592,247	46	$23,644,267	20	$7,586,379	485	$69,822,893
Indian Trail	1,049	6,544	$903,156,032	491	$366,304,463	71	$81,709,994	7,106	$1,351,170,489
Lake Park	3	227	$33,977,644	6	$10,296,830	0	$0	233	$44,274,474
Marshville	715	803	$95,893,273	59	$48,916,014	21	$46,726,435	883	$191,535,721
Marvin	44	471	$224,595,095	10	$6,881,206	4	$13,925,680	485	$245,401,981
Mineral Springs	251	402	$46,491,199	21	$6,037,573	18	$9,408,374	441	$61,937,146
Monroe	573	1,814	$225,772,357	128	$92,266,357	18	$13,168,962	1,960	$331,207,675
Stallings	897	2,317	$376,021,556	182	$125,856,205	14	$8,270,393	2,513	$510,148,154
Unionville	1,334	2,220	$358,230,869	165	$239,020,176	59	$82,979,294	2,444	$680,230,339
Waxhaw	207	282	$31,602,136	53	$26,258,144	11	$15,741,288	346	$73,601,568
Weddington	199	1,086	$300,827,038	56	$36,066,642	14	$12,797,855	1,156	$349,691,535
Wesley Chapel	220	1,415	$314,837,273	26	$27,618,190	17	$24,703,176	1,458	$367,158,639
Wingate	108	280	$38,240,704	15	$7,086,273	5	$10,249,184	300	$55,576,160
Unincorporated Area	7,821	15,175	$2,500,131,303	884	$989,072,608	288	$508,759,210	16,347	$3,997,963,121
Cabarrus Stanly Union Regional Total	**25,495**	**51,334**	**$7,781,087,352**	**4106**	**$3,795,259,384**	**954**	**$1,437,316,467**	**56,394**	**$13,013,663,203**

Probability	Impact	Spatial Extent	Warning Time	Duration
Unlikely	Limited	Moderate	More than 24 hours	More than 1 week

Infectious Disease

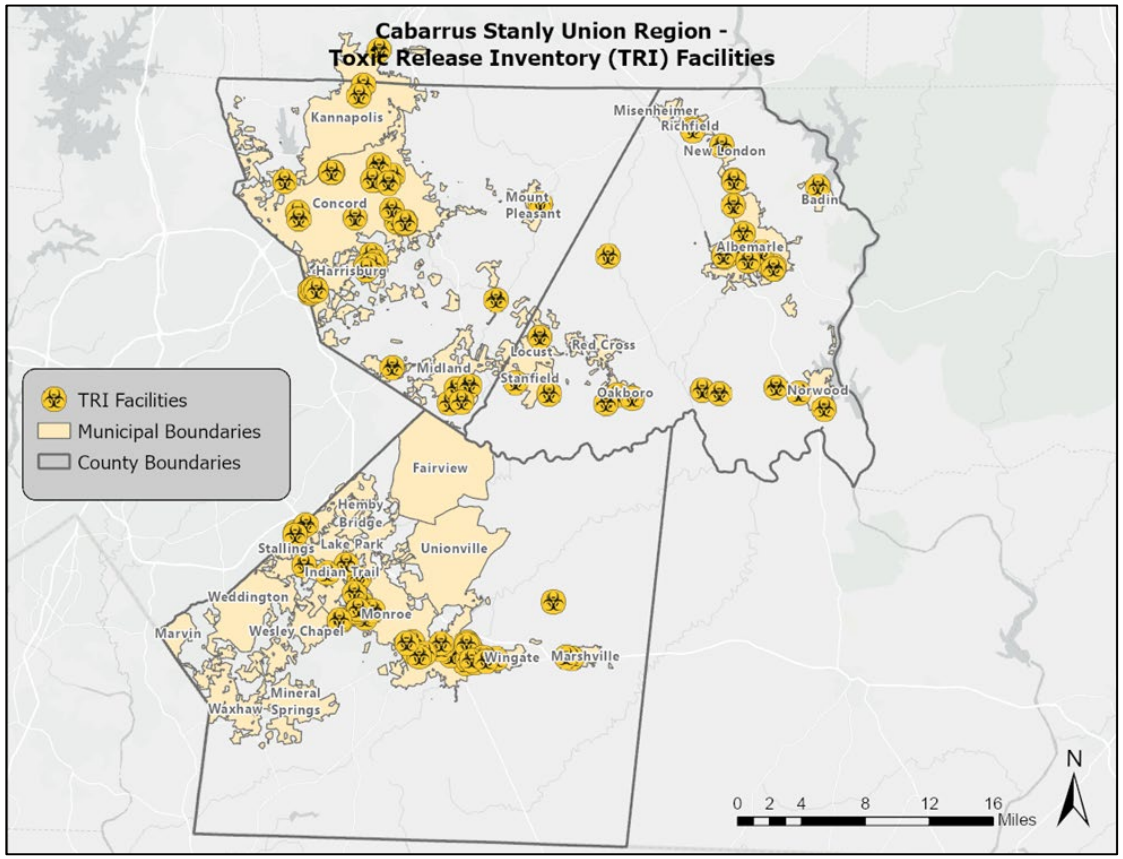


Source: NCDHHS Division of Public Health

- **Infectious disease** hazards include infectious diseases, vector-borne diseases, and foreign animal diseases (FAD) for consistency with the State HMP
- All counties in the region are in **Flu Surveillance Region 7**
- According to NCDHHS, the primary respiratory viruses treated during the 2022-2023 season included influenza and SARS-CoV-2 (COVID-19)
- Diseases of future concern include influenza, coronavirus, norovirus, antibiotic-resistant superbugs, and emerging FADs
- Per the CDC, milder winters, warmer summers, and fewer days of frost could cause more infectious diseases to spread

Probability	Impact	Spatial Extent	Warning Time	Duration
Possible	Limited	Small	Less than 6 hours	Less than 24 hours

Hazardous Substances

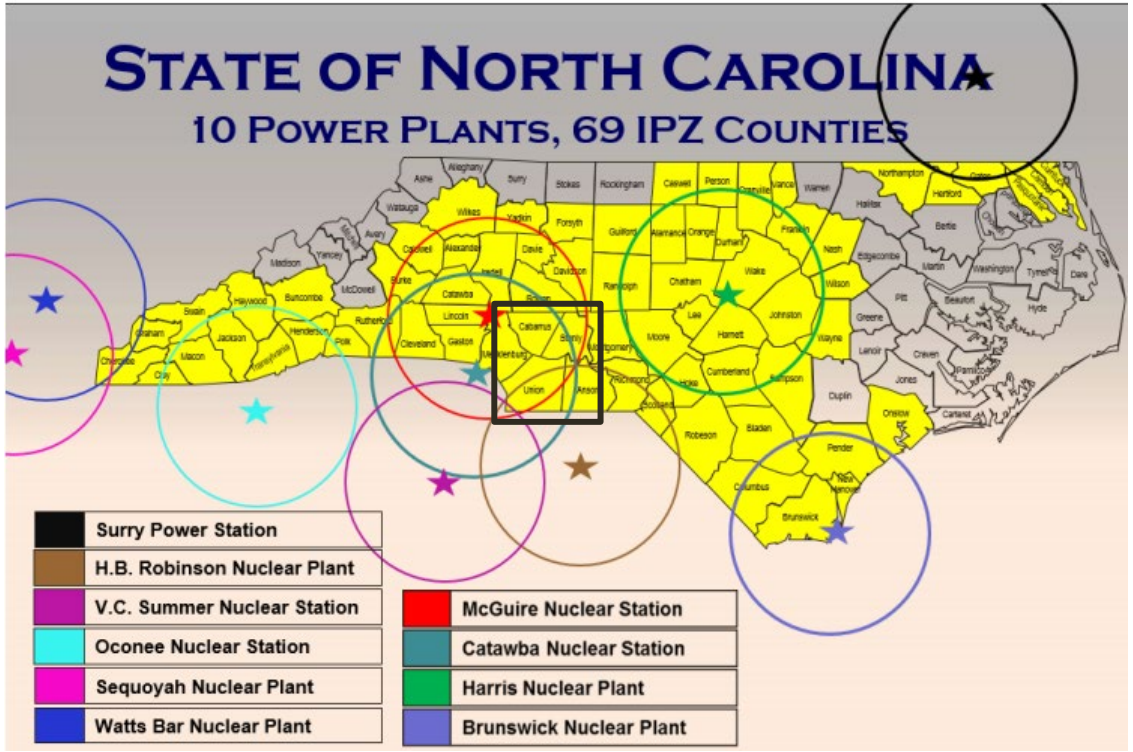


Source: Environmental Protection Agency

- **Hazardous substances** are found in many forms and quantities and pose a threat to people, property, and the environment if mishandled
- **≈6,774** hazardous materials (HAZMAT) incidents happen nationwide each year
  - **13 serious incidents** reported in the CSU Region through USDOT (PHMSA)
- Per 2023 EPA data, **112 toxic release inventory (TRI) facilities** in the region
- More growth = greater vulnerability of the population to this hazard, especially near transportation facilities
- Chemical releases by county (EPA, 2022)
  - Cabarrus – 97.3k lbs. to air and 794 lbs. to water
  - Stanly – 49 lbs. to air and 180 lbs. to water
  - Union – 35.9k lbs. to air and 34 lbs. to water

Probability	Impact	Spatial Extent	Warning Time	Duration
Unlikely	Critical	Moderate	6 to 12 hours	Less than 1 week

Radiological Emergency



Source: NCEM

- The IAEA defines a **nuclear accident** as "an event that has led to significant consequences to people, the environment, or the facility"
- While radiological emergencies are rare, many incidents are recognized by their large area of impact and chronic biological effects
- **McGuire** and **Catawba Nuclear Stations** are both within 10 miles of the CSU Region and 50-mile buffer zones intersect all counties
- Although this hazard is very unlikely, potential damage to nuclear facilities necessitates close monitoring

Probability	Impact	Spatial Extent	Warning Time	Duration
Possible	Critical	Small	Less than 6 hours	Less than 24 hours

Terrorism

Location	2022 Population Estimate	2020 Population Density (sq. mi.)
Cabarrus County	226,396	625.1
Concord	105,335	1,657.9
Harrisburg	18,934	1,681.9
Kannapolis	53,314	1,623.6
Midland	4,675	352.1
Mount Pleasant	1,776	465.1
Unincorporated Area	42,362	--
Stanly County	62,723	158.2
Albemarle	16,444	941.1
Badin	2,075	1,116.4
Locust	4,700	559.5
Misenhiemer	652	401.2
New London	674	307.3
Norwood	2,906	521.6
Oakboro	2,379	847.8
Red Cross	677	204.2
Richfield	921	240.3
Stanfield	1,463	354.6
Unincorporated Area	29,832	--
Union County	240,109	376.6
Fairview	3,512	115.3
Hemby Bridge	1,924	704.5
Indian Trail	40,325	1,798.7
Lake Park	3,342	4,447.6
Marshville	2,565	1,188.5
Marvin	6,421	1,062.1
Mineral Springs	3,185	384.8
Monroe	34,897	1,129.1
Stallings	16,193	1,928.4
Unionville	6,694	227.4
Waxhaw	20,665	1,696.6
Weddington	13,173	752.0
Wesley Chapel	8,763	897.9
Wingate	4,061	1,816.8
Unincorporated Area	74,389	--
Cabarrus Stanly Union Regional Total	**529,228**	**224.6**

- The main categories of weapons used in terror attacks excluding small arms and vehicles are **Chemical, Biological, Radiological, Nuclear, and Explosive** (CBRNE)
  - Explosives pose the most risk vs. others
- Terror threats are more likely to target (1) **areas with a high population density**, (2) **critical infrastructure**, or (3) **symbolic locations**
- No major terror attacks have been reported
- As the population of the region continues to increase, the risk of an attack can increase as well

Probability	Impact	Spatial Extent	Warning Time	Duration
Possible	Limited	Moderate	Less than 6 hours	Less than 1 week

Cyber

- **Cyberattacks** are deliberate attacks on information technology systems to gain illegal access to a computer, steal information, or purposely cause damage
  - Can impact: PII records, municipal services, utilities, hospitals/EMS
  - Many types: data breaches, phishing, malware, ransomware, DDoS attacks
- Mitigating and preparing for this hazard remains challenging because of how diverse and complex cyberattacks can be
  - **Lead federal agency** – FBI
  - **Lead state agency** – North Carolina Department of Information Technology
- Cyberattacks can happen in both the public and private sectors, with **83% of breaches involving external actors** and most of them being financially motivated (2023 Verizon Data Breach Investigations Report)
- Highest # of cybercrimes in NC are personal data breaches (FBI IC3, 2023)
- Ongoing preparedness and training efforts for future threats in the region are crucial

Probability	Impact	Spatial Extent	Warning Time	Duration
Unlikely	Critical	Moderate	12 to 24 hours	Less than 1 week

Electromagnetic Pulse

- The U.S. Department of Energy defines **electromagnetic pulses** (EMPs) as "intense pulses of electromagnetic energy resulting from solar-caused effects or man-made nuclear and pulse power devices"
- Congress amended the Homeland Security Act of 2002 by passing the **Critical Infrastructure Protection Act** (CIPA) in 2015 which integrated more protections and awareness related to EMP threats
- Bigger cities with higher population densities and concentrated electrical infrastructure in the region may be more susceptible to critical damages
- This hazard is highly unlikely as natural EMP events typically have limited lasting effects and man-made EMPs require highly specialized equipment and extensive resources

Probability	Impact	Spatial Extent	Warning Time	Duration
Unlikely	Minor	Small	Less than 6 hours	Less than 24 hours

Civil Disturbance

- **Civil disturbances** often refer to incidents in which multiple people knowingly act against established laws or regulations, with a common goal of bringing attention to a specific cause or larger sociopolitical movement
- The extent of any civil disturbance will depend on the scale of its location and crowd size
- If a public disturbance or riot occurs, local law enforcement agencies are mobilized followed by state law enforcement
  - National Guard may be activated as determined by the NC Governor
- **Can materialize under different circumstances:**
  - Spontaneous actions or a direct result of escalating tensions
  - Most likely when large numbers of people are clustered together for an event or interest-based gathering
  - Arenas and stadiums with large capacities are areas of concern
- Civil disturbances are anticipated to occur at some point in the future as they are highly unpredictable features of social life

Probability	Impact	Spatial Extent	Warning Time	Duration
Possible	Minor	Moderate	More than 24 hours	Less than 1 week

Food Emergency

- Per FEMA, a **food emergency** refers to the "adulteration and/or contamination, threatened or actual, of food that impacts or may impact human health or the safety or availability of the state's food supply"
- A food emergency may be caused by inclement weather events, technological storage failures, or human activities
- This hazard could have **severe consequences across the larger industry** including anywhere affected by regional food markets and may jeopardize the public health of any locally affected populations
  - Nearly 300 people became ill after a barbeque in Cabarrus County in November 2018
- Changing climate patterns of drought, heat, and precipitation may increase the risk of food emergencies as they affect crop yields and the spread of pathogens
- Unpredictable hazard with limited historical data

Priority Risk Index (PRI) Methodology

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	30%
	Possible	Between 1% and 10% annual probability	2	
	Likely	Between 10 and 100% annual probability	3	
	Highly Likely	100% annual probability	4	
Impact	Minor	Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	1	30%
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day.	2	
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Less than 1% of area affected	1	20%
	Small	Between 1 and 10% of area affected	2	
	Moderate	Between 10 and 50% of area affected	3	
	Large	Between 50 and 100% of area affected	4	
Warning Time	More than 24 hours	Self-explanatory	1	10%
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
Duration	Less than 6 hours	Self-explanatory	1	10%
	Less than 24 hours	Self-explanatory	2	
	Less than one week	Self-explanatory	3	
	More than one week	Self-explanatory	4	

Tabulated PRI Results

Hazard	Subhazard(s) Assessed	Category/Degree of Risk					
		Probability	Impact	Spatial Extent	Warning Time	Duration	PRI Score
Natural Hazards							
Drought	Agricultural, Hydrological	Likely	Minor	Large	More than 24 hours	More than 1 week	2.5
Excessive Heat		Likely	Critical	Large	More than 24 hours	Less than 1 week	3.0
Hurricane and Coastal Hazards	Storm Surge, Severe Weather	Possible	Critical	Large	More than 24 hours	Less than 1 week	2.7
Tornadoes/ Thunderstorms	High Wind, Hail, Lightning	Highly Likely	Limited	Moderate	6 to 12 hours	Less than 6 hours	2.8
Severe Winter Weather	Snow, Blizzards, Wind Chill, Extreme Cold, Freezing Rain	Likely	Critical	Large	More than 24 hours	Less than 1 week	3.0
Earthquakes		Possible	Limited	Moderate	Less than 6 hours	Less than 6 hours	2.3
Geological	Landslide, Sinkholes, Erosion	Possible	Limited	Small	Less than 6 hours	Less than 6 hours	2.1
Dam Failure		Unlikely	Critical	Moderate	Less than 6 hours	Less than 1 week	2.5
Flooding		Likely	Limited	Moderate	6 to 12 hours	Less than 1 week	2.7
Wildfires		Likely	Minor	Small	Less than 6 hours	More than 1 week	2.4
Infectious Disease	Foreign Animal Disease	Unlikely	Limited	Moderate	More than 24 hours	More than 1 week	2.0
Technological Hazards							
Hazardous Substances		Possible	Limited	Small	Less than 6 hours	Less than 24 hours	2.2
Radiological Emergency	Fixed Nuclear Facilities	Unlikely	Critical	Moderate	6 to 12 hours	Less than 1 week	2.4
Terrorism	Explosive, Chemical, Radiological, Biological, Nuclear	Possible	Critical	Small	Less than 6 hours	Less than 24 hours	2.5
Cyber		Possible	Limited	Moderate	Less than 6 hours	Less than 1 week	2.5
Electromagnetic Pulse		Unlikely	Critical	Moderate	12 to 24 hours	Less than 1 week	2.3
Civil Disturbance		Unlikely	Minor	Small	Less than 6 hours	Less than 24 hours	1.6
Food Emergency		Possible	Minor	Moderate	More than 24 hours	Less than 1 week	1.9

Categorized PRI Results

*__Note__: low-risk hazards are not prioritized for mitigation

HIGH RISK	Excessive Heat Hurricanes and Coastal Hazards Tornadoes/Thunderstorms Severe Winter Weather Flooding
MODERATE RISK	Drought Dam Failure Wildfire Infectious Disease Hazardous Substances Radiological Emergency Terrorism Cyber
LOW RISK	Geological Earthquakes Electromagnetic Pulse Civil Disturbance Food Emergency

Questions

Questions/Comments/Concerns

Mitigation Strategy

Mitigation Strategy Meeting Objectives

Capability Assessment
➢ Overview of Capability Assessment
➢ Summary of Initial Findings
➢ Identify Changes Since Last Update
➢ Discuss New Requirement on SDEs
➢ Influence/Role on Mitigation Actions

Mitigation Strategy Development
➢ Overview of Mitigation
➢ Consider Mitigation Techniques Available
➢ Review Previous Mitigation Goals
➢ Discuss Existing Actions and Update Status
➢ Identify New Actions and Opportunities

Organize Resources

Plan Update Process

Step 1: Organize Resources

Planning

Planning for Public Involvement

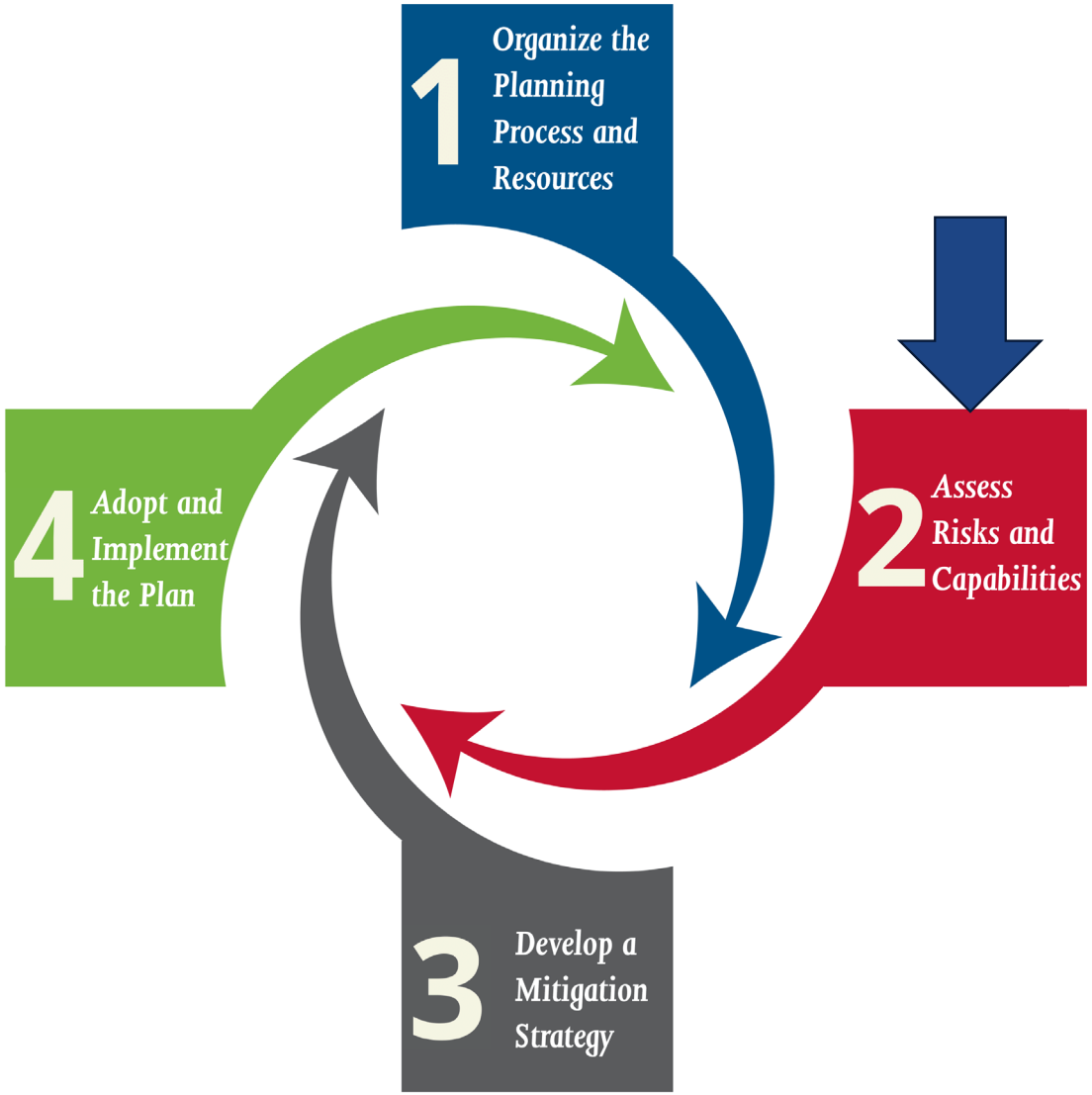
Status: Ongoing

Coordinating

Coordinating with Departments and Agencies

Status: Ongoing

Risk & Capability Assessment



Plan Update Process

Step 2: Risk and Capability Assessments

Hazard Identification

What Can Happen Here?

- Previously Identified Hazards
- Identify New Hazards
- **Status**: Completed

Vulnerability Assessment

What Will be Affected/Impacted?

- Will Use County Parcel Data, FEMA HAZUS Analysis, and NCEM Data
- **Status**: Ongoing

Capability Assessment

What is our capacity to mitigate?

- Communities previously Self-Assessed Capability
- What Mitigation Actions are Feasible
- Where Gaps Exist
- **Status**: Current

What is Capability?

- Measures community capability to implement hazard mitigation activities
- Identifies and target gaps, conflicts and opportunities with existing local plans, programs, policies, etc.
- Identifies mitigation measures already in place or underway
- *Coupled with the Risk Assessment, the Capability Assessment helps to form the foundation for identifying Mitigation Actions*

Capability Indicators

Indicators help evaluate a community's resources, capability, and readiness to effectively implement and maintain mitigation activities.

Plans and Regulatory – Plans, programs, & ordinances

Administrative and Technical – Relevant staff, personnel, and expertise

Fiscal Resources – Bonds, fees, and taxes

Education and Resources – Education programs, volunteer groups, and certifications

Mitigation Resources – Mitigation grants and activities

Political Will – Decision-making, investments, regulation enforcement

Capability Indicator Examples

Plans and Regulatory
Hazard Mitigation Plan
Comprehensive Land Use Plan
Stormwater Management Plan
Flood Prevention Ordinance
National Flood Insurance Program
Community Rating System

Fiscal Resources
Capital Improvement Program
CDBG Funding
Special Purpose Taxes
Gas/Electric Utility Fees
Stormwater Utility Fees
Special Tax Bonds

Administrative and Technical
Building Official
Emergency Manager
Floodplain Manager
Grant Writers
Land Surveyors
GIS-Skilled Personnel

Education and Outreach
Local Citizen Groups
School Programs
Ongoing Education Programs
Storm Ready Certification
Firewise Community Certification
Public-Private Partnerships

Cabarrus County Capability Assessment Initial Findings

Jurisdiction	Overall Capability Rating
Cabarrus County	**High**
Concord	High
Harrisburg	Moderate
Kannapolis	High
Midland	Moderate
Mount Pleasant	Moderate

Capability Rating Summary
High Capability – 3 jurisdictions
Moderate Capability – 3 jurisdictions
Low Capability – 0 jurisdictions

	Low Vulnerability	Moderate Vulnerability	High Vulnerability
High Capability	(Best Case Scenario)		
Moderate Capability			
Low Capability			(Worst Case Scenario)

Stanly County Capability Assessment Initial Findings

Jurisdiction	Overall Capability Rating
Stanly County	**High**
Albemarle	Moderate
Badin	Moderate
Locust	High
Misenheimer	Moderate
New London	Moderate
Norwood	Moderate
Oakboro	High
Red Cross	Moderate
Richfield	Moderate
Stanfield	Moderate

Capability Rating Summary

High Capability – 3 jurisdictions

Moderate Capability – 8 jurisdictions

Low Capability – 0 jurisdictions

	Low Vulnerability	Moderate Vulnerability	High Vulnerability
High Capability	(Best Case Scenario)		
Moderate Capability			
Low Capability			(Worst Case Scenario)

Union County Capability Assessment Initial Findings

Jurisdiction	Overall Capability Rating
Union County	**High**
Fairview	High
Hemby Bridge	Moderate
Indian Trail	High
Lake Park	Moderate
Marshville	High
Marvin	High
Mineral Springs	High
Monroe	High
Stallings	High
Unionville	Moderate
Waxhaw	High
Weddington	High
Wesley Chapel	High
Wingate	Moderate

Capability Rating Summary

High Capability – 11 jurisdictions

Moderate Capability – 4 jurisdictions

Low Capability – 0 jurisdictions

	Low Vulnerability	Moderate Vulnerability	High Vulnerability
High Capability	(Best Case Scenario)		
Moderate Capability			
Low Capability			(Worst Case Scenario)

New FEMA Requirement on Substantial Damage Estimates (SDEs) for Capability Assessments

Rationale:

1. Focuses on identifying structures at risk of substantial damage from future flood events
2. Helps prioritize mitigation strategies and allocate resources effectively
3. Ensures a proactive approach to reduce vulnerability and enhance community resilience to floods
4. Emphasizes the importance of incorporating SDE findings into hazard mitigation planning for risk reduction

Follow-up Action Required: Must collect this information from each municipality individually (example below):

Immediately after a flood event, employees across multiple departments that consist of Town planners, stormwater and transportation engineers, inspectors, building officials, and certified floodplain managers deploy to the affected areas. The town is broken into three areas and each area has a dedicated number of teams to conduct windshield surveys and assess damage.

This is tracked digitally and on paper forms and then logged into Town databases. Once homeowners come in for permits for repair work, this data is referenced and if a substantial damage is triggered then the building must come into compliance with all Town ordinances, including the floodplain ordinance.

If a homeowner or applicant comes in to improve the property voluntarily without damage, then substantial improvement protocols are activated. This entails a lengthy review during plan review of the project scope, evaluating the building's depreciated value either by tax assessor value or through an appraisal, and the work is adjusted accordingly depending on the determination. All work is also field verified by inspectors to make sure construction is up to code and in compliance with Town ordinances.

Impact on Mitigation Actions

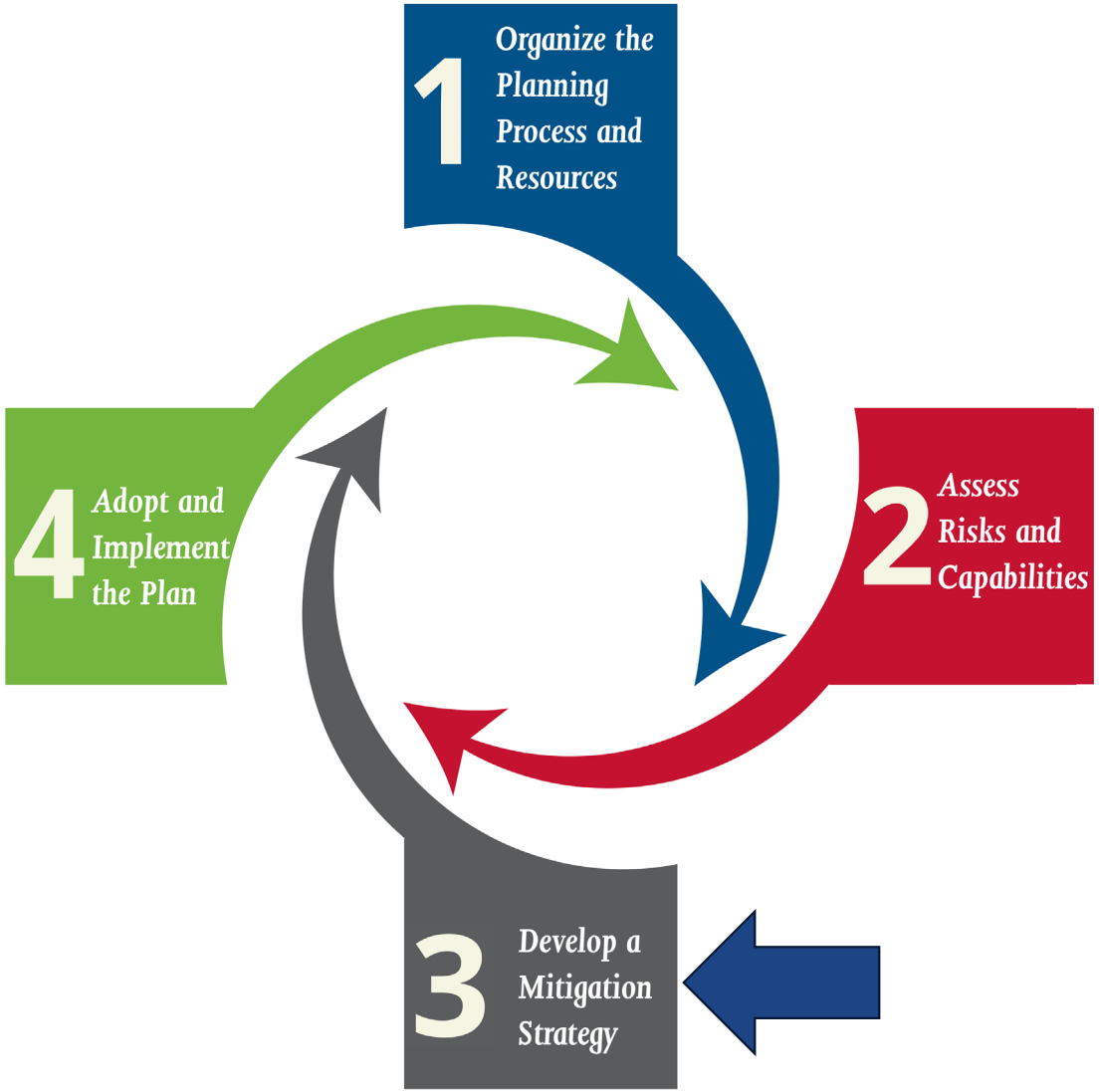
***Note**: Hazard scores may be adjusted in later versions of the draft plan based on new feedback.

HIGH RISK	Excessive Heat Hurricanes and Coastal Hazards Tornadoes/Thunderstorms Severe Winter Weather Flooding
MODERATE RISK	Drought Dam Failure Wildfire Infectious Disease Hazardous Substances Radiological Emergency Terrorism Cyber
LOW RISK	Geological Earthquakes Electromagnetic Pulse Civil Disturbance Food Emergency

Analysis of risks alongside capabilities is essential for informed decision-making and mitigation strategy development because the combined data:

1. Provides a complete picture of the risks faced by the community and its readiness to manage them
2. Helps identify gaps in preparedness and allocates resources strategically to address vulnerabilities
3. Ensures investments in mitigation measures are targeted at areas and/or populations at highest risk (supports prioritization of actions)

Mitigation Strategy Development



Plan Update Process

Step 3: Mitigation Strategy Development

- Setting Mitigation Goals
- Reviewing Mitigation Alternatives
- Drafting an Action Plan

****Status of All Tasks**: Current

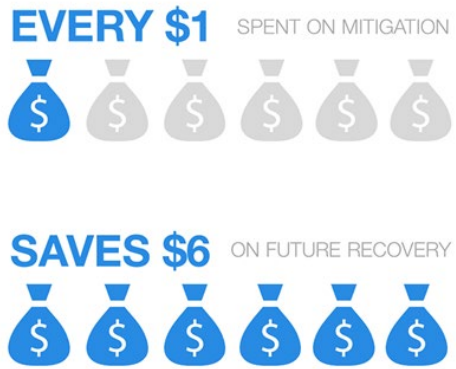
What is a Mitigation Strategy?

What is the purpose?

- Reduce vulnerability and mitigate the impact of natural and man-made hazards on communities
- Prioritize actions and allocate resources effectively
- Collaborate with stakeholders, heighten awareness, and build capacity for continued hazard mitigation efforts

What does it entail?

- Development, prioritization, and implementation of feasible measures to prevent, prepare for, respond to, and recover from potential disasters



Basic Types of Mitigation

Mitigating against hazard impacts on **existing development**

- Houses
- Businesses
- Infrastructure
- Critical Facilities

Ensuring **future development** is conducted in a way that does not increase vulnerability

- Plans
- Policies
- Procedures

Mitigation Techniques

1. Prevention
2. Property Protection
3. Natural Resource Management
4. Structural Projects
5. Emergency Services
6. Education and Awareness

Mitigation Techniques – Examples

Prevention
Planning/Zoning
Building Codes
Open Space Preservation
Floodplain Regulations
Stormwater Mgmt.
Drainage Maintenance

Natural Resource Mgmt.
Floodplain Protection
Watershed Mgmt.
Riparian Buffers
Erosion/Sediment Control
Wetland Restoration
Habitat Preservation

Emergency Services
Warning Systems
Response Equipment
Shelter Operations
Evacuation Planning
Response Training
Sandbagging

Property Protection
Acquisition/Relocation
Building Elevation
Critical Facility Protection
Retrofitting
Safe Room/Shutters
Insurance

Structural Projects
Reservoirs
Dams, Levees, Dikes
Stormwater Diversions
Retention Basins
Channel Modification
Storm Sewers

Education/Awareness
Outreach Projects
Speaker Series
Hazard Map Info
Real Estate Disclosure
Library Materials
Hazard Expositions

Setting Mitigation Goals

44 CFR Requirement

44 CFR Part 201.6(c)(3)(i): The mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Goal #1	Decrease the community's vulnerability to impacts from future hazard events.
Goal #2	Increase the community's resiliency and internal capabilities so that response and recovery can be quicker and more cost-effective.
Goal #3	Enhance existing county ordinances, regulations, and policies that will reduce the potential damage from hazards.
Goal #4	Protect public health, safety, and welfare.

Review Mitigation Alternatives

44 CFR Requirement

44 CFR Part 201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effect of each hazard, with particular emphasis on new and existing buildings and infrastructure.

1. Review previous plan to determine the status of existing actions
   - FEMA Requirement
   - Completed, deleted, progress update
   - "Ongoing" is too broad
2. Identify new mitigation actions to address evolving needs/vulnerabilities
   - To be discussed in length at today's meeting

Cabarrus County Mitigation Action Plan

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	Review plan for debris removal and disposal.	Winter Storm	High	Emergency Management, County General Services	Local, EMPG	2025, Annually	Deferred. The plan was updated in February 2018 and will continue to be reviewed on an annual basis.
P-2	Review inclement weather plan for county transportation system.	Winter Storm	High	Emergency Management, Transportation	Local	2025, Annually	Deferred. The plan is reviewed annually and after each major incident and will continue to be reviewed on an annual basis.
P-3	Maintain Flood Damage Prevention Ordinance that is in compliance with state and federal regulations for floodplain management and best practices.	Severe Thunderstorm, Hurricane and Tropical Storm, Flood	High	Planning and Development, Board of Commissioners, Construction Standards	Local	2025	Adopted new maps and updated state model ordinance on October 15, 2018.
P-4	Maintain freeboard of minimum 2' above BFE which exceeds model ordinance requirement of 1'.	Severe Thunderstorm, Hurricane and Tropical Storm, Flood	High	Planning and Development, Board of Commissioners, Construction Standards	Local	The ordinance will remain as it is until changes occur at state or federal level and/or county is advised to change.	Deferred. Current Flood Damage Prevention Ordinance is in compliance and will remain until changes occur at state or federal level. Requirement for 2' freeboard exceeds minimum 1' requirement established in model ordinance. Updated Fall 2018.
P-5	Adopt revised floodplain maps in a timely manner when received from FEMA.	Severe Thunderstorm, Hurricane and Tropical Storm, Flood	High	FEMA, NCEM, Planning and Development, Board of Commissioners	Local	When new maps are provided.	Deferred. Updated maps were provided by FEMA in November of 2018. Revised maps will be adopted and FDPO language revised to reflect new dates as needed.

Review Previous Mitigation Action Plans (2020)

Action	Description	Hazard(s) Addressed	Priority	Lead Agency	Potential Funding Sources	Implementation Schedule	Implementation Status
P-3	Maintain Flood Damage Prevention Ordinance that is in compliance with state and federal regulations for floodplain management and best practices.	Severe Thunderstorm, Hurricane and Tropical Storm, Flood	High	Planning and Development, Board of Commissioners, Construction Standards	Local	2025	Adopted new maps and updated state model ordinance on October 15, 2018.

What goals/objectives does this action address?

What hazards does this action address?

What is the estimated cost of this action?

How long will it take to implement?

Developing a Mitigation Action Plan

Identify New Mitigation Actions

- Brainstorm and discuss a full range of possible mitigation projects/available mitigation techniques
  - Consistent with mitigation goals and other community objectives
  - Based on hazard risk and local capability
  - Consider BRIC projects for inclusion
- Use available resources to aid in strategy development
  - FEMA's Local Mitigation Planning Handbook
  - FEMA's Mitigation Ideas
  - FEMA's Economic Development Strategy and Hazard Mitigation Plan Alignment

Mitigation Strategy – Examples

Potential Actions to Mitigate Extreme Heat (high-risk events):

1. Increase Green Space, Parks, and Urban Forests
2. Develop and Implement Heat Emergency Response Plans/Protocols
3. Install Public Cooling Stations, Misting Stations, and Water Fountains in Public Spaces
4. Conduct Outreach Campaigns to Raise Awareness About Heat-Related Risks

Mitigation Strategy – Examples

Potential Actions to Mitigate Severe Storms (high-risk events):

1. Strengthen Building Codes
2. Protect Power Lines/Traffic Signs
3. Retrofit Buildings/Facilities to Withstand High Winds
4. Require/Designate Safe Rooms in Certain Types of Buildings

Mitigation Strategy – Examples

Potential Actions to Mitigate Flooding (high-risk events; the most common and destructive hazard nationwide)

1. Remove Existing Structures from Flood Hazard Zones
2. Increase the Capacity of Storm Drainage Systems
3. Protect and Preserve Wetlands
4. Develop an Open Space Acquisition, Reuse, and Preservation Plan

Project Schedule

Project Kickoff Date – 3/13/24

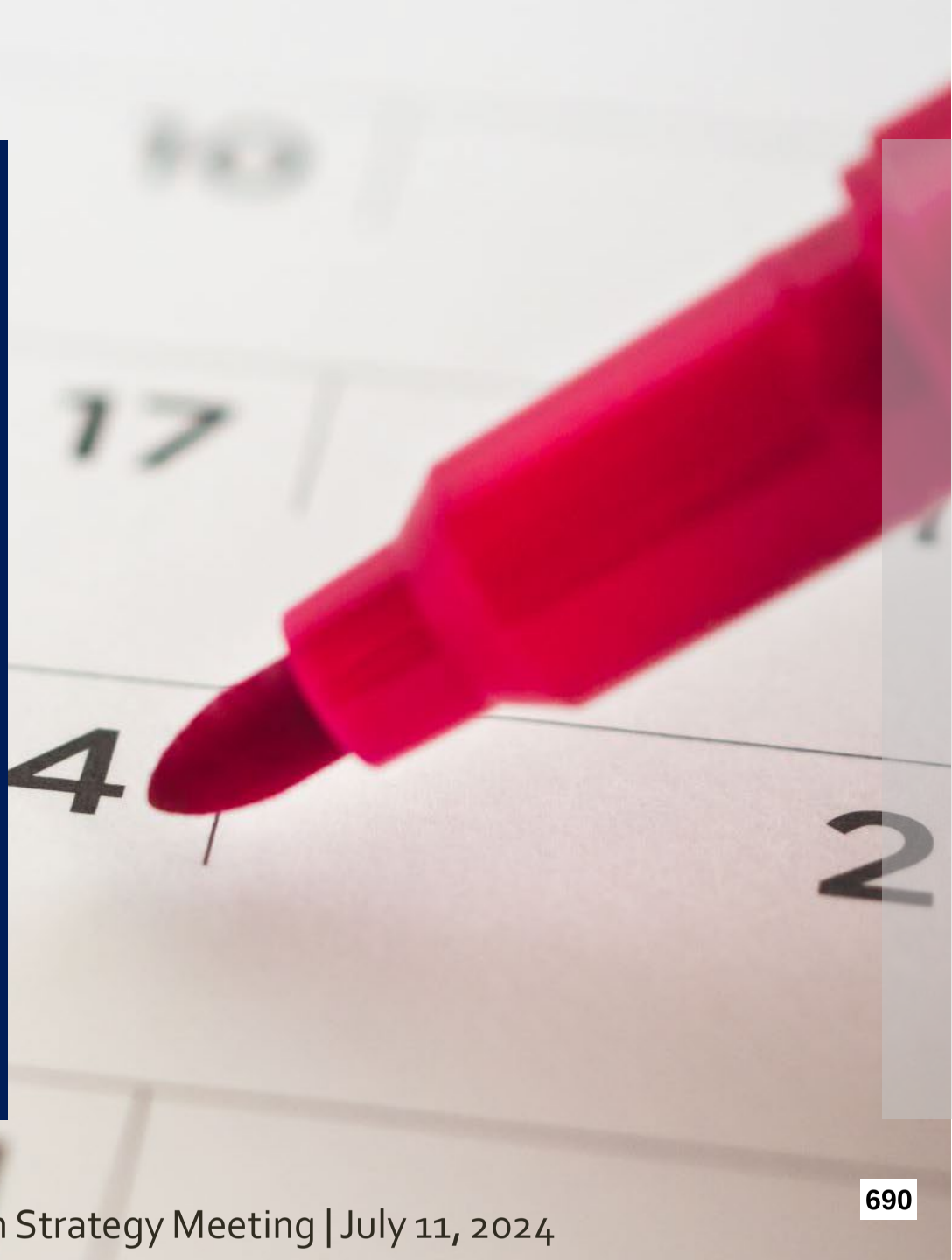
Public Meeting #1 – Date TBD

HIRA/Mitigation Strategy Meeting – *Today*

Proposed Delivery of Draft – 12/16/24

Public Meeting #2 – Date TBD

Existing Plan Expiration Date – 6/16/25



Next Steps

1. Submit Updated Mitigation Actions
2. Submit New Mitigation Actions (if any)
3. Review Draft Capability Assessment – Provide Input
4. Submit Substantial Damage Estimate (SDE) Procedures
5. Draft Plan Submitted in mid-December

Following Draft Plan Approval:

Adopt & Implement the Plan

Plan Update Process

Step 4: Adoption and Implementation

- Seeking Review and Approval from Relevant Authorities
- Securing Funding and Managing Resources of Mitigation Projects and Activities
- Executing the Identified Mitigation Actions
- Continuously Monitoring the Progress of Mitigation Activities

Questions

Questions/Comments/Concerns

Adjourn –
Thank you!

Contact Information

Nathan Slaughter –
nslaughter@espassociates.com

John Flores –
jflores@espassociates.com

Hannah DeLude –
hdelude@espassociates.com

Public Meeting
February 11th, 2024
6:00pm – 7:00pm
Teams Meeting

I. Meeting Objectives

a. ENGAGE THE COMMUNITY
b. GATHER INPUT
c. EDUCATE AND INFORM
d. ENHANCE PLAN RELEVANCE

II. Mitigation Overview

a. MITIGATION DEFINITIONS
b. TYPES OF MITIGATION
c. MITIGATION TECHNIQUES

III. Purpose of Update

a. REFLECT ON CHANGING RISKS
b. INCREASE COMMUNITY RESILIENCE
c. ENSURE COMPLIANCE AND FUNDING
d. INCREASE PREPAREDNESS

IV. Project Overview

a. FOUR-PHASE PLANNING PROCESS
b. PROJECT SCHEDULE
c. PLAN STRUCTURE
d. PLAN SECTIONS

V. Findings

a. PRIORITY RISK INDEX (PRI) SCORES
b. PUBLIC SURVEY FINDINGS

VI. Next Steps

a. IMPLEMENT REVISIONS FROM FEEDBACK
b. SUBMIT TO NCEM & FEMA
c. LOCAL ADOPTION OF PLAN

Public Meeting
February 11th, 2025
6:00pm – 7:00pm
Teams Meeting

In February of 2025, the public meeting for the Cabarrus, Stanly, Union County Regional Hazard Mitigation Plan Update was held to educate and inform the public on the development of the draft plan as well as next steps. In addition to raising public awareness, the aim of this meeting was to offer the public an opportunity to ask questions and provide feedback/input to enhance plan relevance. At the time of this meeting, the plan was still in draft form meaning revisions could be made prior to submittal to FEMA.

The CSU Regional Hazard Mitigation Plan has been around for nearly 15 years. The meeting aimed to define hazard mitigation and explore its various types, focusing on existing developments' vulnerability and ensuring future developments minimize risks. Mitigation was explained *as steps or actions taken to reduce the impact of the next event*. Key mitigation techniques discussed included prevention strategies, property protection measures, natural resource management, structural projects, and emergency services enhancements. The update reflects changing risks due to increased development and a shift toward an "all hazards" approach, while also incorporating climate change considerations.

The project overview highlighted the requirements of the Disaster Mitigation Act of 2000 (DMA 2000), emphasizing that hazard mitigation planning is essential for maintaining eligibility for federal funding programs, such as Flood Mitigation Assistance (FMA), Building Resilient Infrastructure and Communities (BRIC), and the Hazard Mitigation Grant Program (HMGP). FEMA requires hazard mitigation plans to be updated every 5 years to remain eligible for funding. Following Hurricane Helene, the State of North Carolina is looking to receive $1.5 billion in federal funding.

The planning process was reviewed, which outlined a four-step update process:

1. Organizing resources – The planning team has been working with participating counties and municipalities within this regio and has conducted public outreach/stakeholder engagement to engage diverse perspectives.
2. Conducting a risk assessment – This began with hazard identification (*What can happen here*?) considering historical occurrence and emerging hazards. After hazards have been identified, the planning team examines hazard impact (*What do these hazards do when they occur within the region*?), while considering capability to act.
3. Developing a mitigation plan – Existing actions from the previous update are reviewed and involve project implementation status updates (as required by FEMA). In addition to project status updates, new mitigation actions were discussed during the Mitigation Strategy Meeting with the Planning Committee and integrated into the mitigation plan.
4. Final adoption and implementation – The next step following this meeting is to adopt the plan and begin action implementation. The draft plan has been sent to the Planning Committee and has gone through the first round of review through NCEM. FEMA will provide

the final review and approval of the plan, but communities can adopt the plan at this time to expedite the process.

The structure of the plan was also reviewed during this meeting to facilitate clarity and understanding, sharing the breakdown of all ten (10) plan sections and supporting information. Key findings were also shared with meeting participants including the priority risk index (PRI) as well as public survey findings.

The tabulated PRI results were presented, reviewed, and adjusted based on feedback received by the Planning Committee during the HIRA Meeting. The PRI categorizes hazards into high, moderate, and low-risk groups. High hazards identified for the region included cyber, excessive heat, tornadoes/thunderstorms, flooding, and infectious disease. Initial findings from the public survey revealed tornadoes/thunderstorms as the highest perceived threat and flooding as the second.

Additionally, the project schedule overview was shared with participants during this meeting. The planning process was initiated in February 2024 and the draft plan was delivered by December 2024. All participating jurisdictions are covered under the previous version of the plan, which is set to expire in June 2025. The planning team wants to ensure the plan is approved and adopted prior to this expiration date. The plan website was shared in the chat, which links directly to both the draft plan and the public survey. It was reiterated that the public survey is still up and available.

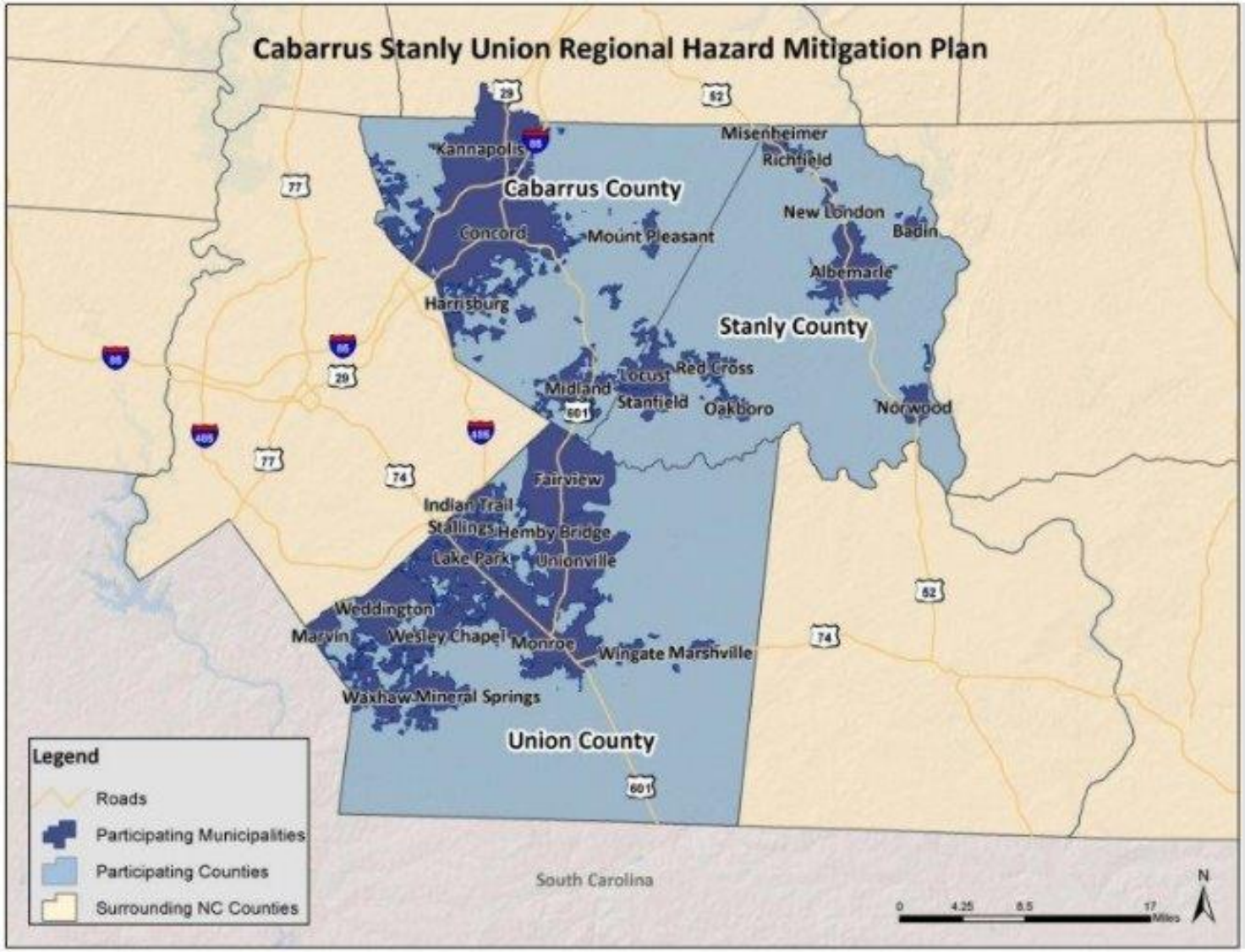
Next steps were shared toward the end of the meeting, including the integration of any additional feedback received at the public meeting, the submittal of the plan to FEMA for review and approval, and the local adoption process. For timing purposes, the local adoption process can occur simultaneously with NCEM and FEMA review, so once approved, the plan will be officially adopted. The adoption process may vary per community, but the most common approach is adoption by resolution.

Cabarrus Stanly Union

2025 Hazard Mitigation Plan Update

Public Meeting #1

February 11th, 2025



Agenda

- Welcome & Introductions
- Meeting Objectives
- Mitigation Overview
- Purpose of Update
- Plan Update Process
- Plan Structure
- Next Steps
- Q&A Session

Introductions

Welcome!

Participating Jurisdictions

Municipalities that participated in the 2025 Plan Update

Union County		Stanly County	
Fairview	Monroe	Albemarle	Red Cross
Hemby Bridge	Stallings	Badin	Richfield
Indian Trail	Unionville	Locust	Stanfield
Lake Park	Waxhaw	Misenheimer	-
Marshville	Weddington	New London	-
Marvin	Wesley Chapel	Norwood	-
Mineral Springs	Wingate	Oakboro	-
Cabarrus County			
Concord		Midland	
Harrisburg		Mount Pleasant	
Kannapolis		-	

Meeting Objectives

Engage the Community

Gather Input

Educate and Inform

Enhance Plan Relevance

What is Mitigation?

“mit-i-gate”

1: to cause to become less harsh or hostile.

2: to make less severe or painful.

Hazard Mitigation

Any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.

Basic Types of Mitigation

Mitigating against hazard impacts on **existing development**

- Houses
- Businesses
- Infrastructure
- Critical Facilities

Ensuring **future development** is conducted in a way that does not increase vulnerability

- Plans
- Policies
- Procedures

Mitigation Techniques

1. Prevention
2. Property Protection
3. Natural Resource Management
4. Structural Projects
5. Emergency Services
6. Education and Awareness

Mitigation Techniques – Examples

Prevention
Planning/Zoning
Building Codes
Open Space Preservation
Floodplain Regulations
Stormwater Mgmt.
Drainage Maintenance

Natural Resource Mgmt.
Floodplain Protection
Watershed Mgmt.
Riparian Buffers
Erosion/Sediment Control
Wetland Restoration
Habitat Preservation

Emergency Services
Warning Systems
Response Equipment
Shelter Operations
Evacuation Planning
Response Training
Sandbagging

Property Protection
Acquisition/Relocation
Building Elevation
Critical Facility Protection
Retrofitting
Safe Room/Shutters
Insurance

Structural Projects
Reservoirs
Dams, Levees, Dikes
Stormwater Diversions
Retention Basins
Channel Modification
Storm Sewers

Education/Awareness
Outreach Projects
Speaker Series
Hazard Map Info
Real Estate Disclosure
Library Materials
Hazard Expositions

Purpose of Update

- Reflect on Changing Risks
- Increase Community Resilience
- Compliance and Funding
- Ensure Preparedness

Purpose of Update – Changing Risks

Population Increase and Community Growth

- Greater Exposure to Hazard Risk
- Increased Exposure = More Damage

More Hazards (Man-Made)

- Included in State Plan
- Ex. Technological, Civil Disturbance, Terrorism

Climate Change

- Anticipated Increase in Frequency and Magnitude
- **New FEMA Requirement

Development Patterns

- Increased Impermeable Surfaces
- More Infrastructure and Assets at Risk

Purpose of Update – Increase Community Resilience

1. Identification of New Vulnerabilities
   - **Vulnerable Populations
2. Adopting Effective Mitigation Strategies

Purpose of Update – Compliance and Funding

Ensure compliance with federal and state requirements

- Disaster Mitigation Act of 2000
- NC GS 166 A

Maintain eligibility for disaster mitigation funding and assistance programs

- HMGP
- FMA
- BRIC
- CRS

Purpose of Update – Ensure Preparedness

The 2025 Plan Update ensures that Cabarrus, Stanly, and Union Counties are better prepared to:

1. Address existing and emerging hazards
2. Protect lives and property
3. Sustain continuity of essential services during and following an event

Plan Update Process

Step 1: Organize Resources

Planning	Planning for Public Involvement
Coordinating	Coordinating with Departments and Agencies
Finalizing	Finalizing a List of Stakeholders for Involvement (HMPC)

Hazard Identification

What Can Happen Here?

- Previously Identified Hazards
- Identify New Hazards

Vulnerability Assessment

What Will be Affected/Impacted?

- Will Use County Parcel Data, FEMA HAZUS Analysis, and NCEM Data

Capability Assessment

How Prepared Are We?

- Communities to Self-Assess Capability
- What Mitigation Actions are Feasible
- Where Gaps Exist

Plan Update Process
Step 2: Risk Assessment

Step 2: Risk Assessment

Hazard ID & Vulnerability Assessment

Identify hazards that could impact the region (existing and evolving)	NEW Civil Disturbance (added based on State HMP) NEW Food Emergency (added based on State HMP)
Evaluate historical data, past incidents, and scientific assessments	Helps determine likelihood and extent Identifies problem/vulnerable areas
Analyze the potential impact of the hazard including future conditions	Describe how climate change may affect magnitude/frequency
Engage stakeholders, experts, and community members to gather insights, experiences and local knowledge	Address gaps in data/modeling

Step 2: Risk Assessment

Hazard ID & Vulnerability Assessment

HIGH RISK	Cyber Excessive Heat Tornadoes/Thunderstorms Flooding Infectious Disease
MODERATE RISK	Drought Hurricanes and Coastal Hazards Severe Winter Weather Earthquakes Geological Dam Failure Wildfires Hazardous Substances Terrorism Food Emergency
LOW RISK	Radiological Emergency Electromagnetic Pulse Civil Disturbance

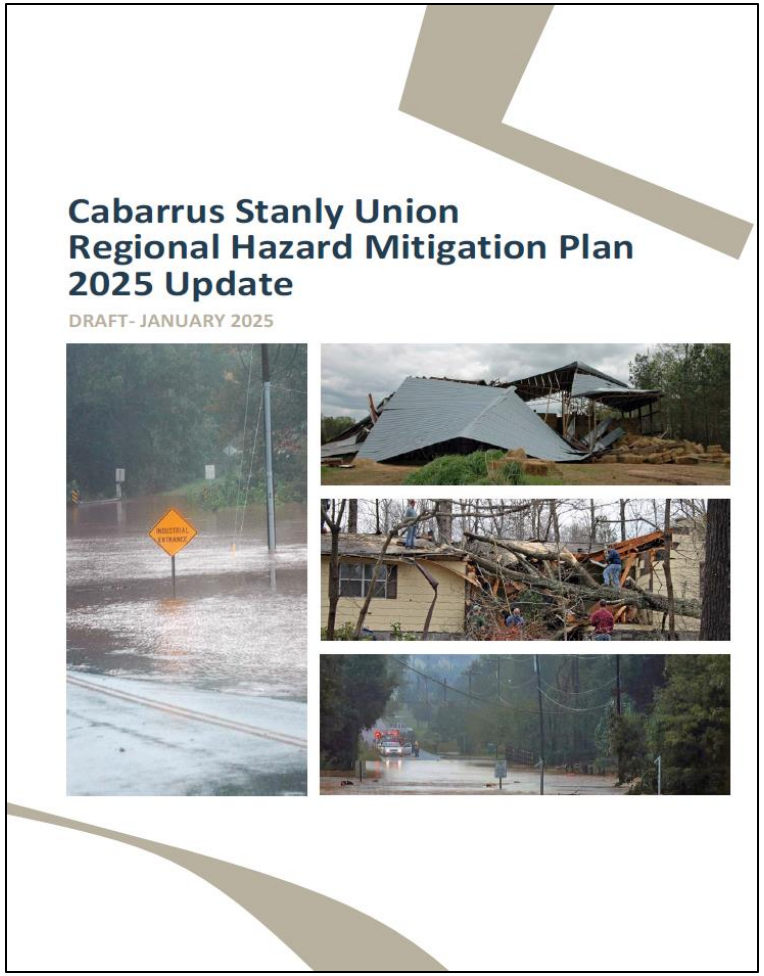
Step 2: Risk Assessment

Capability Assessment

1. What is your community's capacity to prepare for, respond to, and recover from a hazard event?
2. Evaluates resources, capabilities, and readiness to effectively implement/sustain mitigation activities
   - Plans and Regulatory
   - Administrative and Technical
   - Financial Resources
3. Helps identify strengths, weakness, and gaps
   - Informs development of mitigation strategies appropriate/feasible for each community

Plan Update Process
Step 3: Develop a Mitigation Plan

- Setting Planning Goals
- Reviewing Mitigation Alternatives
- Drafting an Action Plan



Step 3: Develop Mitigation Plan

Status Update & New Actions

1. Review previous plan to determine the status of existing actions
   - FEMA Requirement
   - Completed, deleted, progress update
   - "Ongoing" is too broad
2. Identify new mitigation actions to address evolving needs/vulnerabilities
   - Consider BRIC projects for inclusion
   - To be discussed in length at the Mitigation Strategy Meeting

Plan Update Process

Step 4: Adoption and Implementation

Seeking Review and Approval from Relevant Authorities

Securing Funding and Managing Resources of Mitigation Projects and Activities

Executing the Identified Mitigation Actions

Continuously Monitoring the Progress of Mitigation Activities

Project Schedule

Project Kickoff Date – 2/8/24

Larger Stakeholder Meeting –3/13/24

Delivery of Draft – 12/31/24

Public Meeting – 2/11/25

Existing Plan Expiration Date – 6/16/25

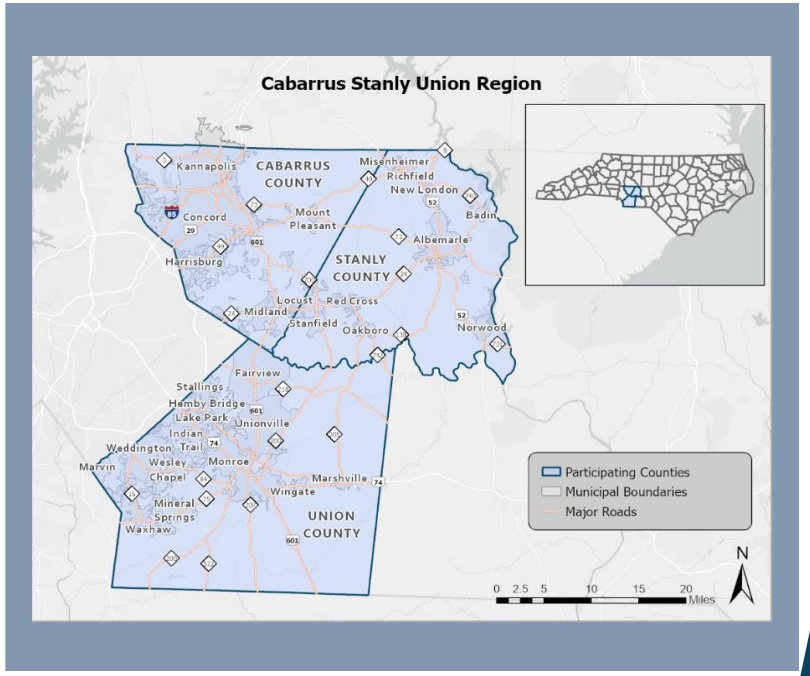
Plan Website

ESP

Cabarrus Stanly Union Hazard Mitigation Plan Update

Welcome to the official website for the Cabarrus Stanly Union Regional Hazard Mitigation Plan 2025 Update!

ESP GIS
January 29, 2025



HMP Update Designated Website Includes:

- Draft Plan
- Process Overview
- Project Information and Materials
- Other Valuable Resources/References

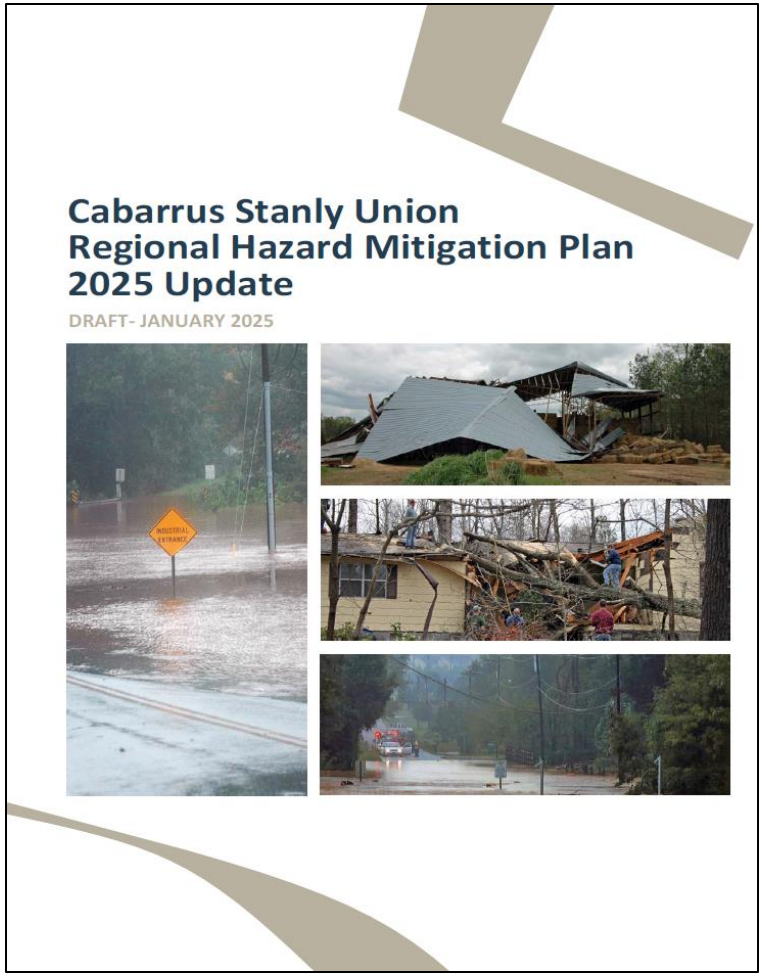
Plan Structure

Section Breakdown

Plan Structure Overview

1. Introduction
2. Planning Process
3. Community Profile
4. Hazard Identification
5. Hazard Profiles
6. Vulnerability Assessment
7. Capability Assessment
8. Mitigation Strategy
9. Mitigation Action Plans
10. Plan Maintenance

Appendices



Plan Structure – Sections

1. **Introduction**
   - I. Background
   - II. Purpose
   - III. Scope
   - IV. Authority
   - V. Summary of Plan Contents

Provides context and justification for the plan

2. **Planning Process**
   - I. Overview of Hazard Mitigation Planning
   - II. History of HM Planning in the Region
   - III. Updating the Plan in 2025
   - IV. Hazard Mitigation Planning Committee
   - V. Meetings and Workshops
   - VI. Involving the Public
   - VII. Involving the Stakeholders
   - VIII. Documentation of Plan Progress

Explains the steps followed to prepare the plan and documents the process

Plan Structure – Sections

3. **Community Profile**
   I. Geography and Environment
   II. Population and Demographics
   III. Housing, Infrastructure, Land Use
   IV. Employment and Industry

Provides an overview of the current conditions in the planning area by participating jurisdiction

4. **Hazard Identification**
5. **Hazard Profiles**
6. **Vulnerability Assessment**

Identifies hazards, exposure, and vulnerability and prioritizes hazards for mitigation

Plan Structure – Sections

7. **Capability Assessment**
   - I. What is a Capability Assessment?
   - II. Conducting the Capability Assessment
   - III. Capability Assessment Findings
   - IV. Conclusions on Local Capability

Details capability indicators by jurisdiction and reviews key capabilities in place

8. **Mitigation Strategy**
   - I. Goals and Objectives
   - II. Identification & Analysis of Mitigation Activities

Reviews the goals and objectives and the process used; details the mitigation action identification and prioritization process

9. **Mitigation Action Plans**
   - I. Participating Jurisdiction Plans

Tables detailing the mitigation actions by jurisdiction

10. **Plan Maintenance**
    - I. Implementation
    - II. Monitoring, Evaluation, and Enhancement
    - III. Continued Public Involvement

Summarizes the HMPC and participating jurisdictions' responsibilities once the plan is adopted

Plan Structure – Supporting Information

Appendices

A. Plan Adoption
B. Planning Tools
C. Local Mitigation Plan Review Tool
D. Planning Process Documentation
E. Completed Mitigation Actions
F. Flood Hazard Maps
G. Wildfire Hazard Maps
H. NCEI Storm Event Data
I. FEMA National Risk Index Report

Complete and Share the Public Survey!

Scan the QR Code for Access to the Public Survey!

Or ACCESS SURVEY HERE

Public Survey – Initial Findings

232 responses thus far (23% respondents live in Concord; 15% from Kannapolis; 11% from unincorporated Cabarrus County)

41% of respondents ranked Tornadoes/Thunderstorms as the highest threat to your community and Flooding (17%) was ranked second highest

53% of respondents have taken measures to make their home more resistant to hazards (tree removal/trimming, drainage improvements, upgraded roof, installed generator)

78% of respondents do not know what office to contact for more information on hazard risk reduction

53% of respondents indicate the internet/social media is the most effective way to receive information; 33% selected mail

Public Survey – Initial Findings

Mitigation Techniques

Respondents were asked the rank the importance of the six mitigation techniques ranging from "Not Important" to "Very Important" – Respondents ranked the following techniques as "Very Important"

1. Emergency Services – 88%
2. Prevention - 86%
3. Natural Resource Protection – 80%
4. Public Education and Awareness – 71%
5. Structural Projects – 68%
6. Property Protection – 48%

Next Steps

1. Record and analyze input received during Public Meeting
2. Await comments from counties and municipalities
3. Await review/compliance comments from FEMA
4. The three counties and each municipality will adopt the plan by resolution.

Questions

Questions/Comments/Concerns

Adjourn – Thank you!

Contact Information:

- Nathan Slaughter - nslaughter@espassociates.com
- Hannah DeLude - hdelude@espassociates.com
- John Flores - jflores@espassociates.com

Cabarrus Stanly Union Regional Hazard Mitigation 2024 Plan Update - Public Survey

We need your help!

Cabarrus, Stanly, and Union Counties and the municipalities within the counties are working together to become less vulnerable to natural and man-made disasters, and your participation in the process is important to us!

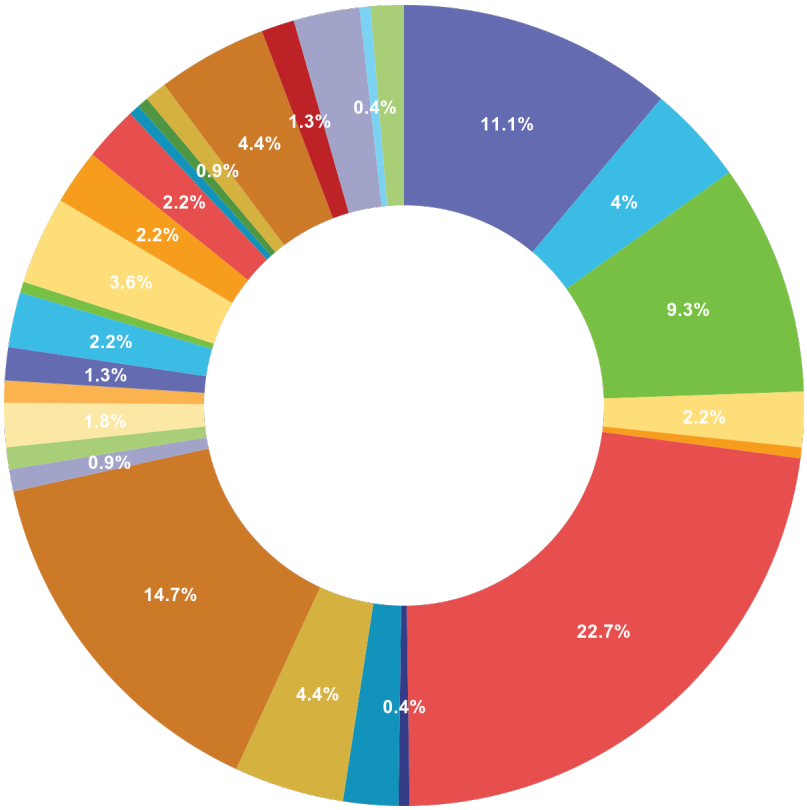
The counties, along with local jurisdictions and other partners, are working to update the multi-jurisdictional Regional Hazard Mitigation Plan. This plan identifies and assesses our community's hazard risks and identifies strategies that determine how to best minimize or manage those risks.

This survey is an opportunity for you to share your opinions and participate in the mitigation planning

process. The information you provide will help us better understand your hazard concerns and can lead to mitigation activities that should help lessen the impacts of future hazard events.

If you have any questions regarding this survey or would like to learn about more ways you can participate in the development in the Cabarrus Stanly Union Regional Hazard Mitigation Plan, please contact Hannah DeLude from ESP Associates, Inc. at hdelude@espassociates.com.

Q1 1\. Where do you live?*

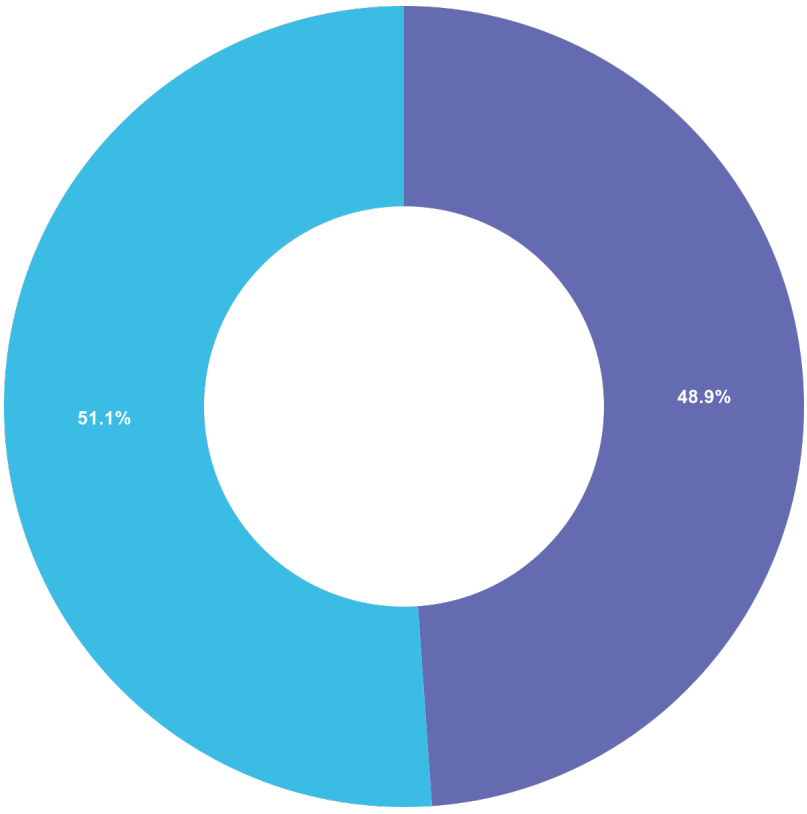


Answered: 225 **Unanswered:** 0

Choice	Total
Unincorporated Cabarrus County	25
Unincorporated Stanly County	9
Unincorporated Union County	21
Albemarle	5
Badin	1
Concord	51
Fairview	1
Harrisburg	5
Hemby Bridge	0
Indian Trail	10
Kannapolis	33
Lake Park	0
Locust	2
Marshville	0
Marvin	2
Midland	4
Mineral Springs	2
Misenhiemer	0
Monroe	3
Mount Pleasant	5
New London	1
Norwood	8
Oakboro	5
Red Cross	5
Richfield	0
Stallings	1
Stanfield	1
Unionville	2

Choice	Total
Waxhaw	10
Weddington	3
Wesley Chapel	6
Wingate	1
Other	3

Q2 2\. Have you ever experienced or been impacted by a disaster?*



Answered: 225 **Unanswered:** 0

Choice	Total
Yes	110
No	115

Q3 3\. If "Yes," please explain.

Tuesday, December 10, 2024 at 4:10 PM UTC

Been through hurricanes and several tornadoes

Monday, September 16, 2024 at 5:52 PM UTC

Tuesday, September 3, 2024 at 11:00 AM UTC

Tornado, flooding, heavy snow

Monday, August 26, 2024 at 10:36 PM UTC

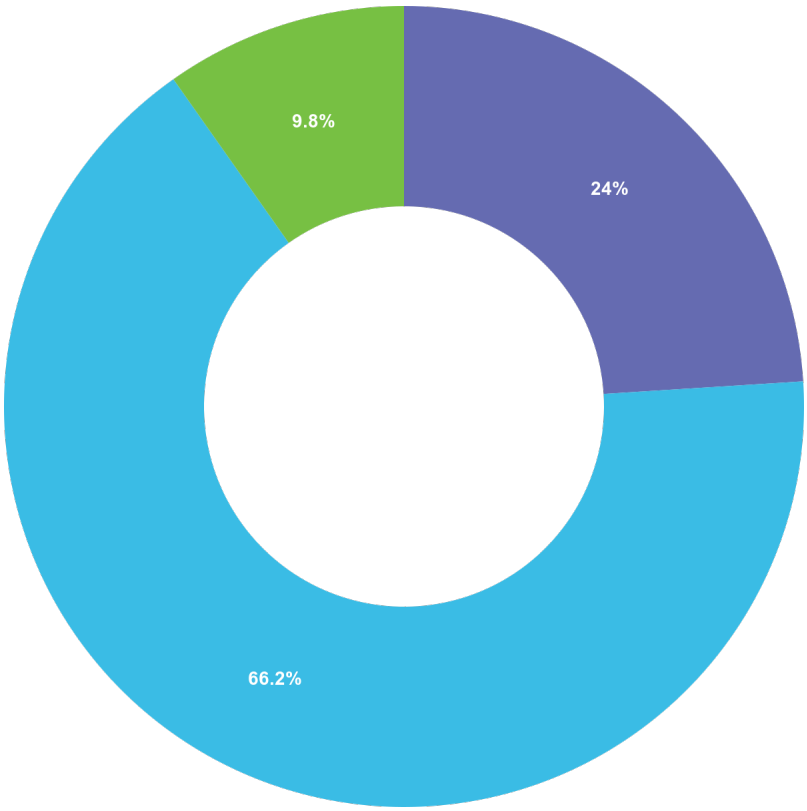
65 mph straight line winds, multiple trees down on property, etc. in Albemarle and also Hurricane Hugo years ago.

Friday, August 23, 2024 at 7:41 PM UTC

Storm that blew a tree over onto our home and damed our property.

Answered: 220 **Unanswered:** 5

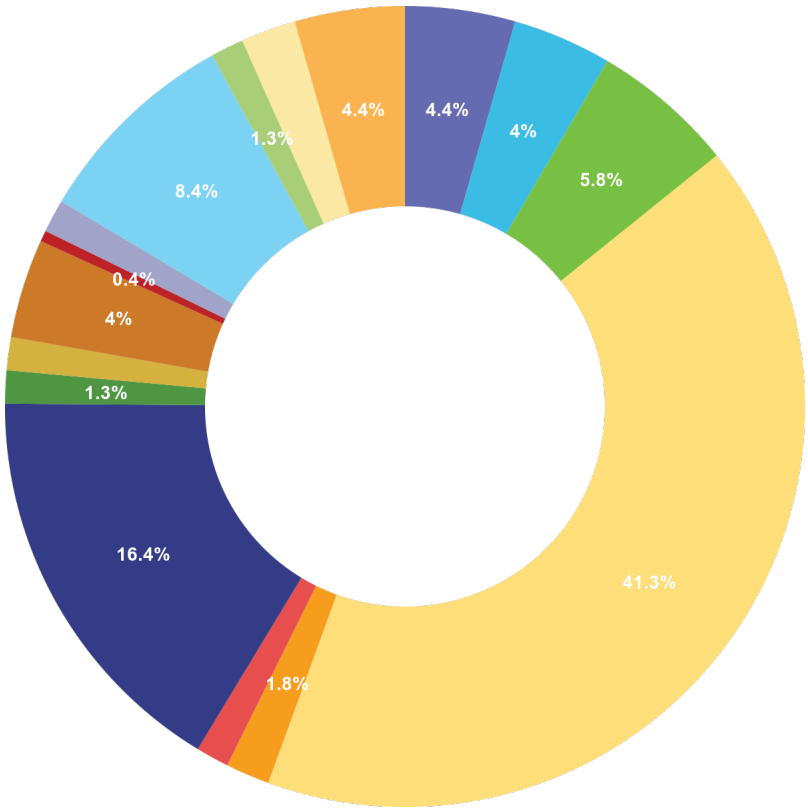
Q4 4\. How concerned are you about the possibility of our community being impacted by a disaster?*



Answered: 225 **Unanswered:** 0

Choice	Total
Extremely concerned	54
Somewhat concerned	149
Not concerned	22

Q5 5\. Please select the **one** hazard you think is the highest threat to your neighborhood:*

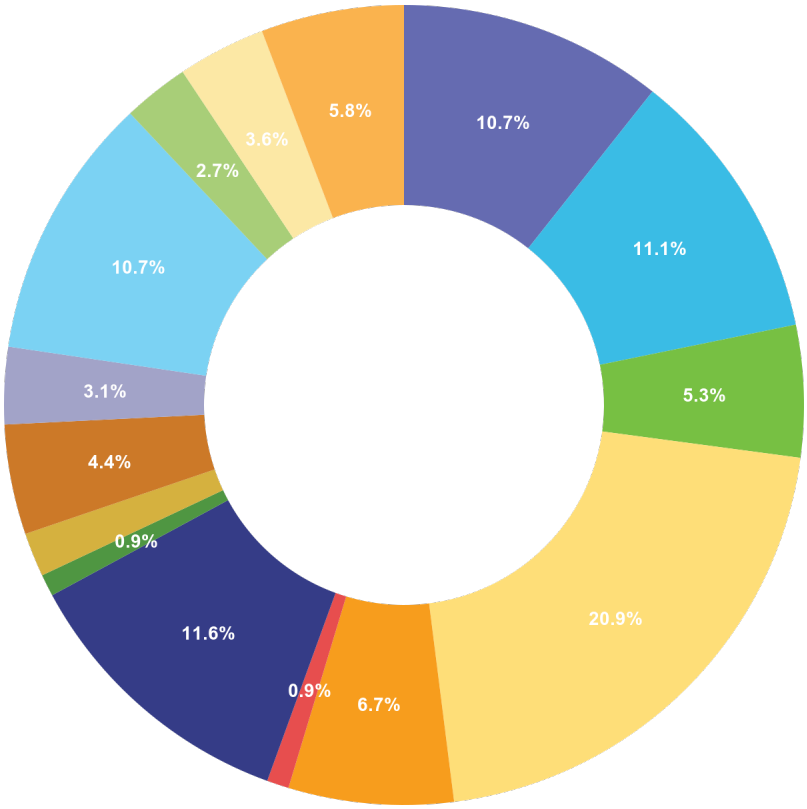


Answered: 225 **Unanswered:** 0

Choice	Total
Drought	10
Excessive Heat	9
Hurricane and Coastal Hazards	13
Tornadoes/Thunderstorms	93
Severe Winter Weather	4

Choice	Total
Dam Failures	3
Flooding	37
Earthquakes	0
Wildfires	3
Infectious Disease	3
Hazardous Substances	9
Radiological Emergency	1
Terrorism	3
Cyber	19
Electromagnetic Pulse	3
Food Emergency	5
Civil Disturbance	10

Q6 6\. Please select the **one** hazard you think is the second highest threat to your neighborhood:*



Answered: 225 **Unanswered:** 0

	Choice	Total
	Drought	24
	Excessive Heat	25
	Hurricane and Coastal Hazards	12
	Tornadoes/Thunderstorms	47
	Severe Winter Weather	15
	Dam Failures	2
	Flooding	26
	Earthquakes	0
	Wildfires	2
	Infectious Disease	4

Choice	Total
Hazardous Substances	10
Radiological Emergency	0
Terrorism	7
Cyber	24
Electromagnetic Pulse	6
Food Emergency	8
Civil Disturbance	13

Q7 7\. Are there any other hazards that you feel pose a wide-scale threat to your community?

Tuesday, December 10, 2024 at 4:10 PM UTC

Fire

Tuesday, October 29, 2024 at 4:24 AM UTC

Heavy use of pesticides and fertilizers

Wednesday, October 2, 2024 at 5:43 PM UTC

Civil disturbance

Monday, September 16, 2024 at 5:52 PM UTC

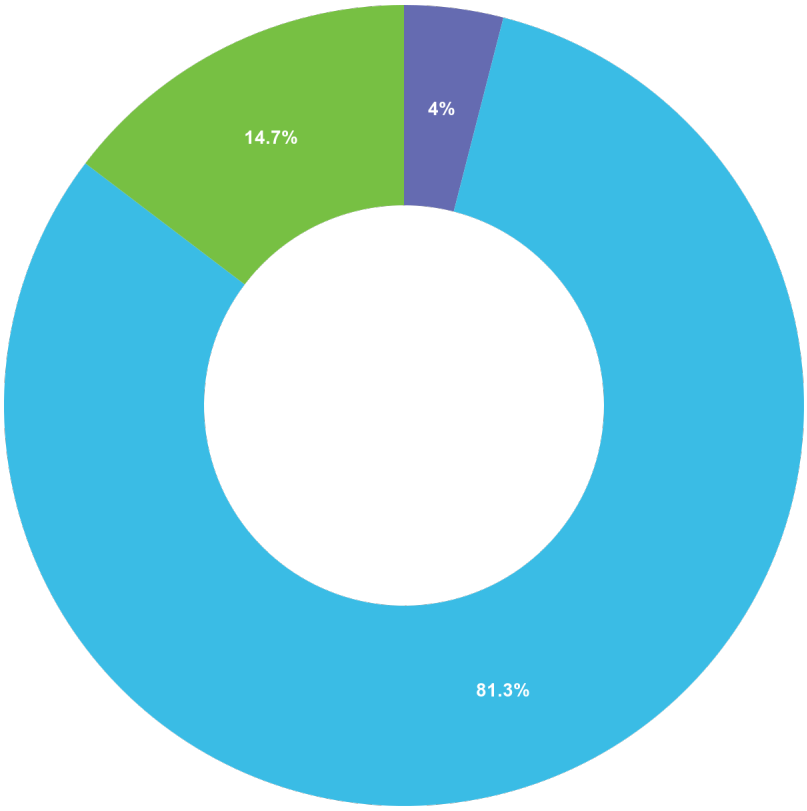
Crime tourism and vagrancy.

Tuesday, September 3, 2024 at 11:00 AM UTC

none

Answered: 220 **Unanswered:** 5

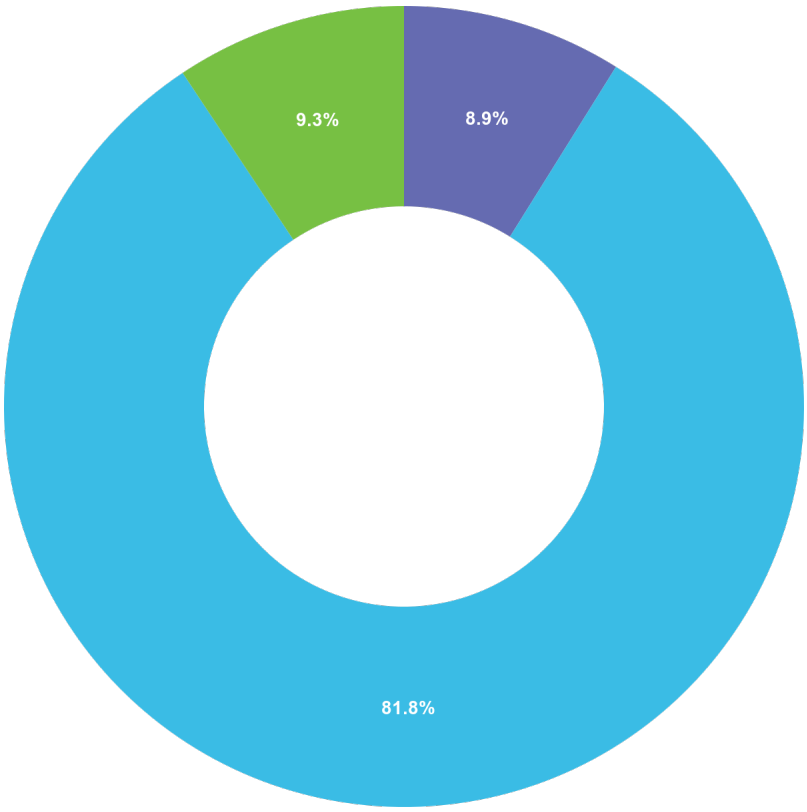
Q8 8\. Is your home located in a floodplain?*



Answered: 225 **Unanswered:** 0

Choice	Total
Yes	9
No	183
I don't know	33

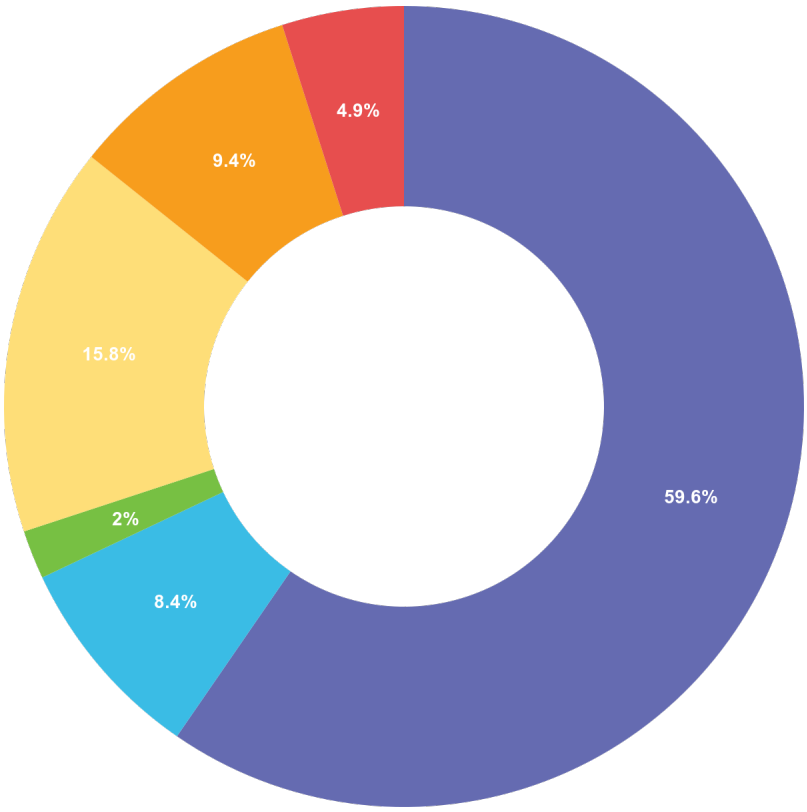
Q9 9\. Do you have flood insurance?*



Answered: 225 **Unanswered:** 0

Choice	Total
Yes	20
No	184
I don't know	21

Q10 10\. If you do not have flood insurance, why not?



Answered: 203 **Unanswered:** 22

Choice	Total
Not located in floodplain	121
Too expensive	17
Not necessary because it never floods	4
Not necessary because I'm elevated or otherwise protected	32
Never really considered it	19
Other	10

Q11 11\. If "Other," please explain.

Tuesday, December 10, 2024 at 4:10 PM UTC

Monday, September 16, 2024 at 5:52 PM UTC

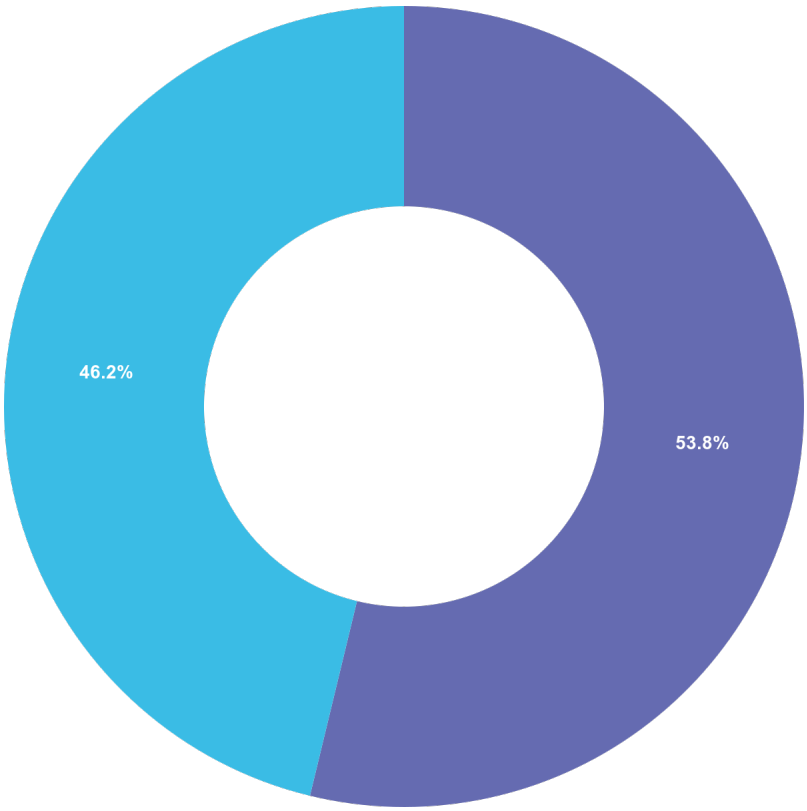
Tuesday, September 3, 2024 at 11:00 AM UTC

Monday, August 26, 2024 at 10:36 PM UTC

Friday, August 23, 2024 at 7:41 PM UTC

Answered: 220 **Unanswered:** 5

Q12 12\. Have you taken any steps to make your home or neighborhood more resistant to hazards?*



Answered: 225 **Unanswered:** 0

Choice	Total
Yes	121
No	104

Q13 13\. If "Yes," please explain.

Tuesday, December 10, 2024 at 4:10 PM UTC

I'm a contractor, I built elevated and additional structural integrity

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Monday, September 16, 2024 at 5:52 PM UTC

Tuesday, September 3, 2024 at 11:00 AM UTC

Monday, August 26, 2024 at 10:36 PM UTC

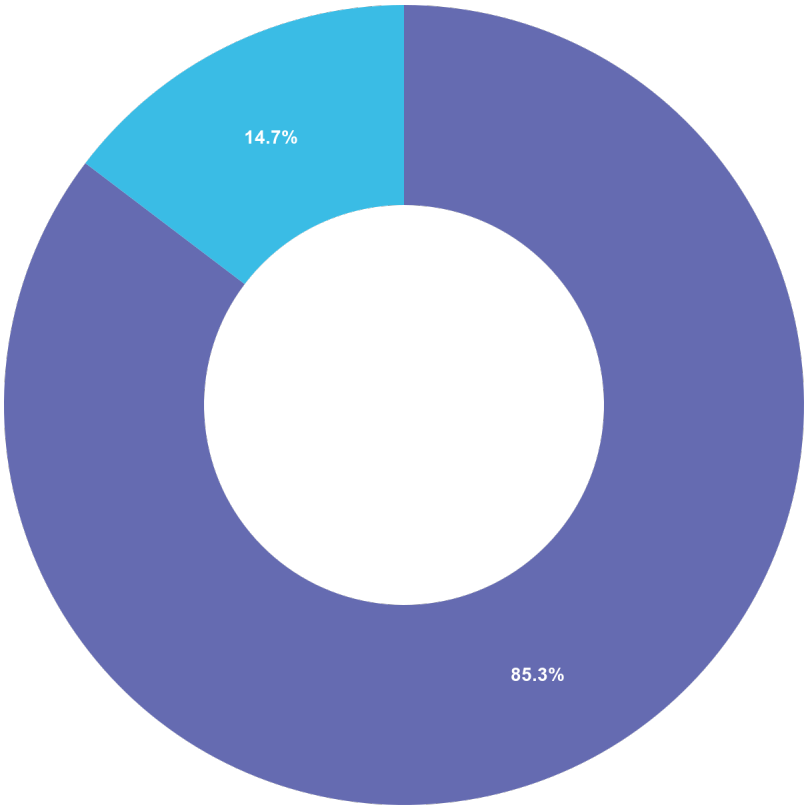
I regularly have dead trees removed and trees pruned properly by an arborist to protect my property and the trees.

Friday, August 23, 2024 at 7:41 PM UTC

We have cut down numerous trees that looked unhealthy or like they could potentially cause damage in bad weather. We also installed a fence around our property, along with lighting that is motion activated to deter thieves and criminals, as we have had property damaged and stolen before.

Answered: 219 **Unanswered:** 6

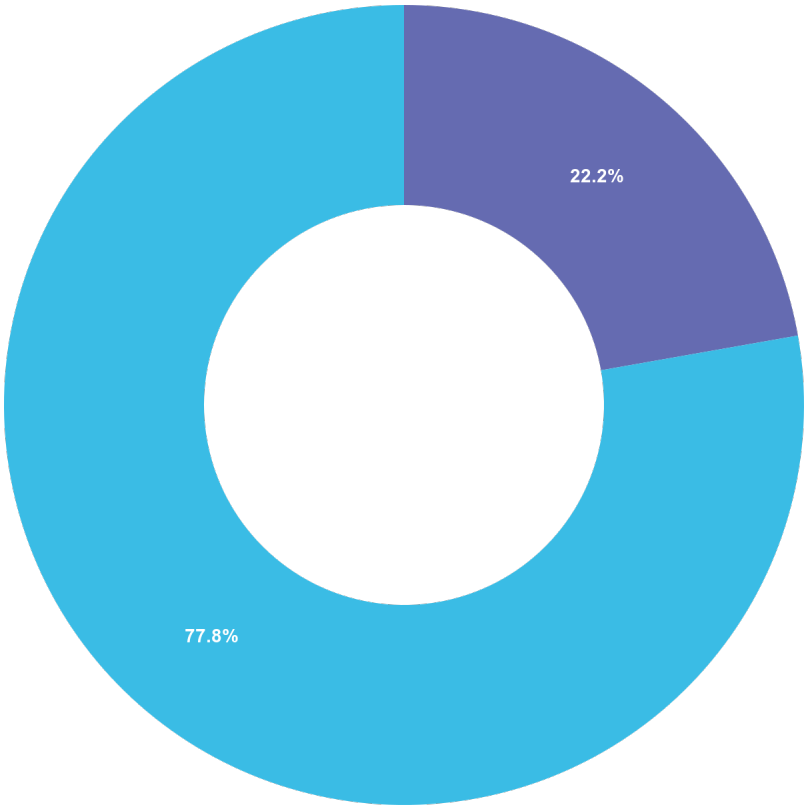
Q14 14\. Are you interested in making your home or neighborhood more resistant to hazards?*



Answered: 225 **Unanswered:** 0

Choice	Total
Yes	192
No	33

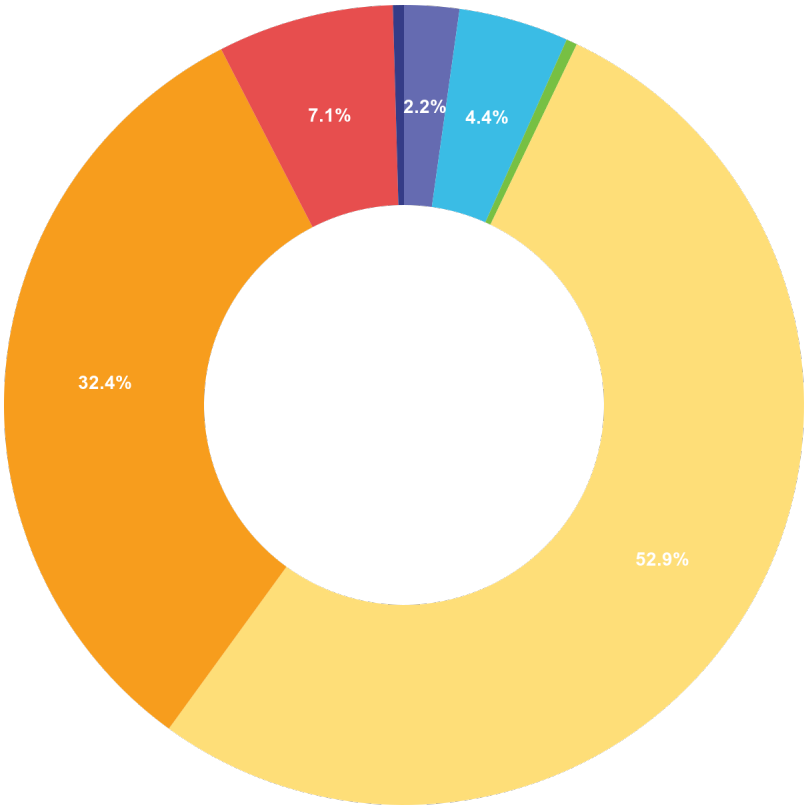
Q15 15\. Do you know what office to contact to find out more information about how to reduce your risks to hazards in your area?*



Answered: 225 **Unanswered:** 0

Choice	Total
Yes	50
No	175

Q16 16\. What is the most effective way for you to receive information about how to make your home and neighborhood more resistant to hazards?*



Answered: 225 **Unanswered:** 0

	Choice	Total
	Newspaper	5
	Television	10
	Radio	1
	Internet (Including Social Media)	119
	Mail	73
	Public Workshops/Meetings	16
	School Meetings	1

Q17 17\. Are there any other ways you prefer to receive information? If so, please explain.

Tuesday, December 10, 2024 at 4:10 PM UTC

Mail

Tuesday, October 29, 2024 at 4:24 AM UTC

Email. Possibly workshops/meetings for the added benefit of community building.

Monday, October 28, 2024 at 8:29 PM UTC

email

Monday, September 16, 2024 at 5:52 PM UTC

Tuesday, September 3, 2024 at 11:00 AM UTC

Answered: 221 **Unanswered:** 4

Q18 18\. In your opinion, what are some steps your local government could take to reduce or eliminate the risk of future hazard damages in your neighborhood?

Tuesday, December 10, 2024 at 4:10 PM UTC

Better assessments and followup

Tuesday, October 29, 2024 at 4:24 AM UTC

Awareness of possible risk associated with, or specific to my area

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Monday, October 28, 2024 at 8:29 PM UTC

drains storms cleared of debris. tress trimmed away from power lines

---

Wednesday, October 2, 2024 at 5:43 PM UTC

Preparedness and proper communication with residents of preparedness and expectations

---

Monday, September 16, 2024 at 5:52 PM UTC

Start facing the reality of crime and vandalism targeting our town. Stop inviting the public to wooded trails behind homes.

Answered: 221 **Unanswered:** 4

Q19 19\. Are there any other issues regarding the reduction of risk and loss associated with hazards or disasters in the community that you think are important?

Tuesday, December 10, 2024 at 4:10 PM UTC

More control on vagrancy and abandoned buildings

Tuesday, October 29, 2024 at 4:24 AM UTC

Just awareness and education.

Monday, September 16, 2024 at 5:52 PM UTC

The Village of Marvin seems focused on commercial development as a priority over resident desires for the existing nature and character to remain - not adding a bar with 100 parking spaces with direct access to a trail behind peoples homes.

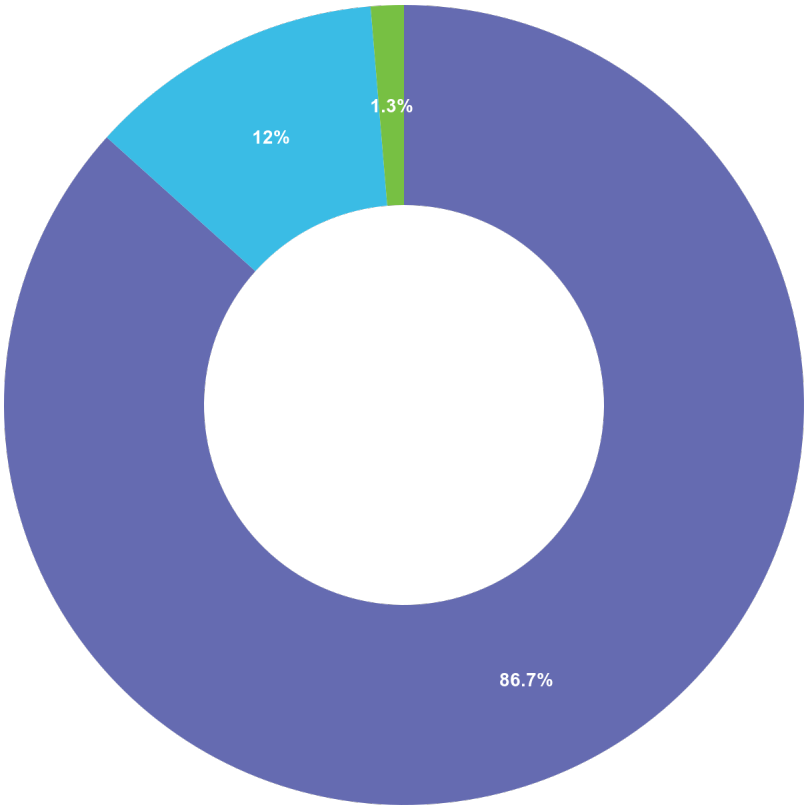
Tuesday, September 3, 2024 at 11:00 AM UTC

Monday, August 26, 2024 at 10:36 PM UTC

Answered: 217 **Unanswered:** 8

Q20 A number of community-wide activities can reduce our risk from hazards. In general, these activities fall into one of the following six broad categories. In the next six questions, please tell us how important you think each one is for your community to consider pursuing.

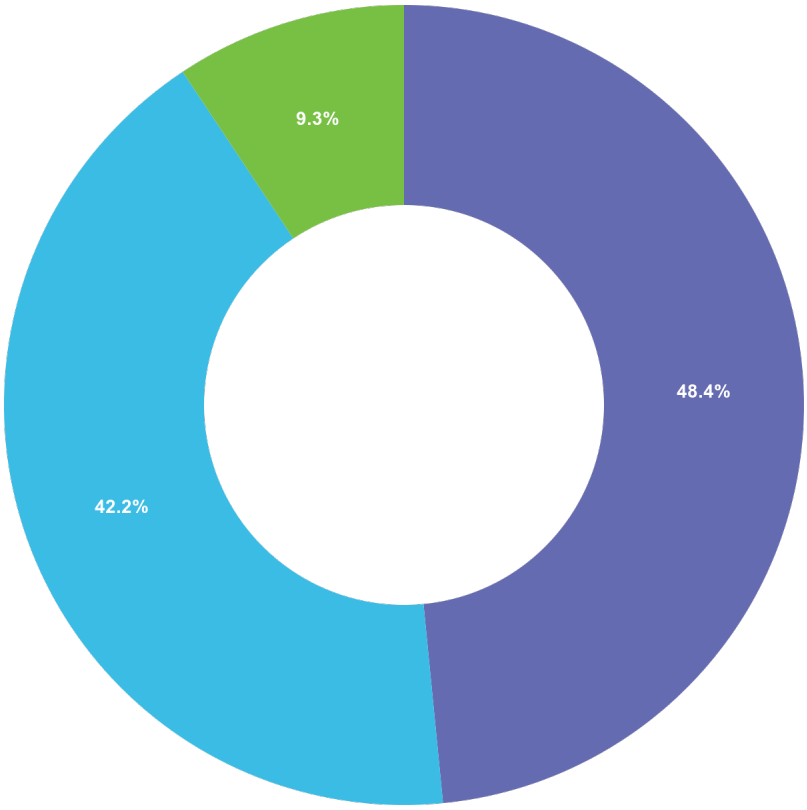
20\. **Prevention** - Administrative or regulatory actions that influence the way land is developed and buildings are built. Examples include planning and zoning, building codes, open space preservation, and floodplain regulations.*



Answered: 225 **Unanswered:** 0

	Choice	Total
	Very important	195
	Somewhat important	27
	Not important	3

Q21 21\. **Property Protection** - Actions that involve the modification of existing buildings to protect them from a hazard or removal from the hazard area. Examples include acquisition, relocation, elevation, structural retrofits, and storm shutters.*

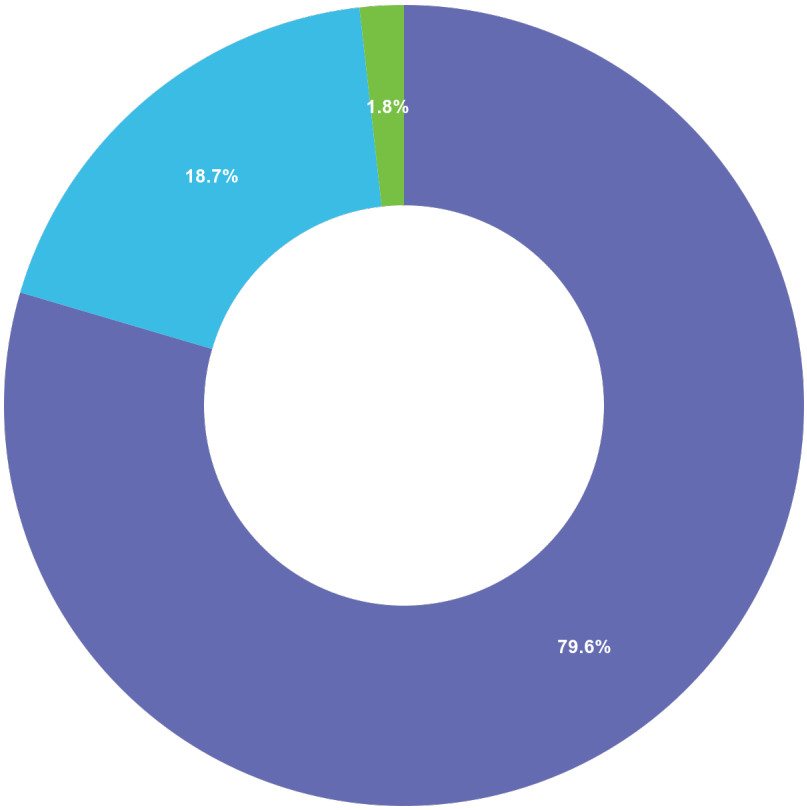


Answered: 225 **Unanswered:** 0

	Choice	Total
●	Very important	109
●	Somewhat important	95
●	Not important	21

Q22 22\. **Natural Resource Protection** - Actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. Examples include: floodplain protection, habitat preservation, slope stabilization, riparian buffers, and forest

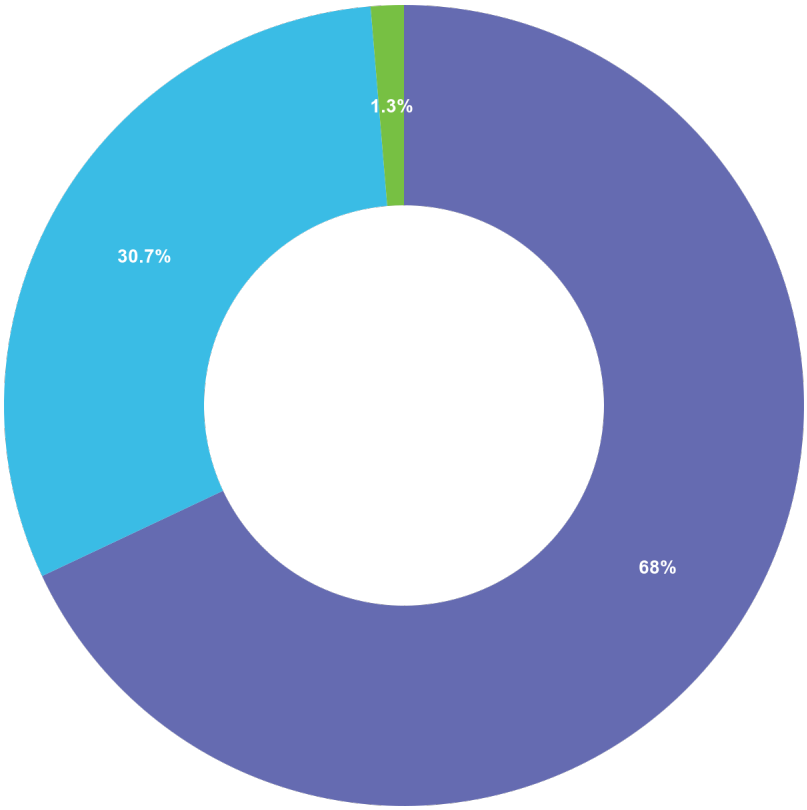
management.*



Answered: 225 **Unanswered:** 0

Choice	Total
Very important	179
Somewhat important	42
Not important	4

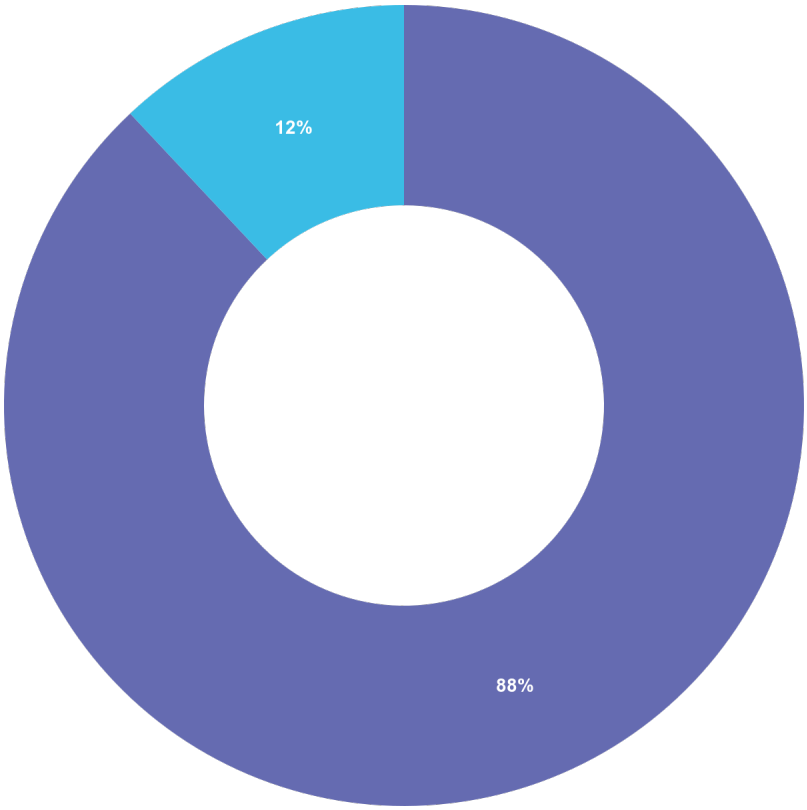
Q23 23\. **Structural Projects - **Actions intended to lessen the impact of a hazard by modifying the natural progression of the hazard. Examples include dams, levees, detention/retention basins, channel modification, retaining walls and storm sewers.*



Answered: 225 **Unanswered:** 0

Choice	Total
Very important	153
Somewhat important	69
Not important	3

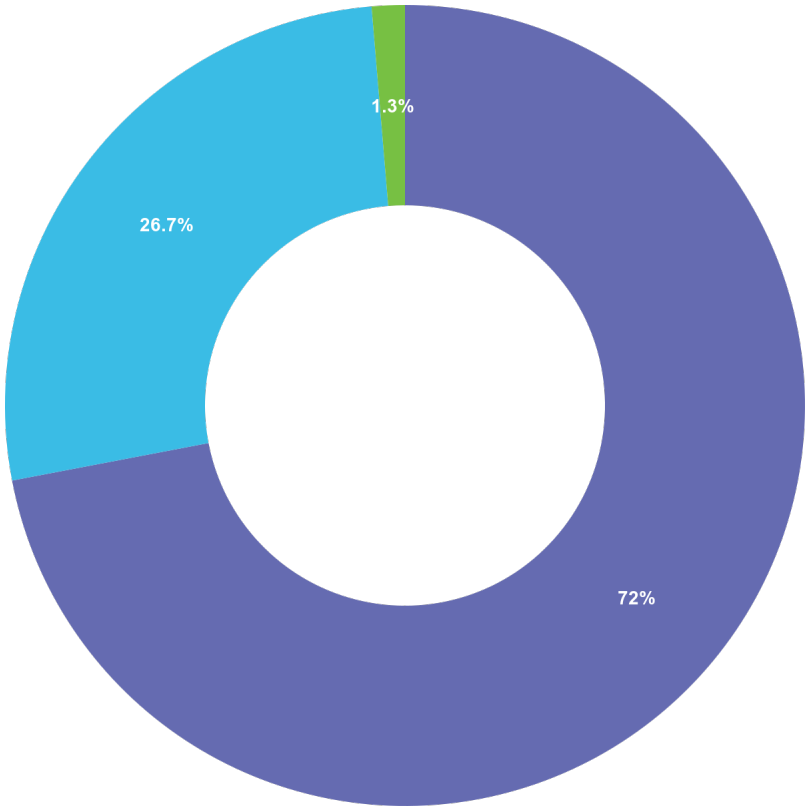
Q24 24\. **Emergency Services -** Actions that protect people and property during and immediately after a hazard event. Examples include warning systems, evacuation planning, emergency response training, and protection of critical emergency facilities or systems.*



Answered: 225 **Unanswered:** 0

Choice	Total
Very important	198
Somewhat important	27
Not important	0

Q25 25\. **Public Education and Awareness** - Actions to inform citizens about hazards and the techniques they can use to protect themselves and their property. Examples include outreach projects, school education programs, library materials and demonstration events.*



Answered: 225 **Unanswered:** 0

Choice	Total
Very important	162
Somewhat important	60
Not important	3

Q26 This survey may be submitted anonymously; however, if you provide us with your name and contact information below, we will have the ability to follow up with you to learn more about your ideas or concerns. (Optional)

Tuesday, December 10, 2024 at 4:10 PM UTC

Tuesday, October 29, 2024 at 4:24 AM UTC

Chelsea Smith
24378 Austin Rd. Albemarle
DoolinSmith@gmail.com
704-701-7659

Monday, September 16, 2024 at 5:52 PM UTC

Chris Comiskey - chris.comiskey@gmail.com - 609-458-1161

Tuesday, September 3, 2024 at 11:00 AM UTC

Monday, August 26, 2024 at 10:36 PM UTC

Answered: 221 **Unanswered:** 4

Appendix E
Completed Mitigation Actions

This section of the Plan includes the mitigation actions that have been completed by the participating jurisdictions.

Cabarrus County Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	Adopt and enforce latest model building codes and national wind engineering standards.	Severe Thunderstorm, Hurricane and Tropical Storm, Winter Storm, Tornado	Moderate	Construction Standards	Local	2019 The County will update versions of building codes and wind engineering standards as new ones become available.	Completed. This is part of the state building code and is handled through Construction Standards. The County implements these codes as part of Construction standards review and subsequent inspections for code compliance. This action will be completed by 2019.
P-2	Require residential construction to meet latest wind-resistance standards; encourage replacement of doublewide garage doors to improve wind resistance.	Severe Thunderstorm, Hurricane and Tropical Storm, Winter Storm, Tornado	Moderate	Construction Standards	Local	2019 The County will update versions of wind engineering standards as new ones become available.	Completed. This is part of the state building code and is handled through Construction Standards. The County implements these standards as part of Construction Standards review and subsequent inspections for code compliance. This action will be completed by 2019.
P-3	Review county building codes to determine if current standards will reduce hazards from winter storms.	Winter Storm	Moderate	Construction Standards	Local	2019 The County will continue to monitor versions of building codes as new ones become available.	Completed. This part of the state building code and is handled through Construction Standards. Implement as part of Construction Standards review and subsequent inspections for code compliance. This action will be completed by 2019.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
P-6	Review/update flood damage prevention ordinance to ensure maximum protection from flood hazards.	Flood	High	Planning and Development, Board of Commissioners, Construction Standards	Local	Completed. The ordinance will remain as it is until changes occur at state or federal level and/or county is advised to change.	Completed. Model ordinance adopted as recommended by the State. Freeboard of 2' adopted as part of the ordinance which exceeds the typical 1' requirement. Current Flood Damage Ordinance is in compliance and will remain until changes occur at state or federal level and/or county is advised to change.
P-9	Revise/update regulatory floodplain maps.	Flood	Moderate	FEMA, NCDENR, NCEM, Planning and Development	Local, State, Federal	Deleted.	This action was moved to the Deleted Actions tab during the 2019 update.
P-12	Review countywide zoning plan or, at a minimum, adopt zoning in floodplain areas to better control future development in these areas.	Flood	High	Board of Commissioners, Municipalities	Local	Action completed. This action will be removed from future plan updates.	Completed. Cabarrus County has zoning through the county, In 2005, the Cabarrus County zoning ordinance regulations were updated to include a requirement that for any new subdivisions, the floodplain must be included as part of the open space. The Cabarrus County flood damage prevention ordinance also applies to unincorporated county.
P-13	Delineate preferred growth areas and develop are plans for target locations.	Flood	High	Board of Commissioners, Municipalities	Local	Action completed. This action will be removed from future plan updates.	Completed. Cabarrus County has co-adopted plans with the City of Concord and with the Town of Harrisburg to encourage development where infrastructure investments have already been made. New subdivision development regulations require that.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
P-16	Review Capital Improvement Plan to ensure no public facilities proposed for flood hazard areas; amend as necessary. Protect new critical facilities (e.g. schools, hospitals, fire, shelters) to 2 feet above the 100 year flood elevation (5 feet above BFE).	Flood	Moderate	Board of Commissioners, Municipalities, Board of Education	Local	This action will be revisited by 2019.	Delete. County does not construct any new critical structures in regulated floodplain.
P-17	Prepare countywide storm water management plan covering river basins.	Flood	Low	DENR, NRCS	State	2015	Delete. County is not a utility provider. Storm water management through cities and towns only. County is subject to Phase II post construction permitting with the state but that is for individual sites. County considering local Erosion Control program for 2020.
P-20	Develop plan for relocating public infrastructure out of flood hazard areas.	Flood	Low	Emergency Management, General Services, Municipalities	Local	This action is being deleted because the County is not a utility provider and does not maintain infrastructure.	This action was moved to the Deleted Actions tab during the 2019 update.
P-23	Track benefits of flood loss reduction.	Flood	Moderate	Planning and Development, Emergency	Local	This action is being deleted.	This action was moved to the Deleted Actions tab during the 2019 update.
P-24	Produce annual progress reports on how plan is being implemented, send with annual CRS recertification.	All Hazards	Low	Planning and Development	Local	This action is being deleted because it is not a CRS requirement.	This action was moved to the Deleted Actions tab during the 2019 update.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Property Protection							
PP-1	Ensure that manufactured homes are installed and properly secured.	Severe Thunderstorm, Hurricane and Tropical Storm, Winter Storm, Tornado	High	Construction Standards, Planning and Development	Local	This action has been completed and is ongoing through enforcement of Constructions Standards review. It will be removed from future plan updates.	Completed. This is part of the state building code and is handled through Construction Standards. Implement as part of Construction Standards review and subsequent inspections for code compliance.
PP-2	Ensure doorframes are securely anchored, especially double doors that can be very dangerous in high winds if not securely fastened.	Severe Thunderstorm, Hurricane and Tropical Storm, Winter Storm, Tornado	Moderate	Construction Standards, Planning and Development	Local	This action has been completed and is ongoing through enforcement of Constructions Standards review. It will be removed from future plan updates.	Completed. This is part of the state building code and is handled through Construction Standards. Implement as part of Construction Standards review and subsequent inspections for code compliance.
PP-3	All new, remodeled or repairs to substantially damaged buildings should be elevated to the base flood elevation to a minimum of 2 feet above BFE.	Flood	Moderate	Board of Commissioners, Municipalities, Construction Standards	Local	This action has been completed and is ongoing through enforcement of the Flood Damage Prevention Ordinance. It will be removed from future plan updates.	Completed. This is required as part of the FDPO.
PP-5	Review any rebuilding strategies in wake of local emergencies and consider policies/procedures for minimizing repetitive losses.	Flood	Low	Board of Commissioners, Municipalities, Planning and Development, Construction Standards	Local	This action is implemented as needed through the enforcement of regulations and construction standards. It will be removed from future plan	Structures could not be built back unless they met current codes for building, which now includes flood regulations. Implement as part of Construction standards review and subsequent inspections for code compliance.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
PP-6	Prohibit enclosures to the lower areas of elevated buildings, including breakaway walls.	Flood	High	Planning and Development, Construction Standards, Municipalities	Local	This action is implemented as needed through construction standards. It will be removed from future plan updates.	Completed. This part of the state building code and is handled through Construction Standards. Implement as part of Construction Standards review and subsequent inspections for code compliance.
PP-7	Continue to require and maintain FEMA elevation certificates for new buildings or improvements to buildings on lots including any portion of 100 year floodplain.	Flood	High	Planning and Development, Construction Standards	Local	This action is implemented as needed through the enforcement of the Flood Damage Prevention Ordinance. It will be removed from future plan updates.	Elevation certificates are required for development on parcels which have 100 year floodplain present. (Pre-construction and post-construction required).
PP-8	Advise/assist property owners in retrofitting their businesses and homes. Retrofitting means modifying an existing building or yard to protect the property from flood damage.	Flood	Moderate	Planning and Development, Construction Standards	Local	This is an ongoing activity that represents the County's mitigation capability. It will be removed from future plan updates.	Ongoing. Construction Standards staff provides technical assistance for construction as needed.
PP-9	Develop an open space plan.	Flood	Moderate	Planning and Development, Soil and Water	State	This action will be deleted and will not be included in future updates of the hazard mitigation plan.	Deleted. Due to no funding and county policies.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
SP-1	Establish coordinating committee to ensure that responsible parties communicate to ensure maximum cooperation in developing and maintaining the county's drainage systems.	Flood	Low	Engineering, Drainage Districts, NCRS Environmental Health	Local	This action will be deleted and will not be included in future plan updates.	Deleted. Cabarrus is not a utility provider.
SP-2	Establish/maintain coordinated Construction Standards program.	Flood	Moderate	Municipal Public Works	Local	This action is complete and will be removed from future plan updates.	Complete and ongoing. The state building code is used and administer through Construction Standards.
Public Education and Awareness							
PEA-1	Maintain current Early Warning System/Dissemination of information alerting town residents when to seek shelter when high winds or other hazards are expected.	All Hazards	Moderate	Emergency Management, Sheriff	Local	This action is complete and will be removed from future plan updates.	Complete and ongoing. Early Warning System/Dissemination of information is used to alert residents when to seek shelter when high winds expected.
PEA-6	Maintain library on retrofitting techniques and publicize through bulletins/newsletters.	Flood	Low	Planning and Development, Construction Standards	FEMA, USACE	This action is complete and ongoing. It will be removed from future plan updates.	This is typically handled by engineered drawings and in conjunction with Construction Standards and the building code. Construction Standards staff provides technical assistance for construction as needed.
PEA-7	Maintain hazard awareness program (elevation certificates, FIRM data, bulletin on property protection measures and flood insurance, etc.).	Flood	Moderate	Planning and Development, Communications and Outreach, Banks, Real Estate Agents, Insurance Agents, Chamber of Commerce	Local	This is an ongoing activity required for CRS credit. This action will be removed from future hazard mitigation plan updates.	Complete and ongoing. Required as part of CRS program. Maintain current information in office and on website.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
PEA-9	Establish a Flood Awareness Week to publicize hazard and protection measures.	Flood	Low	Communication and Outreach, Planning and Development, Board of Commissioners, Municipalities, Local Media	Local	This action is complete and ongoing. It will be removed from future plan updates.	Completed. FEMA does an outreach campaign each March in which Cabarrus County participates. Information provided directly from FEMA is disseminated through social media and the Cabarrus County website.
PEA-10	Request that the real estate Multiple Listing Service (MLS) be amended to include notice of flood hazard and the requirement to purchase flood insurance.	Flood	High	Board of Commissioners, Municipalities, Planning and Development, Real Estate Agents	Local	This action will be deleted and will not be included in future plan updates.	Deleted. These databases are handled through local realty groups (i.e., Charlotte Regional, Cabarrus Regional etc.). They have other ways to verify flood data. Liability if placed on site.

City of Concord Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-9	Continue to provide and maintain NIMS training for all departments and key government officials.	All Hazards	Moderate	All Departments, Emergency Management	DHS, EMI, Community Colleges	This is an ongoing action that will be removed from future plan updates.	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the City's mitigation capability. The initial implementation of training was successful and on-line. FEMA courses have been a good resource. Uncertainty remains if departments are still addressing new hires.
P-10	Promote better communication and coordination between floodplain management division and Business and Neighborhoods and Emergency Management.	Flood	Moderate	Business and Neighborhoods, Emergency Management	N/A	This is an ongoing action that will be removed from future plan updates.	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the City's mitigation capability. Success of this measure resulted in improvement to the community CRS rating. The divisions are in contact and work together to address flood issues.
Property Protection							
PP-3	Burial of new power lines in sub-divisions and evaluation of burial of existing power lines.	Winter Storm, Tornado, Hurricanes and Tropical Storm, Severe Thunderstorm	Moderate	Electric	HMGP, 406 Mitigation, Economic Development	This is an ongoing action that will be removed from future plan updates.	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the City's mitigation capability.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Emergency Services							
ES-1	Clearly mark detours during events and recovery operations that cause obstructed roadways.	All Hazards	Moderate	Transportation, Streets	Transportation	This is an ongoing action that will be removed from future plan updates.	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the City's mitigation capability. The Streets Department developed a response trailer equipped to implement emergency detours which has been successfully deployed multiple times.
ES-2	Maintain resources to adequately control traffic such as barricades, barriers, cones, and signs.	All Hazards	Moderate	Transportation, Streets	Transportation, Police, Fire and Life Safety	This is an ongoing action that will be removed from future plan updates.	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the City's mitigation capability. Several departments maintain these including Streets, Fire, and Police. Streets has developed a "detour" trailer equipped with resources to respond to developing situations. An I-85 detour plan is in place and road closure information is posted on the City's web page.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
ES-3	Develop Emergency Operations Plans for dams.	Dam Failure	Moderate	Water Resources, Emergency Management	Water resources, WSAAC	Action completed. Will be removed from future hazard mitigation plan updates.	Completed. These plans are developed. The first tabletop exercise was completed in 2014. Results of the exercise will provide knowledge of the plan contents by responsible parties.
ES-4	Develop evacuation and detour routes.	Flood	High	Streets, Police, Fire	Local, Stormwater, Business and Neighborhoods, FMA, HMGP	Action completed. This action will be removed from future plan updates.	Complete. These have been developed for rail incidents though identified flood prone area and detour routes have not been posted to the internet. Annual review and incident review of flood events are conducted.
Public Education and Awareness							
PEA-5	Develop public information and alerting system for dam failure based on plans.	Dam Failure	High	Water Resources, Public Affairs and Project Manager, Emergency Management	Water Resources, WSAAC	Action completed. This action will be removed from future updates.	Completed. The Blackboard system and notification through the Emergency Alert system remain effective means of notification.
PEA-6	Continue emergency notification system (Connect CTY) to notify citizens of hazards and emergencies.	All Hazards	Moderate	Public Affairs	City Administration	Action completed. This action will be removed from future updates.	Completed. Blackboard has replaced Connect CTY.
PEA-8	Conduct NFIP Educational Programs.	Flood	High	Business and Neighborhoods	Local, FEMA	This action has been completed and will be removed from future plan updates.	Completed. These programs are provided upon request and should be considered part of the city's capabilities.
PEA-9	Encourage residents to keep storm drains clear of debris during storm events.	Flood	High	Stormwater	Local, FEMA	This is an ongoing action that will be removed from future plan updates	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the City's mitigation capability. Brochures and information on web page.

City of Kannapolis Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2025)
Public Education and Awareness							
PEA-1	Provide tours of city's water treatment plant facility as part of Kannapolis Citizen's and Employee Academy.	Flood, Storm	Moderate	Public Works	Local	Annually	This has been implemented and is underway annually. This action will be removed from the 2030 plan.
PEA-2	Conduct classroom presentations on environmental issues to Kannapolis City and Cabarrus County school children.	All Hazards	Moderate	Public Works	Local	Annually	This has been implemented and is underway annually for all third graders in the Kannapolis School System. This action will be removed from the 2025 plan.

Town of Midland Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	In conjunction with Cabarrus County Government, adopt and enforce latest model building codes and national wind engineering standards.	Severe Thunderstorm, Hurricane and Tropical Storm, Winter Storm, Tornado	Moderate	Town Council, Cabarrus County Construction Standards	Local	This action is being deleted and will not appear in future updates of the hazards mitigation plan.	Enforcement of the building codes is a County function. This action is being deleted.
P-2	Review plan for debris removal and disposal.	Winter Storm	High	Town Council	Local, EMPG	This action is being deleted and will not appear in future updates of the hazards mitigation plan.	Implementation and maintenance of the debris removal and disposal plan is a County function. This action is being deleted.
P-3	In conjunction with Cabarrus County Planning and Development Department, review/update flood damage prevention ordinance to ensure maximum protection from flood hazard events.	Flood	High	Town Council	Local	The ordinance will remain as it is until changes occur at state or federal level and/or county is advised to change.	Completed. Model ordinance adopted as recommended by the State in November 2018. Freeboard of 2' adopted as part of the ordinance which exceeds the typical 1' requirement. Current Flood Damage Ordinance is in compliance and will remain until changes occur at state or federal level and/or county is advised to change.
P-4	Revise/update regulatory floodplain maps with Cabarrus County Planning and Development Department.	Flood	Moderate	FEMA, NCDER, NCEM	Local, State, Federal	This action will be deleted from future plan updates.	Deleted. Not a Town function. Updated maps were provided by FEMA in November of 2008. Revised panels were also provided in February 2014.

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
P-8	Adopt policies that discourage growth in flood hazard areas, including policy on not extending public services or utilities into flood hazard zones.	Flood	Moderate	Town Council, Planning and Zoning Commission	Local	This action is being deleted and will not appear in future updates of the hazard mitigation plan.	The County enforces the flood damage prevention ordinance which regulates development in the floodplain.
Property Protection							
PP-1	Ensure that manufactured homes are installed and properly secured.	Severe Thunderstorm, Hurricane and Tropical Storm, Winter Storm, Tornado	High	Town Council, Cabarrus County Construction Standards	Local	This action is being deleted and will not appear in future hazard mitigation plan updates.	Enforcement of building codes is a County function. This action is being deleted.
PP-2	All new, remodeled or repairs to substantially damaged buildings should be elevated to the base flood elevation to a minimum of 2 feet above BFE. Consider prohibiting construction or	Flood	Moderate	Town Council	Local	This action is being deleted and will not appear in future hazard mitigation plan updates.	Enforcement of building codes and the flood damage prevention ordinance are County functions. This action is being deleted.
PP-3	Review any rebuilding strategies in wake of local emergencies and consider policies/procedures for minimizing repetitive losses.	Flood	Low	Town Council	Local	This action is being deleted and will not appear in future hazard mitigation plan updates.	Enforcement of building codes is a County function. This action is being deleted.
PP-4	Advise/assist property owners in retrofitting their businesses and homes. Retrofitting means modifying an existing building or yard to protect the property from flood damage.	Flood	Moderate	Planning and Zoning Commission, Town Council	Local	Ongoing – action will be removed from future plan updates	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the County's mitigation capability.

Public Education and Awareness							
PEA-3	Develop and implement hazard awareness program (elevation certificates, FIRM data, bulletin on property protection measures and flood insurance, etc.).	Flood	Moderate	Town Council, Midland Volunteer Fire Department	Local	This is an ongoing activity required for the County's CRS credit. This action will be removed from future hazard mitigation plan updates.	Complete and ongoing. Required as part of the County's CRS program. Maintain current information in office and on website.
PEA-4	Establish a Flood Awareness Week to publicize hazard and protection measures.	Flood	Low	Town Council	Local	This action is complete and ongoing. It will be removed from future plan updates.	Completed. FEMA does an outreach campaign each March in which Cabarrus County participates. Information provided directly from FEMA is disseminated through social media and the Cabarrus County website.
PEA-5	Request that the real estate Multiple Listing Service (MLS) be amended to include notice of flood hazard and the requirement to purchase flood insurance.	Flood	High	Town Council	Local	This action will be deleted and will not be included in future plan updates.	Deleted. These databases are handled through local realty groups (i.e., Charlotte Regional, Cabarrus Regional etc.). They have other ways to verify flood data. Liability if placed on site.

Town of Mount Pleasant Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Emergency Services							
PEA-5	Request that the real estate Multiple Listing Service (MLS) be amended to include notice of flood hazard and the requirement to purchase flood insurance.	Flood	Low	Town Council (policy support)	Local	Ongoing	This does not appear to be a responsibility of local government but more of a policy stance regarding the MLS.

Stanly County Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	No building in floodplain.	Flood	High	Planning	N/A	Ongoing – action will be removed from future plan updates	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the County's mitigation capability.
P-3	Investigate CRS program	Flood	Moderate	Planning	Local	2019	Delete. The value of potential property loss did not justify implementation. It was not cost effective to implement the program based on the properties involved.

City of Albemarle Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-2	Map the geographic boundaries of flood areas using Geographic Information Systems (GIS Technology).	Flood	Moderate	Engineering	Local	2024	Completed. Stanly County currently maintains a floodzone GIS layer that delineated the geographic boundaries of flood areas.

City of Locust Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	Develop a stormwater management plan.	Flood	Moderate	Transportation	General Fund	This action has been completed and will be deleted from future plan updates.	Complete. Action will be deleted from future plan updates.
P-2	Saferoom requirements/ordinance in new construction.	Tornado, Severe Thunderstorm, Hurricane and Tropical Storm, Winter Storm	Moderate	Planning	General Fund	This action has been completed and will be deleted from future plan updates.	Complete. Action will be deleted from future plan updates.
Emergency Services							
ES-1	Conduct a comprehensive study on emergency communications issues in our area.	All Hazards	Moderate	Fire Department	General Fund	This action has been completed and will be deleted from future plan updates.	Complete. Action will be deleted from future plan updates.

Union County Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-4	Research, develop and adopt a local tree ordinance that will encourage the preservation of healthy trees in large-scale developments and the removal of "hazard" trees along public rights of way as part of the Land Use Ordinance.	Hurricane and Coastal Hazards, Severe Winter Weather, Thunderstorm	Low	Planning	N/A	2019	This action is complete. New UDO encourages preservation of existing trees in non-buildable areas over 12" in diameter by requiring mitigation at 125% for trees that are removed. Hazardous tress that would be otherwise maintained are allowed to be removed after approval by the County's Urban Forester.
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flood	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2019	Adopted a Parks and Greenway Plan that encourages greenway development and floodplain preservation.
Emergency Services							
ES-1	Provide for alternate power or pumping capabilities at major lift stations.	Flood	Low	Public Works	Water and Sewer Fund	2019	New replace pumps have been installed @ lift-station where required to meet the 2.5 times peak average flow guidelines. Additionally, back-up pump station sources have been secured for redundancy.

Public Education and Awareness							
PEA-4	Increase awareness of fire safety techniques via the Adult Fire Prevention Program.	Wildfire	Low	Fire Services, Red Cross	DHS, Citizen Corps, FEMA/Red Cross publications	2015, Annual review and update of material	Union County through a grant has purchased an all-hazard education trailer which will target hazards, such as fire, flooding - weather and emergency communications.

Town of Fairview Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Public Education and Awareness							
PEA-2	Raise public awareness of natural hazards that could affect the area	All Hazards	Moderate	Emergency Management	Local	2019	This action is complete.

Town of Hemby Bridge Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flood	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2019	Adopted a Parks and Greenway Plan that encourages greenway development and floodplain preseervation. Also, adopted the Hemby Bridge Small Area Plan in 2018 that encourages floodplain and open space preservation along with greenways.

Town of Indian Trail Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	Maintain Minimum Housing Ordinance.	Flood	Moderate	Town Planning and Zoning	Local	Action will be removed from future hazard mitigation plan updates.	This is an ongoing action that will be removed from future plan updates and will be discussed in the Capability Assessment section as an ongoing policy that improves the Town's mitigation capability.
P-4	Draft and adopt a Stormwater Master Plan	Flood	Moderate	Engineering	Stormwater Utility	2019	This action is complete. We are a Phase II stormwater permitting program.
P-5	Achieve CFM Certification	Flood	Moderate	Engineering	Stormwater Utility	2019	This action is complete. We are a Phase II stormwater permitting program.

Town of Marshville Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	Revise Land Use Plan to include mitigation elements.	All Hazards	Moderate	Planning Board, Land Use Administrator, Town Administrator	Local, General Fund	2019	The Town Plan 2015 Land Use & Comprehensive Master Plan was adopted in 2016. Its goals include preservation of open space and its actions address the protection and enhancement of tree cover.
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flood	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2019	The Town Plan 2015 Land Use & Comprehensive Master Plan includes this action in its vision and is therefore complete.

Village of Marvin Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	Regularly calculate/document the amount of flood prone property	Flooding	Moderate	Planning, GIS	Local, General Funds	Annually	This action is complete and takes place every year.
Natural Resource Protection							
NRP-2	Create blasting ordinance.	Seismic Disturbance	High	Planning	Local	Summer 2014	This action was completed in 2014.
Public Education and Awareness							
PEA-1	Educate residents about emergency alert procedures	All Hazards	Moderate	Village Administration	Local	2019	This action was completed.
PEA-2	Raise public awareness of natural hazards that could affect the area.	All Hazards	Moderate	Village Administration	Village Budget	2019	This action was completed.

Town of Mineral Springs Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Structural Projects							
SP-2	Add safeguards for CSX Railroad to prevent derailment near Mineral Springs Mill and Fertilizer.	Hazardous Substances	Moderate	Fire Department, Town Administration	Local	2019	Per Mineral Springs Fire & Rescue Department Chief Donald Gaddy, CSX has remediated any issues found with their tracks in downtown Mineral Springs.

City of Monroe Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-1	Develop drainage system maintenance procedures for cleaning and clearing debris from system and making repairs as required.	Flood	High	Engineering Department, Street Division	Local	2019	This action is complete.
P-2	Facilitate advanced training of building inspectors.	All Hazards	High	Planning and Development (Building Standards)	Local	2019	This action is complete.
P-5	On-site sediment retention > 12,000 square feet developed.	Flood	Moderate	Engineering	State grants	2019	This action is complete.
Natural Resource Protection							
NRP-2	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flood	Low	Planning and Development , Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2019	This action is complete.

Town of Stallings Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Natural Resource Protection							
NRP-1	Develop an Open Space/Greenway Plan that integrates flood mitigation strategies with open space management techniques.	Flood	Low	Planning, Parks and Recreation	Local, NCDENR, NCDOT, The Conservation Fund	2019	Complete. Connect Stallings Greenway & Recreation Master Plan adopted by Council. Contract for engineering associated with Phase I design executed.

Town of Unionville Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Public Education and Awareness							
PEA-2	Raise public awareness of natural hazards that could affect the area.	All Hazards	Moderate	Town Administration	Town Budget	2019	This action has been completed. Preparedness links on Town website.

Town of Wingate Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-3	Require sprinkler systems in older structures.	Wildfire	Moderate	Waxhaw Board of Commissioners	Local	2015	This action has been deleted.
P-4	Carry out Phase II stream cleanup.	Flood	Low	Waxhaw Board of Commissioners	FEMA	2015	This action has been deleted.
Property Protection							
PP-1	Acquire safe sites for public facilities.	All Hazards	Moderate -High	Waxhaw Board of Commissioners	Local	2019	This action has been completed.
Emergency Services							
ES-3	Renovate fire hydrant system in downtown.	Wildfire	Moderate	Waxhaw Board of Commissioners	General Budget	2015	This action has been completed.

Town of Weddington Completed Mitigation Actions

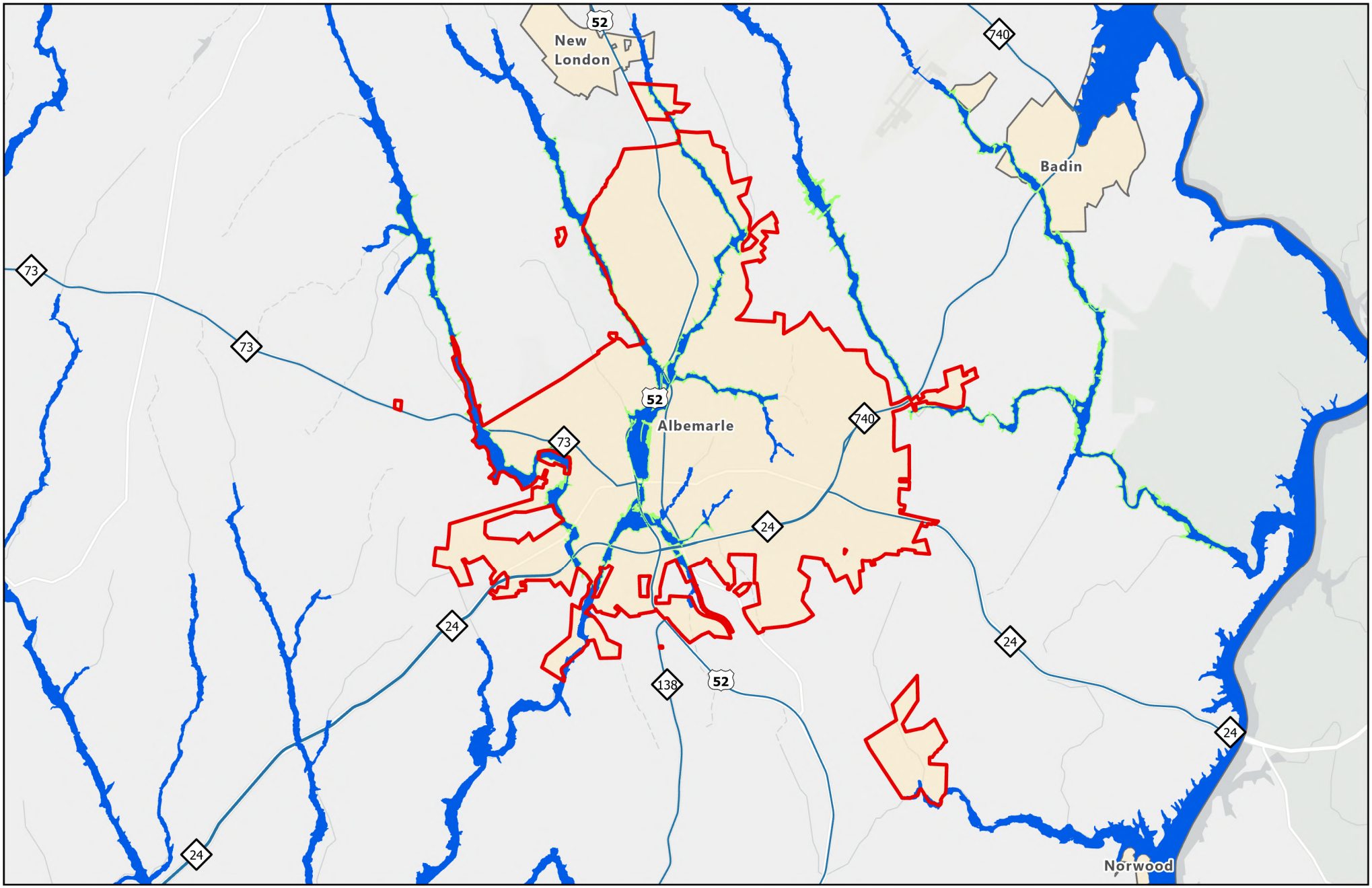
Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Emergency Services							
ES-2	Assisted in upgrading Providence VFD to code for overnight facilities to help with fire coverage/response times.	All Hazards	High/ Moderate	Town Administration	Local Fund Balance	Apr-14	This action has been deleted.

Town of Wingate Completed Mitigation Actions

Action #	Description	Hazard(s) Addressed	Relative Priority	Lead Agency/ Department	Potential Funding Sources	Implementation Schedule	Implementation Status (2020)
Prevention							
P-7	Designate a local floodplain manager that achieves CFM certification	Flood	Moderate	Planning	General Funds	2019	This action is complete
Structural Projects							
SP-2	TV sewer mains and either make local point repairs, or line pipe using CIPP.	Flood	High	Public Works	Water/Sewer	2019	This action is complete.

Appendix F
Flood Hazard Maps

Albemarle - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

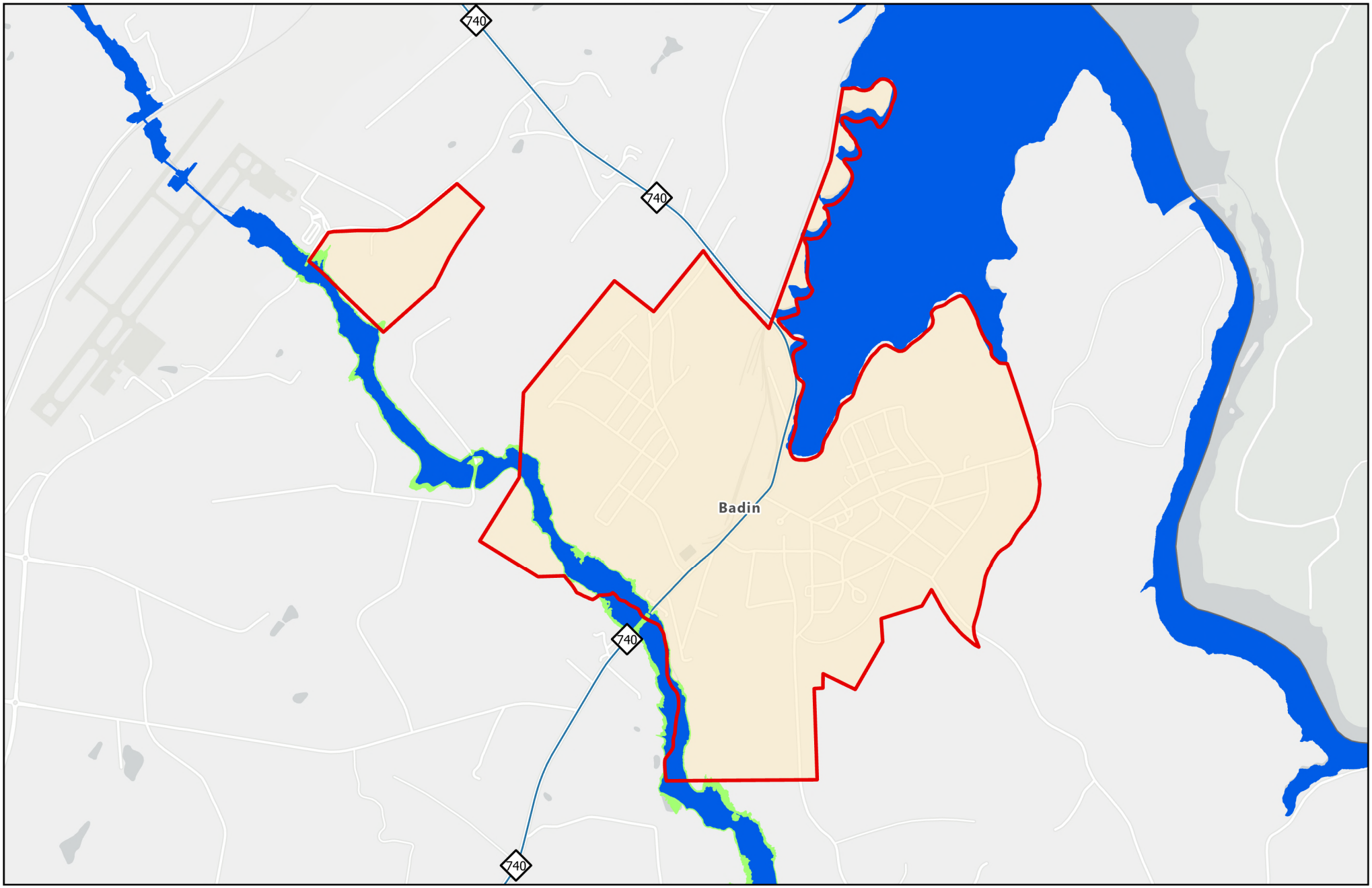
0 1 2 4 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

N

798

Badin - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

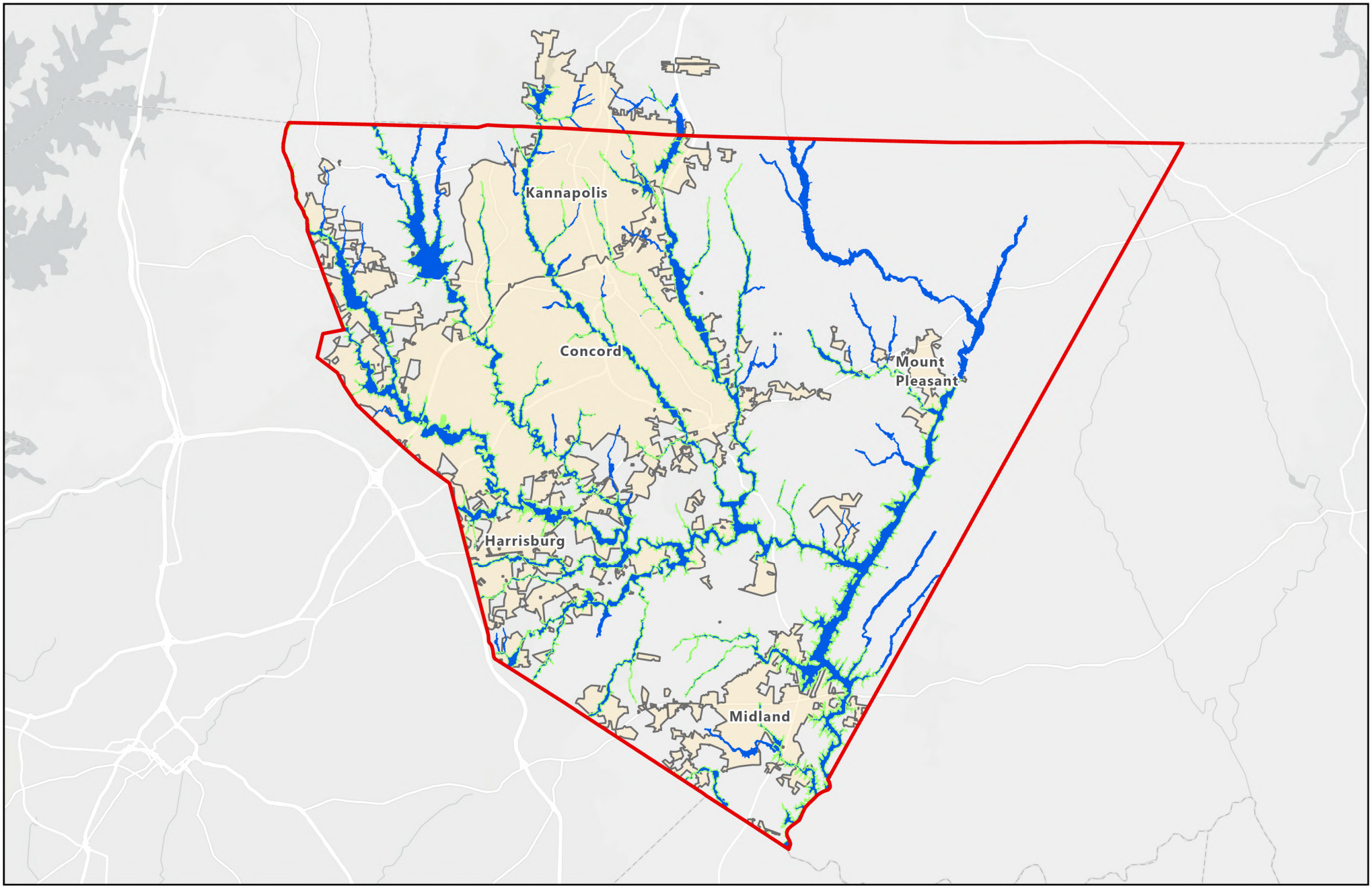
0 0.3 0.6 1.2 Miles

N

799

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

Cabarrus County - Flood Hazard Areas



Legend

- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

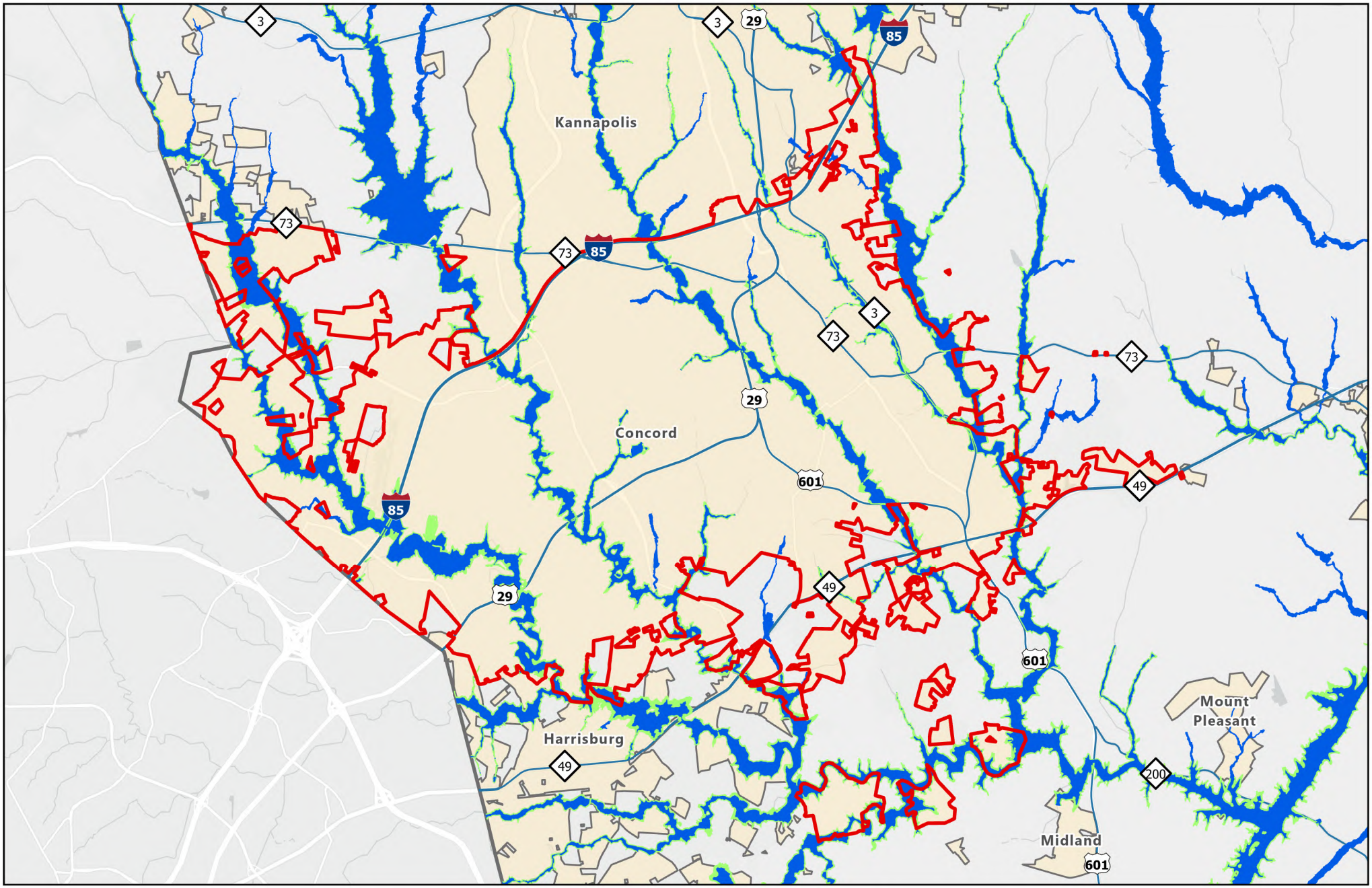
0 3 6 12 Miles

N

800

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37025C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 9/19/2024

Concord - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

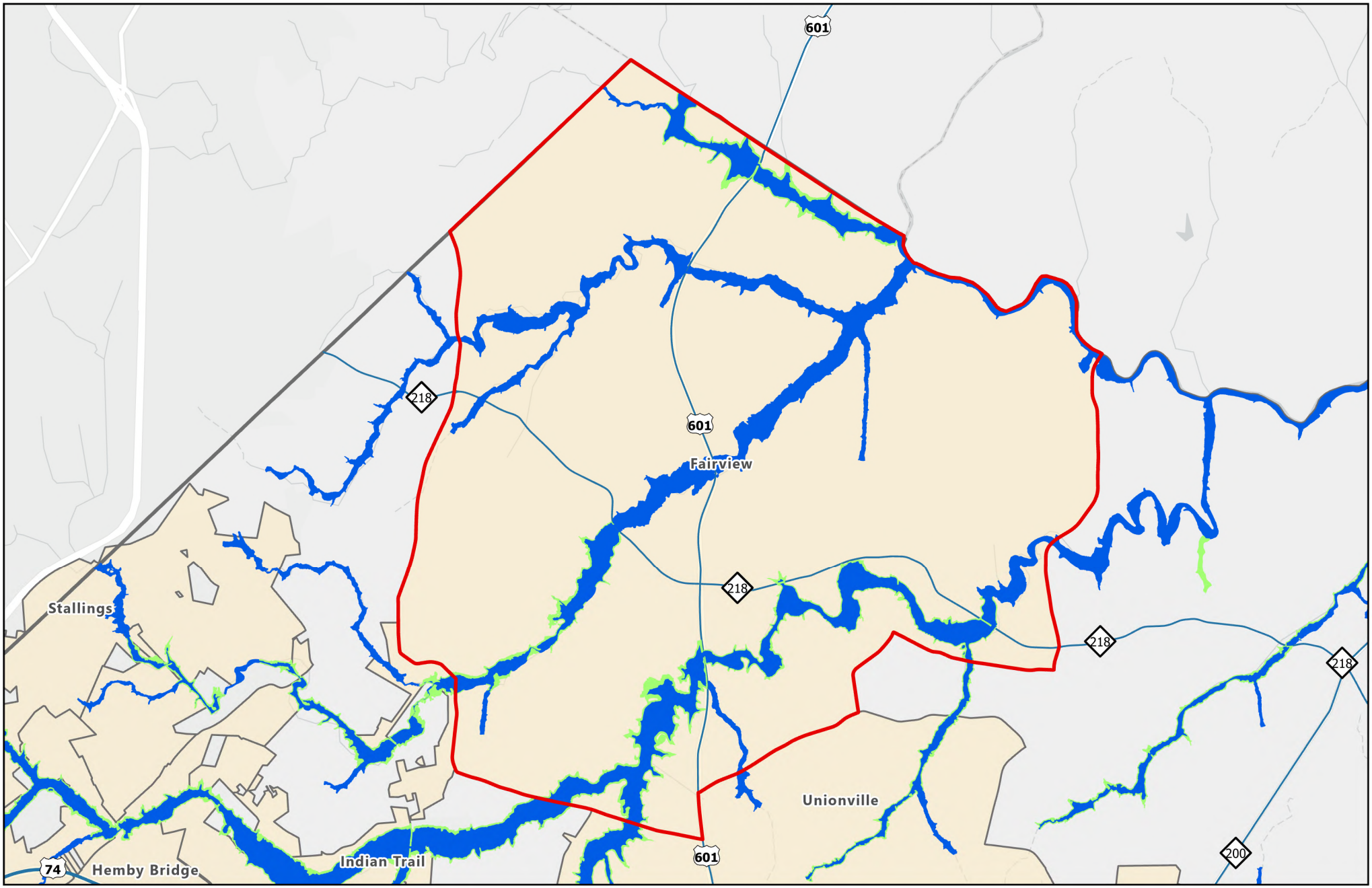
0 1.5 3 6 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37025C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 9/19/2024

N

801

Fairview - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

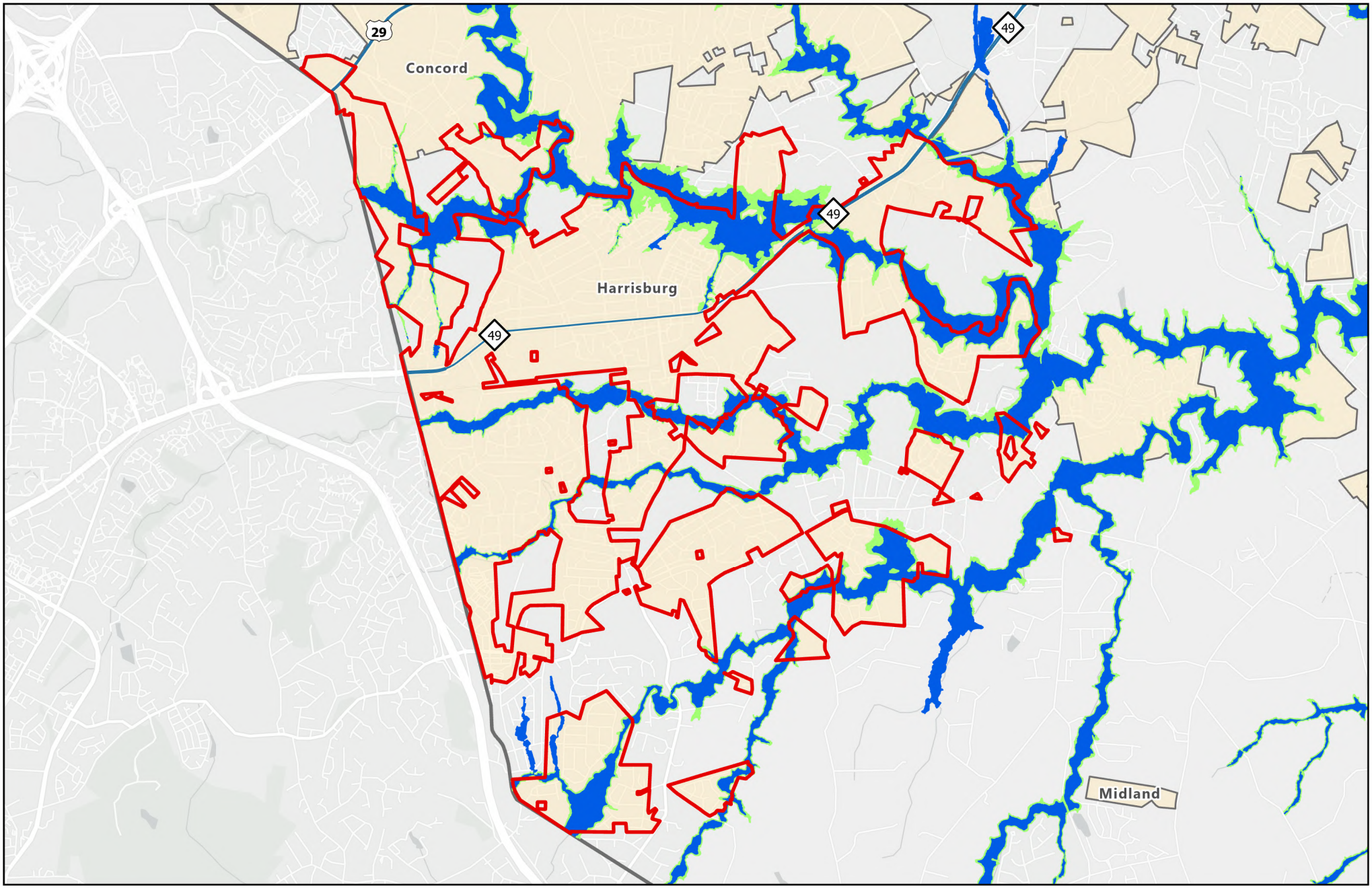
0 0.75 1.5 3 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

802

Harrisburg - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

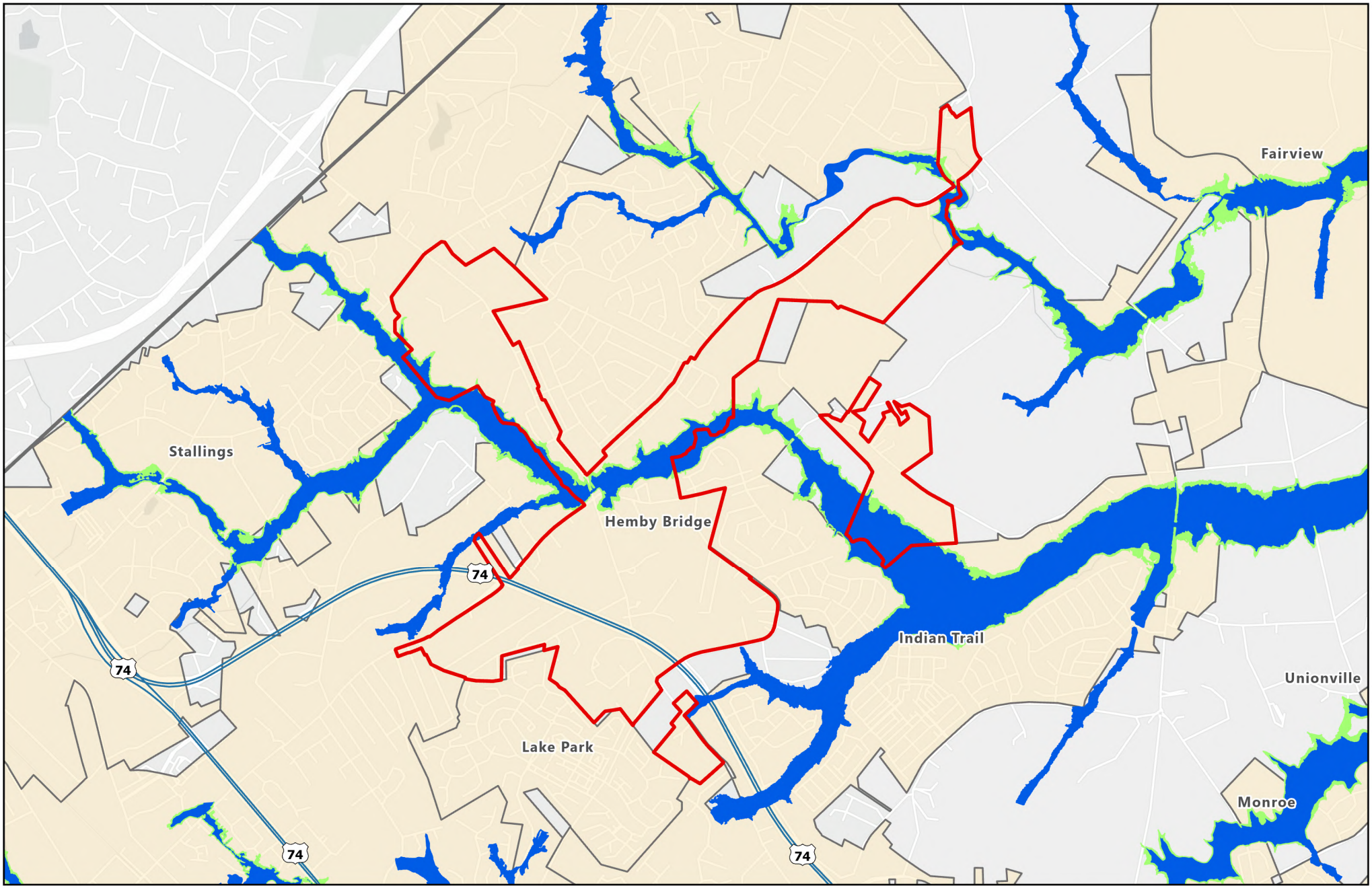
0 0.75 1.5 3 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37025C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 9/19/2024

N

803

Hemby Bridge - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

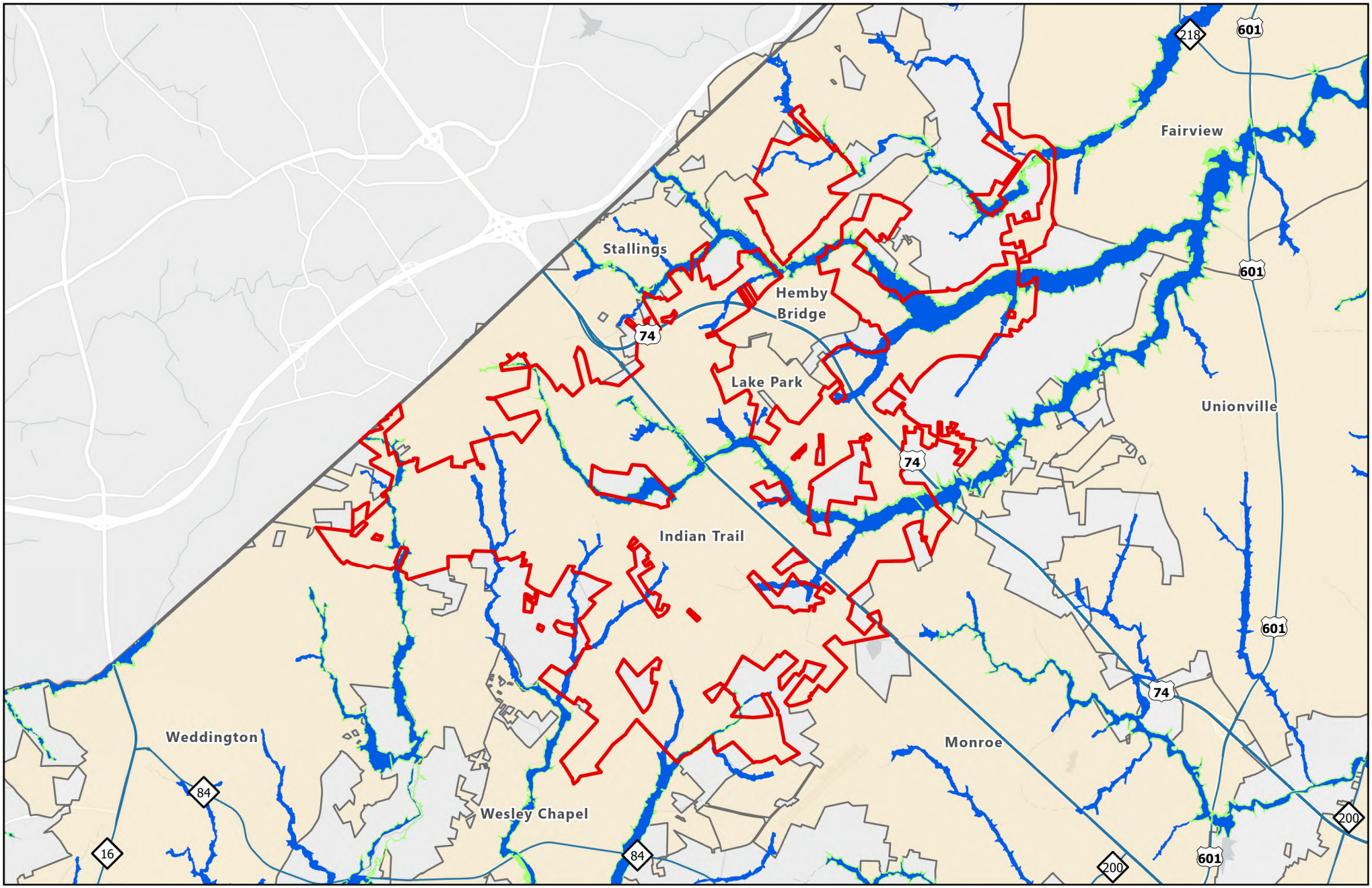
0 0.45 0.9 1.8 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

804

Indian Trail - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

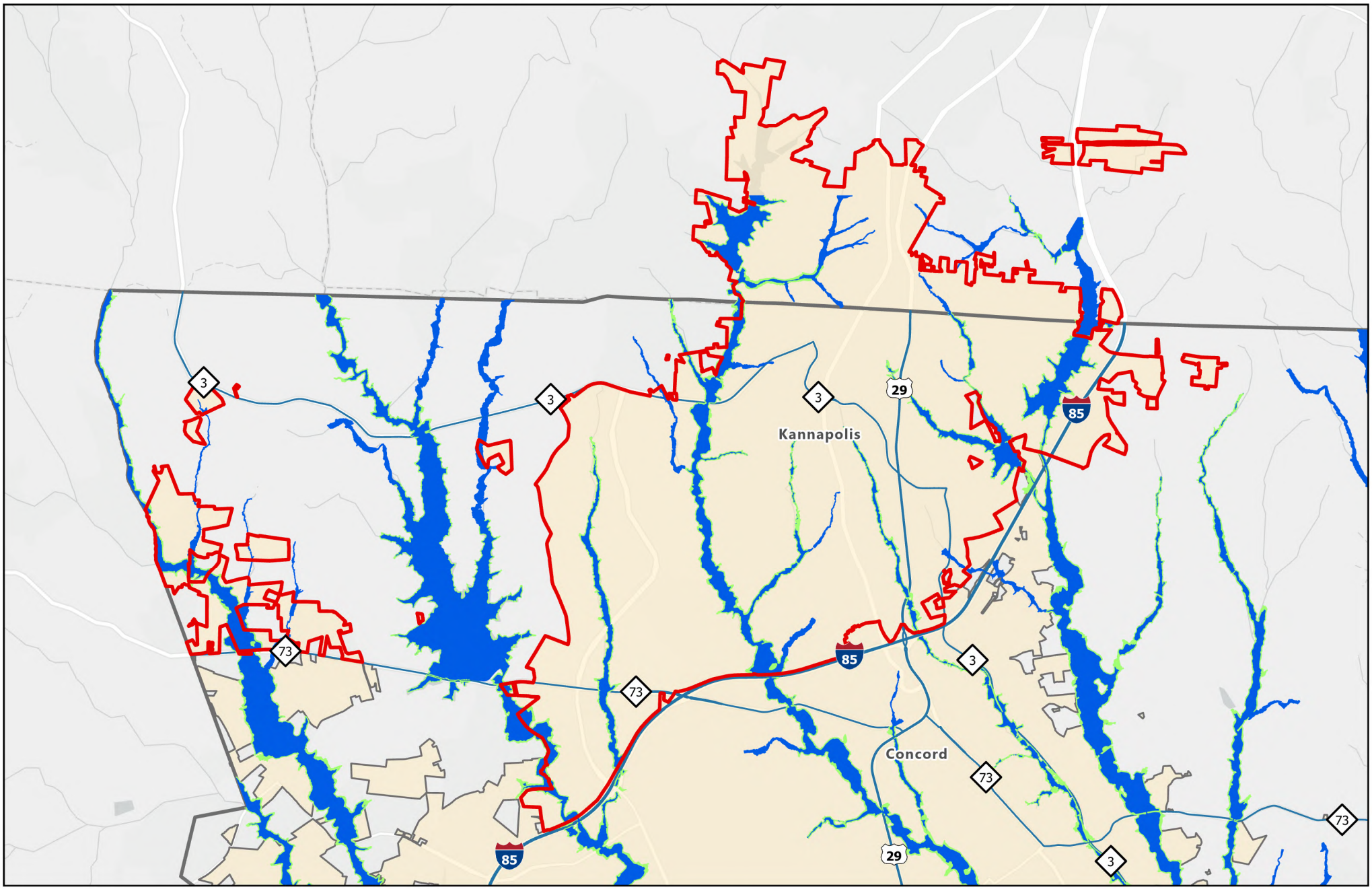
0 1 2 4 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

805

Kannapolis - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

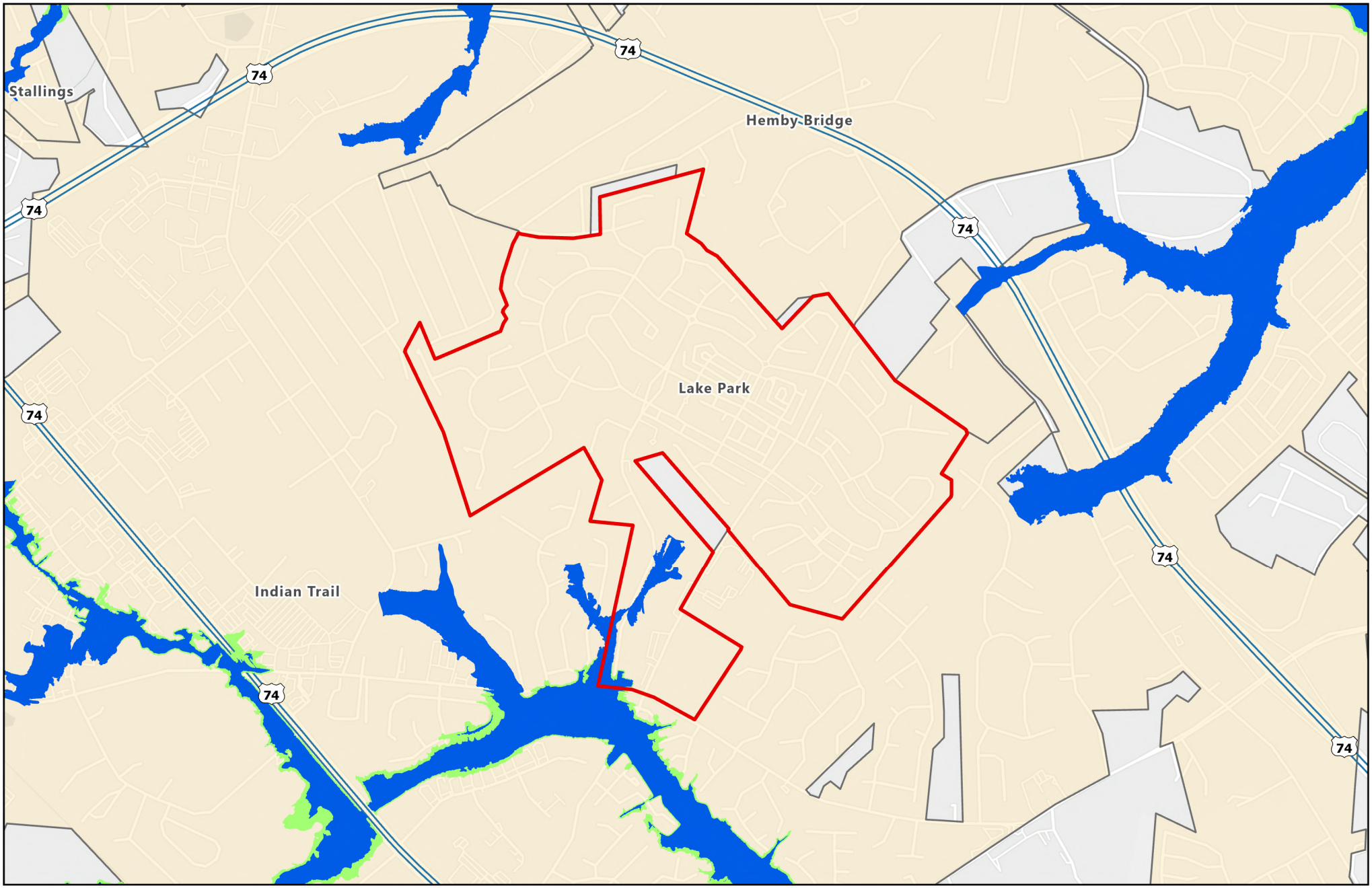
0 1.25 2.5 5 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37025C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 9/19/2024

N

806

Lake Park - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

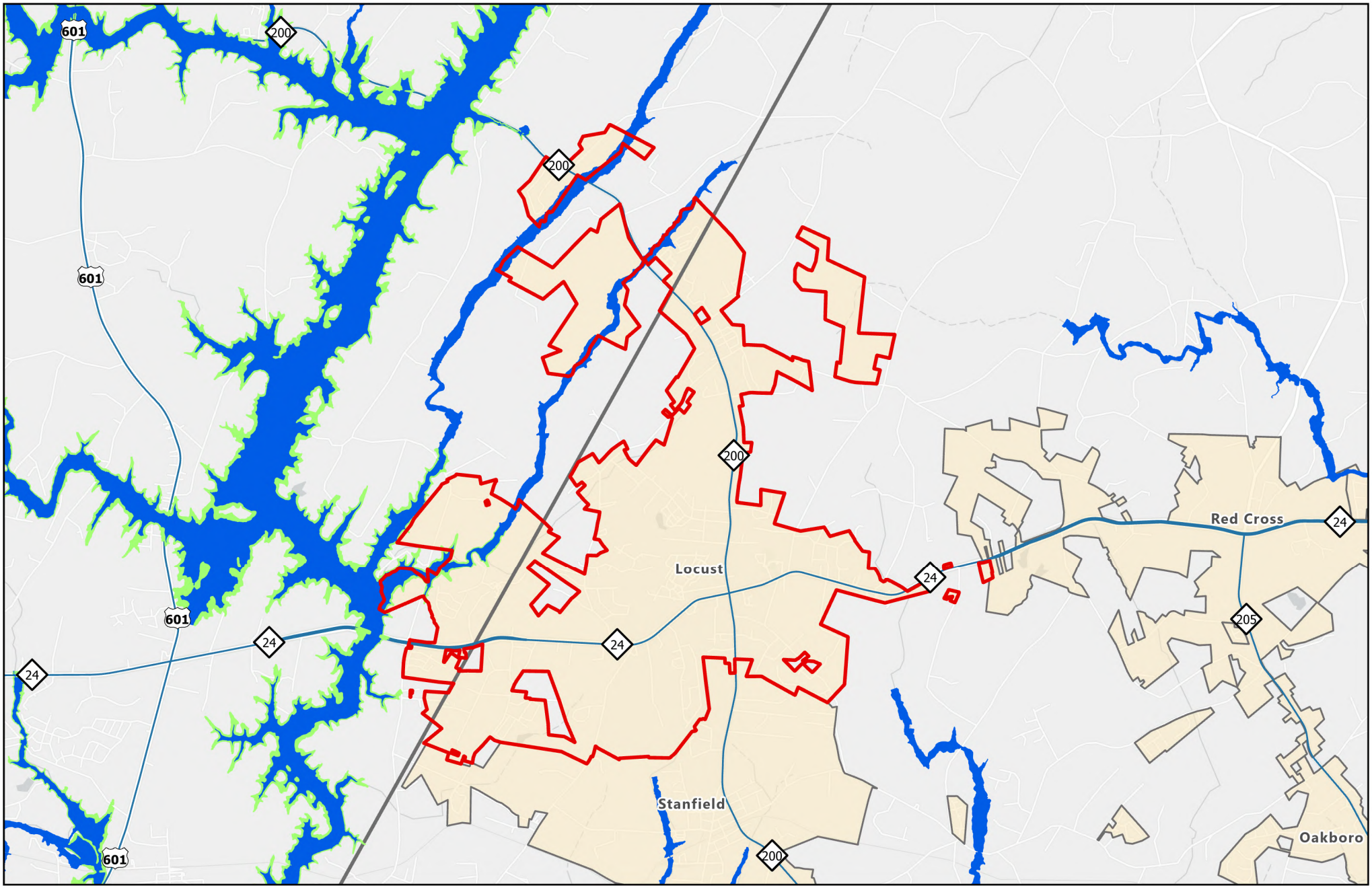
0 0.23 0.45 0.9 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

807

Locust - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

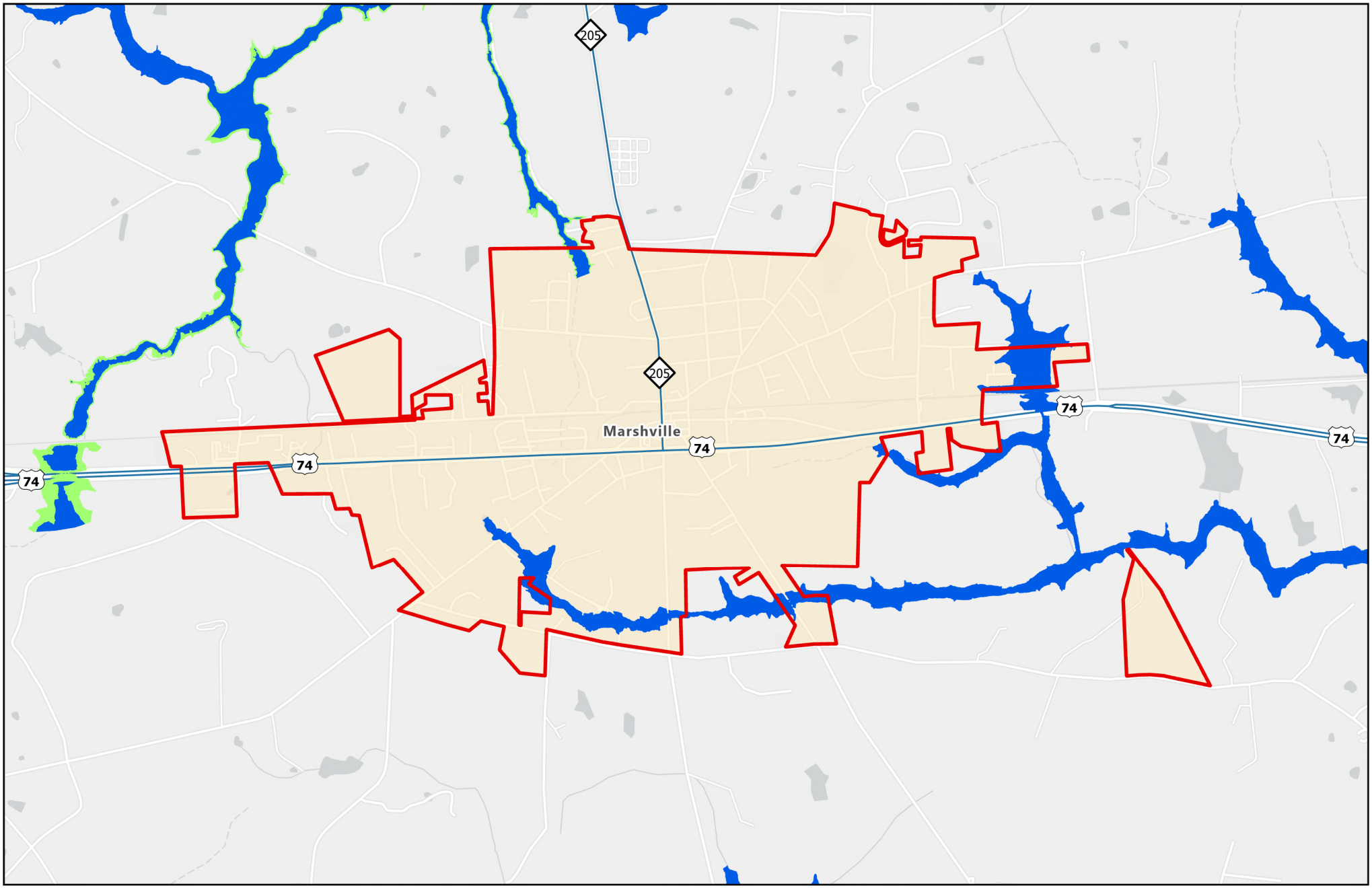
0 0.75 1.5 3 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

N

808

Marshville - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

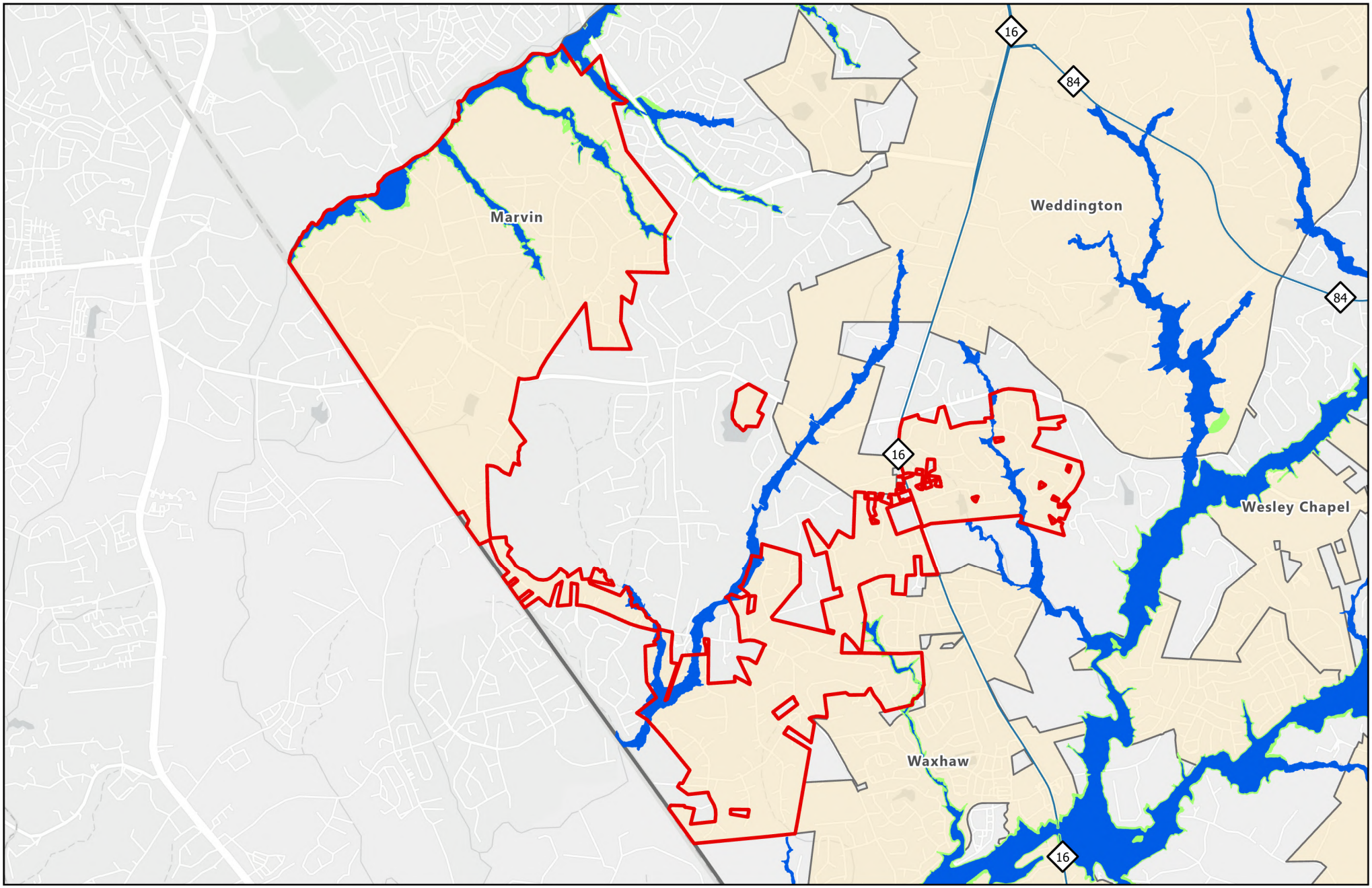
0 0.3 0.6 1.2 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

809

Marvin - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

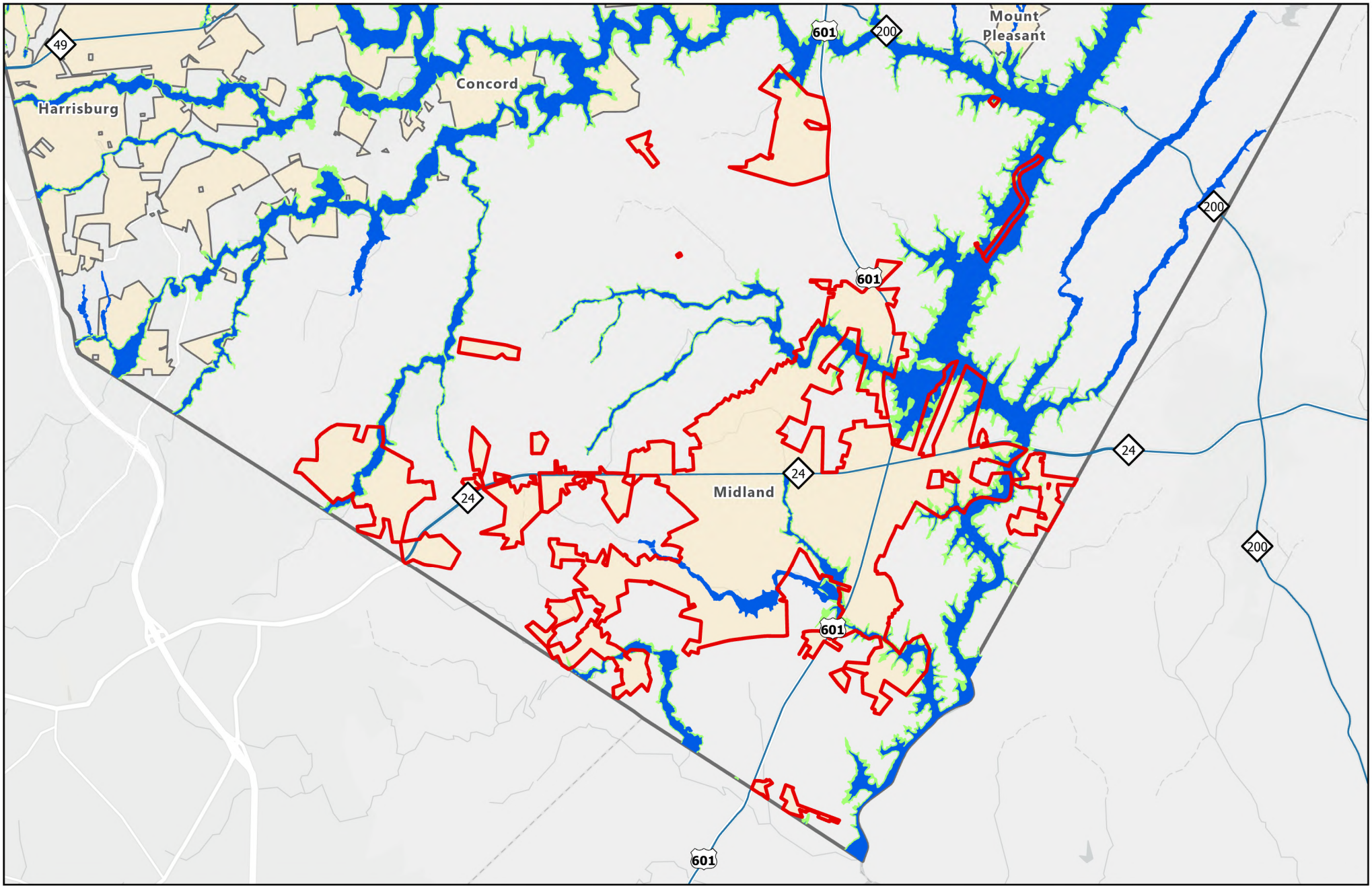
0 0.5 1 2 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

810

Midland - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

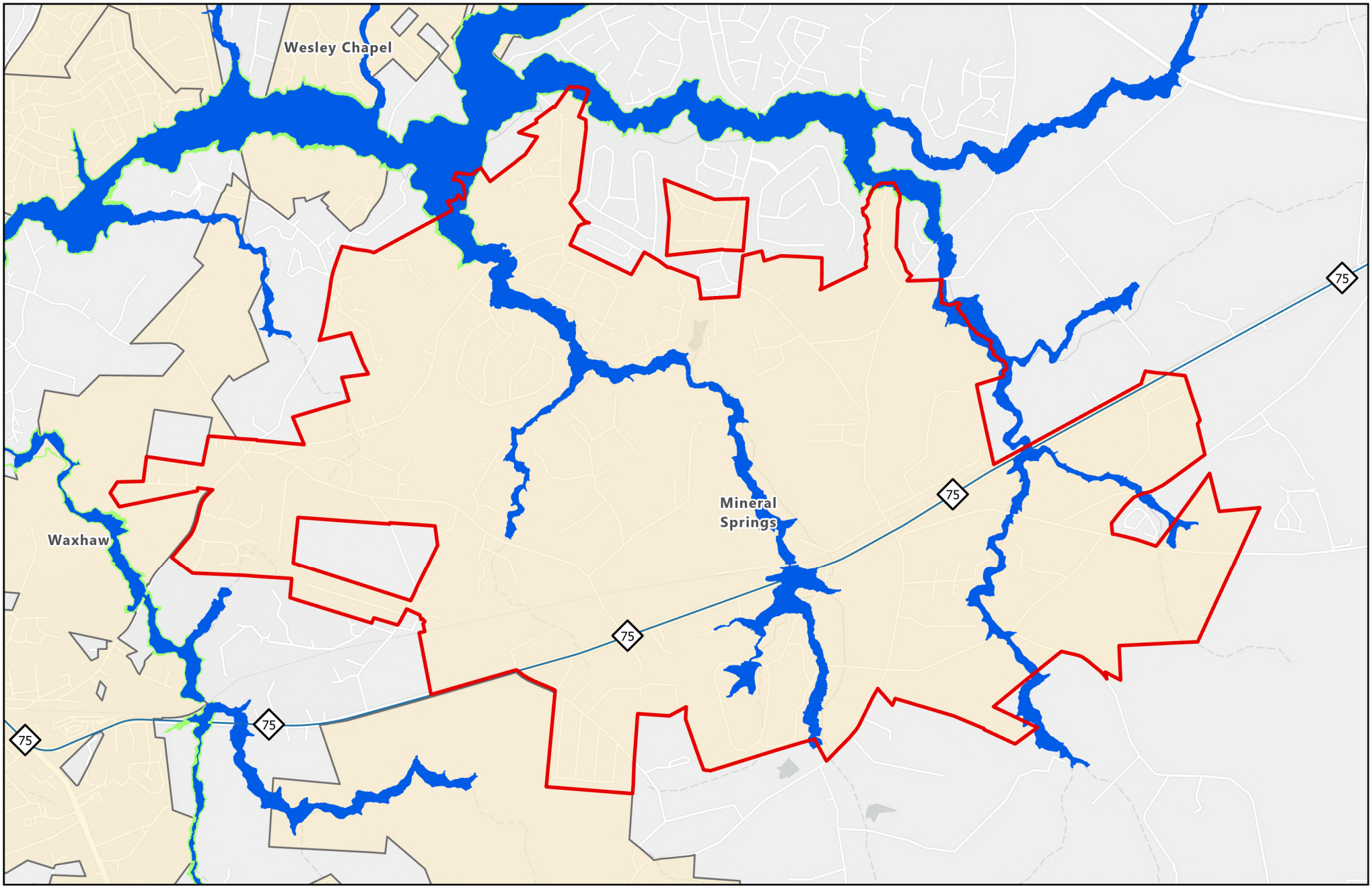
0 1 2 4 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37025C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 9/19/2024

N

811

Mineral Springs - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

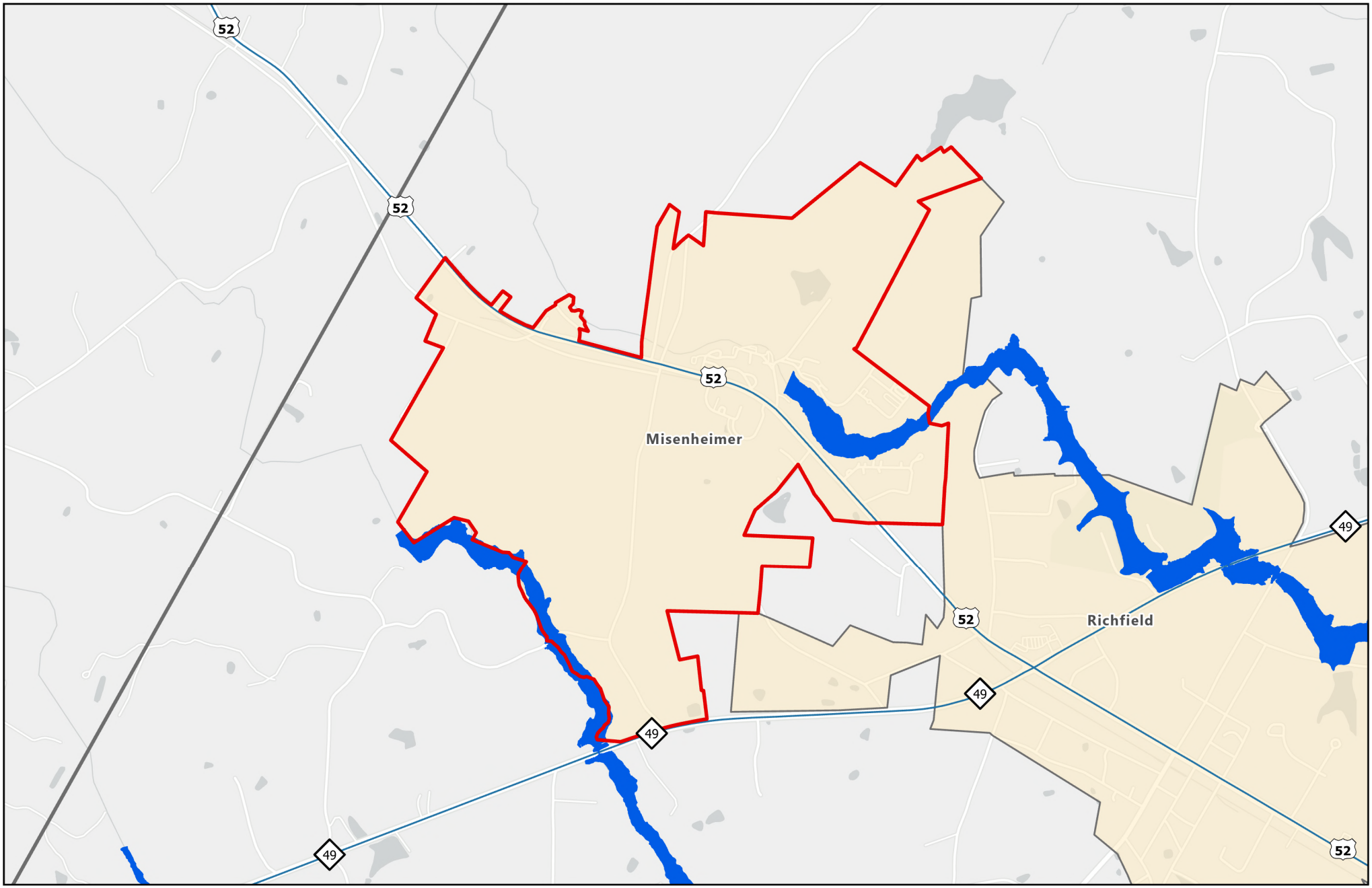
0 0.45 0.9 1.8 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

812

Misenheimer - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

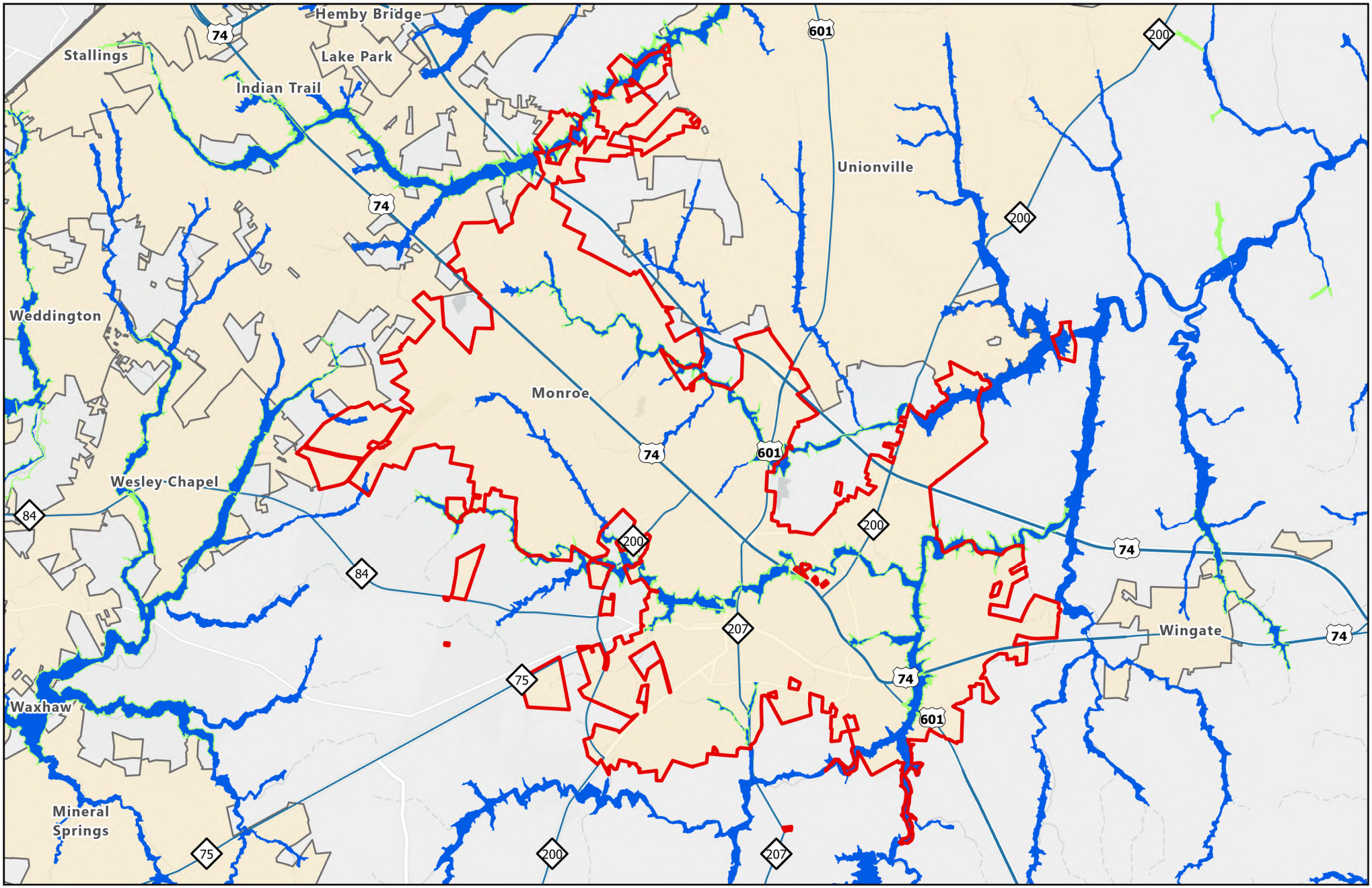
0 0.3 0.6 1.2 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

N

813

Monroe - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

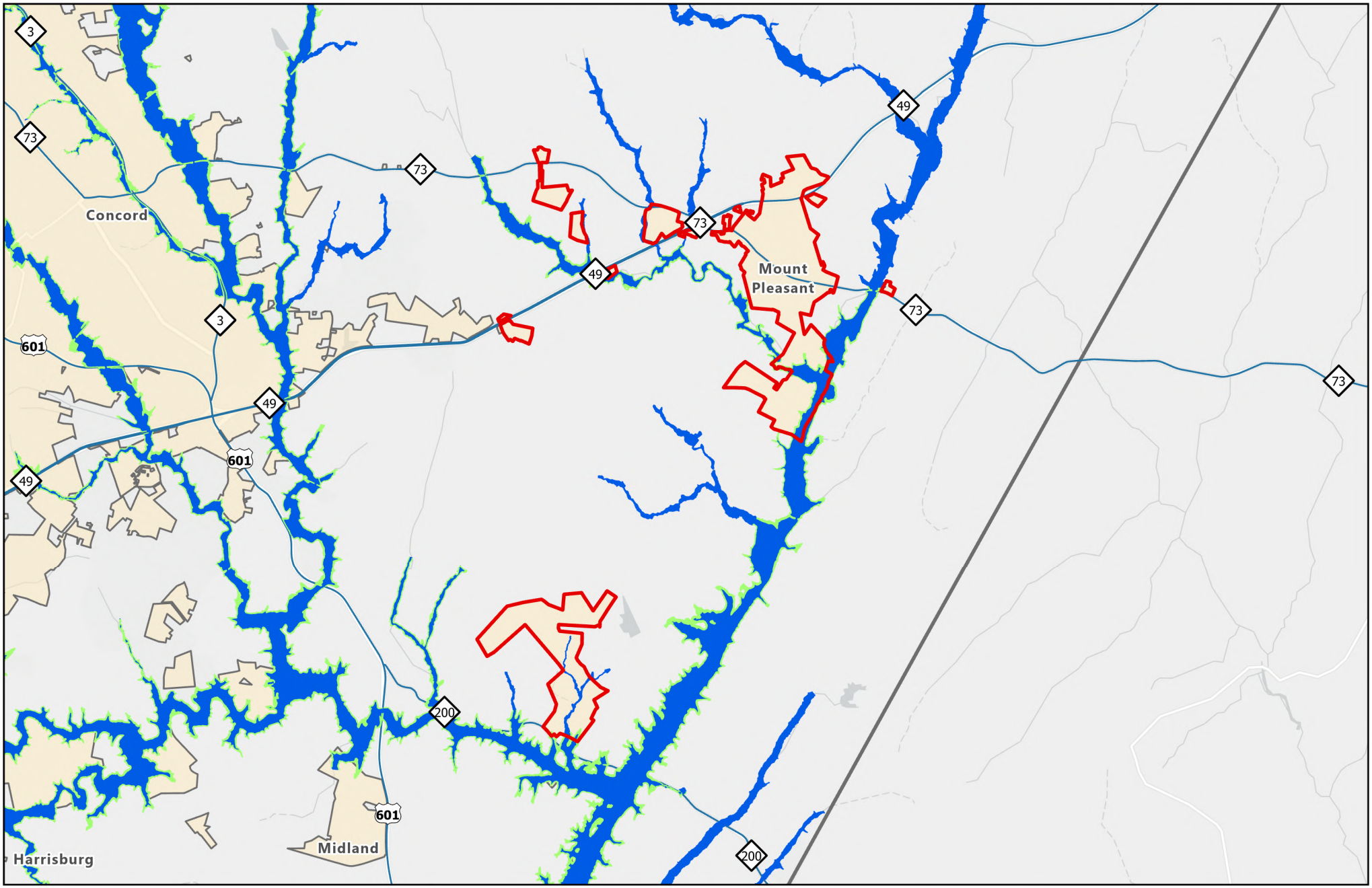
0 1.25 2.5 5 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

814

Mount Pleasant - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

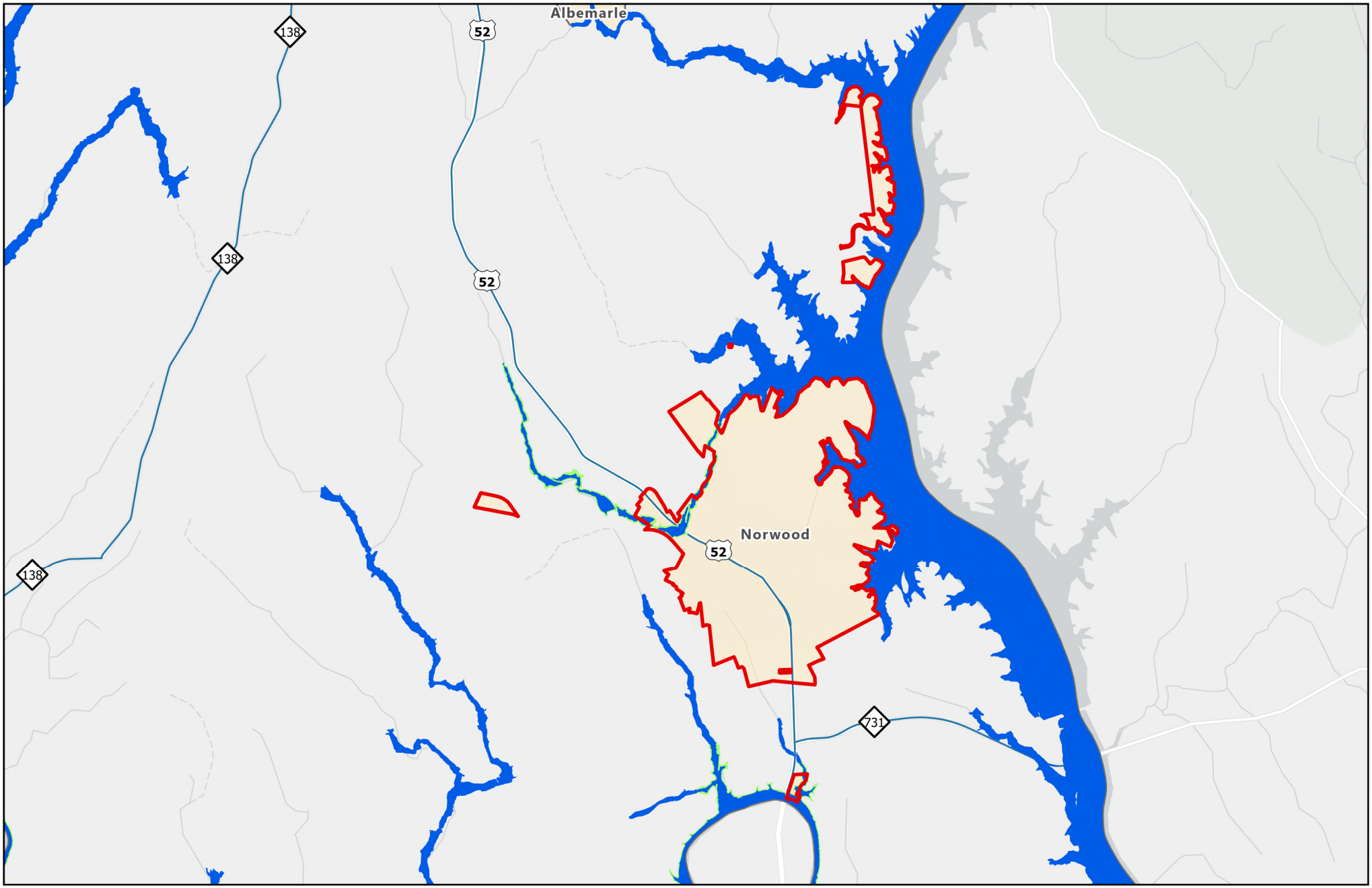
0 1 2 4 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37025C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 9/19/2024

N

815

Norwood - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

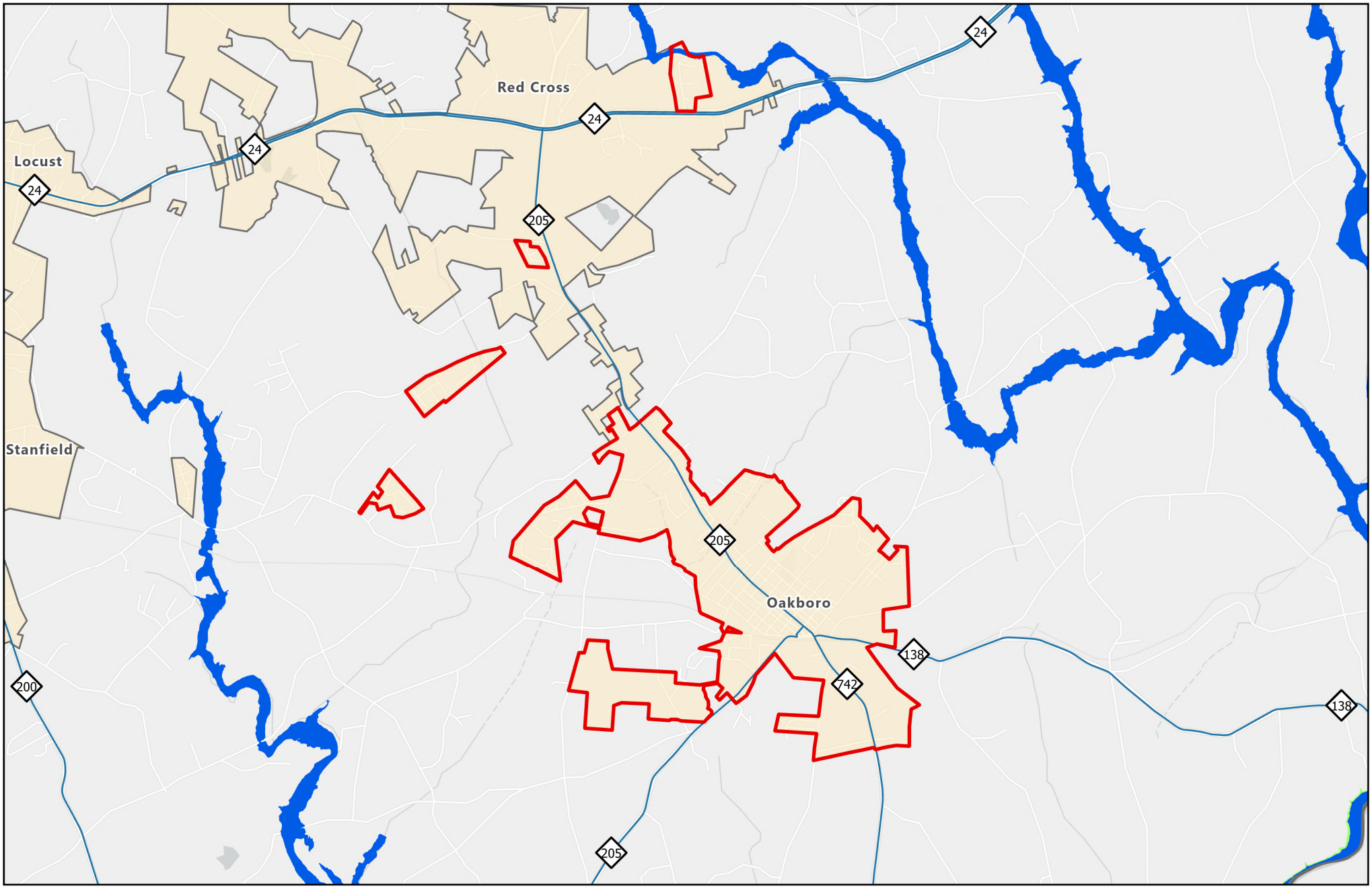
0 0.75 1.5 3 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

N

816

Oakboro - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

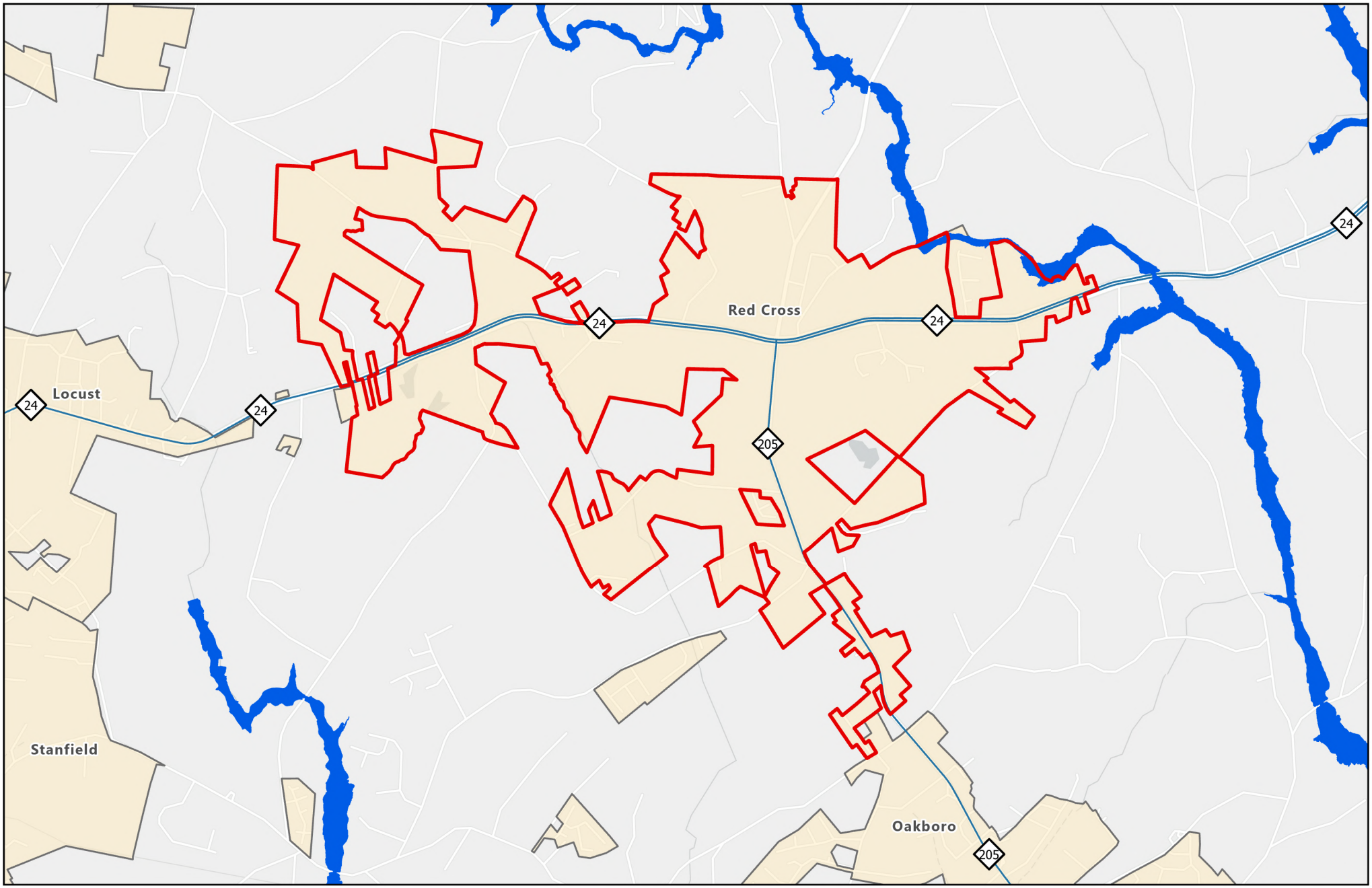
0 0.5 1 2 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

N

817

Red Cross - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

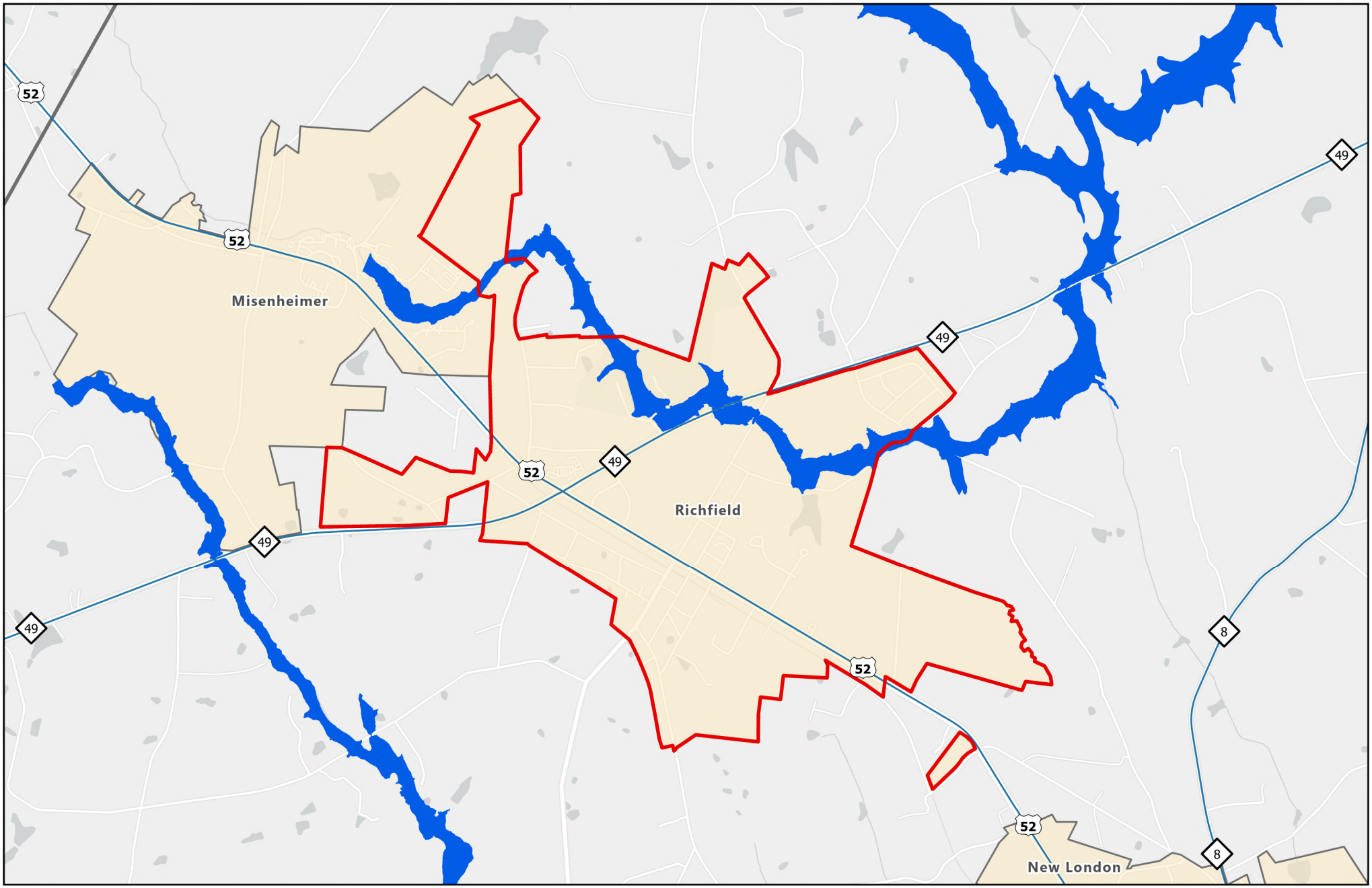
0 0.45 0.9 1.8 Miles

N

818

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

Richfield - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

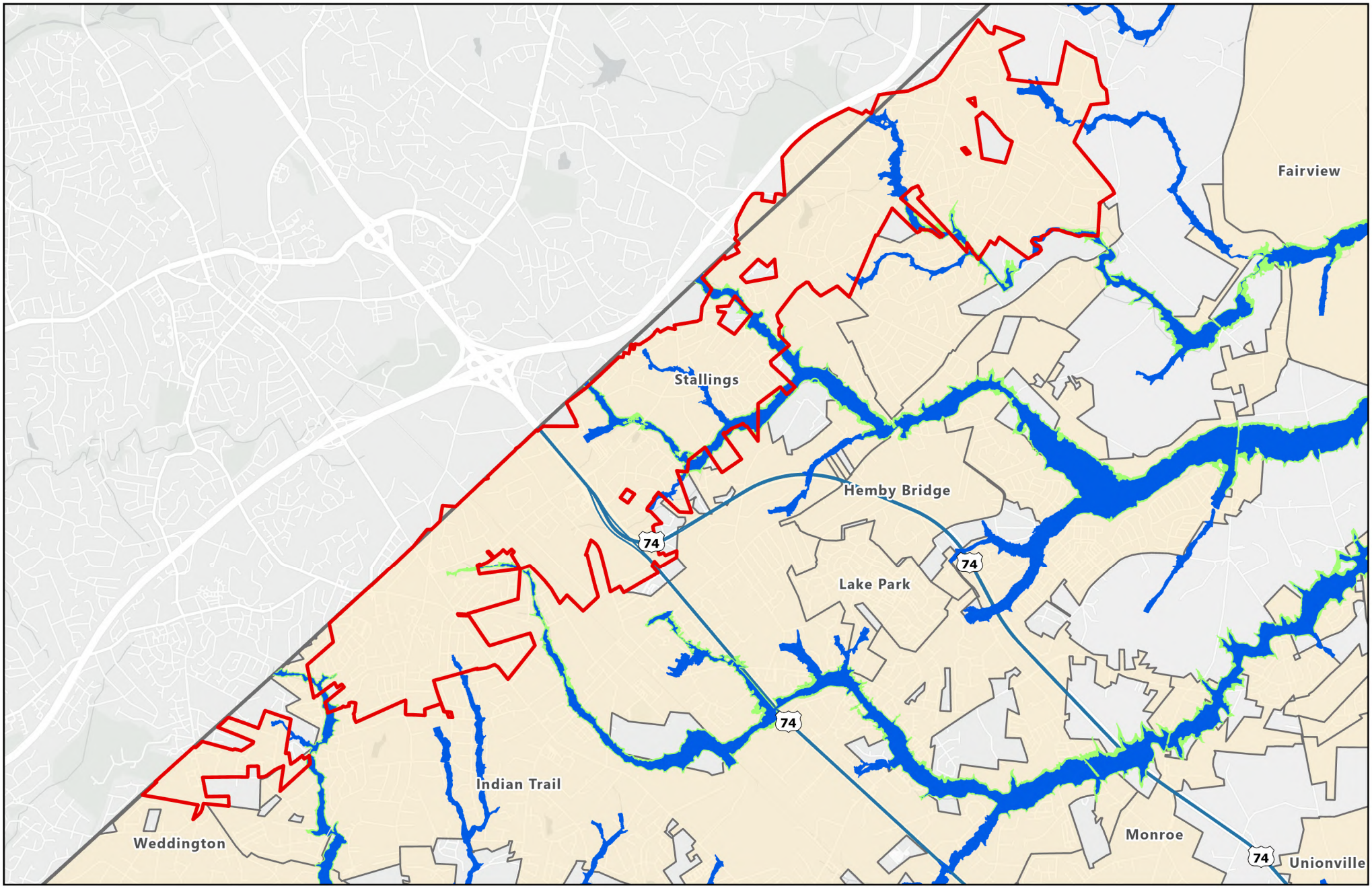
0 0.38 0.75 1.5 Miles

N

819

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

Stallings - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

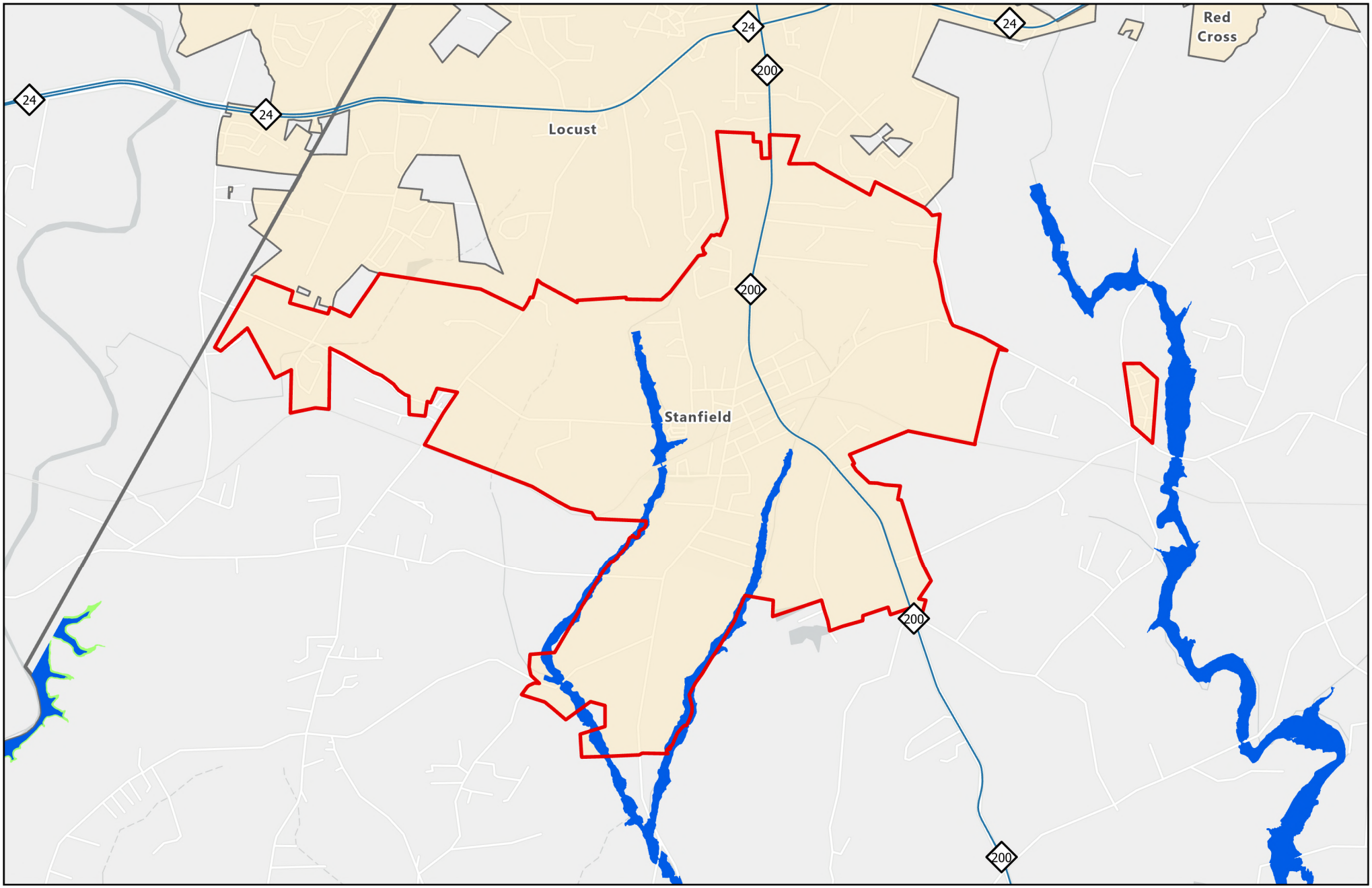
0 0.75 1.5 3 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

820

Stanfield - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

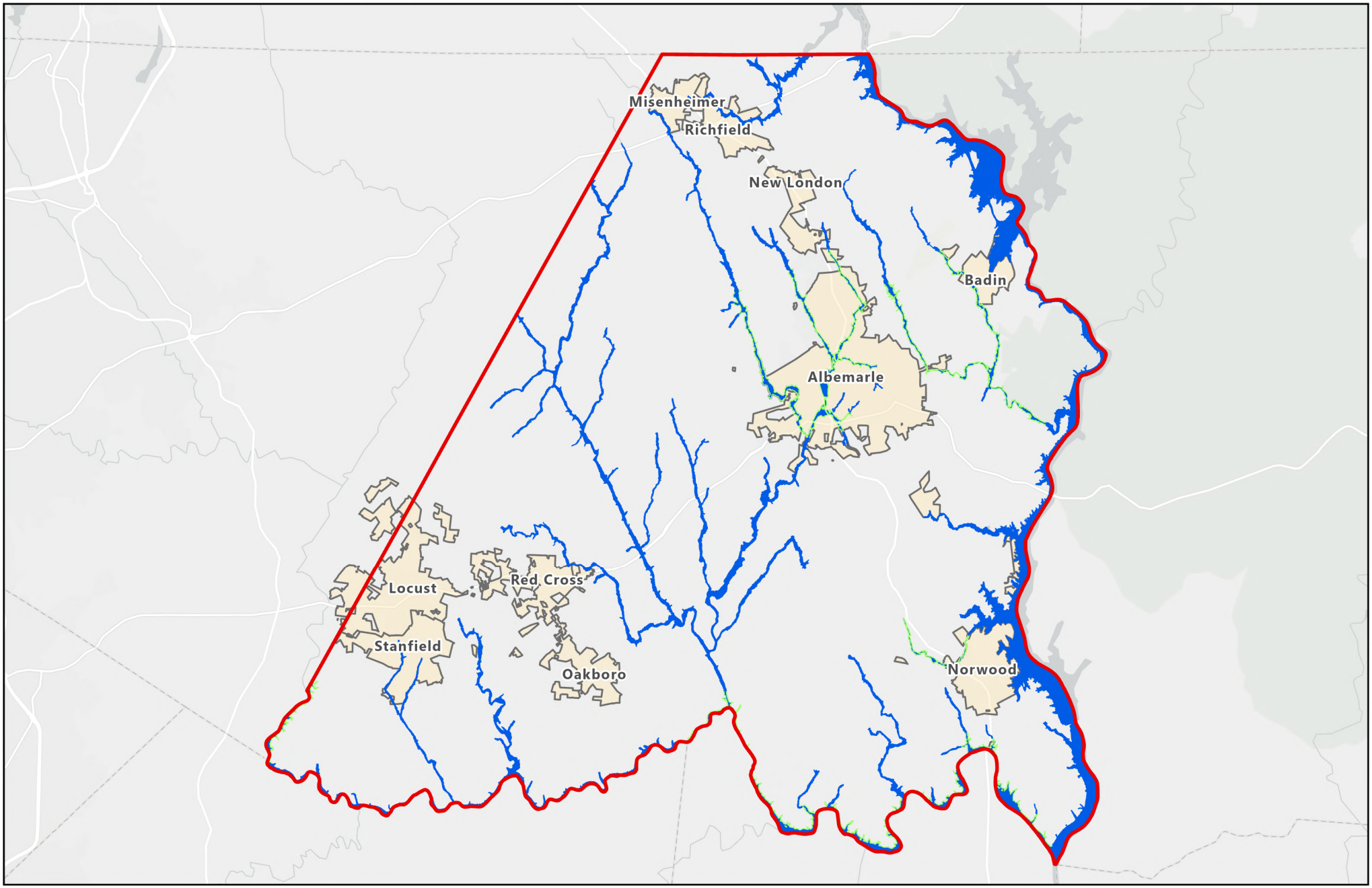
0 0.45 0.9 1.8 Miles

N

821

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

Stanly County - Flood Hazard Areas



Legend

- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

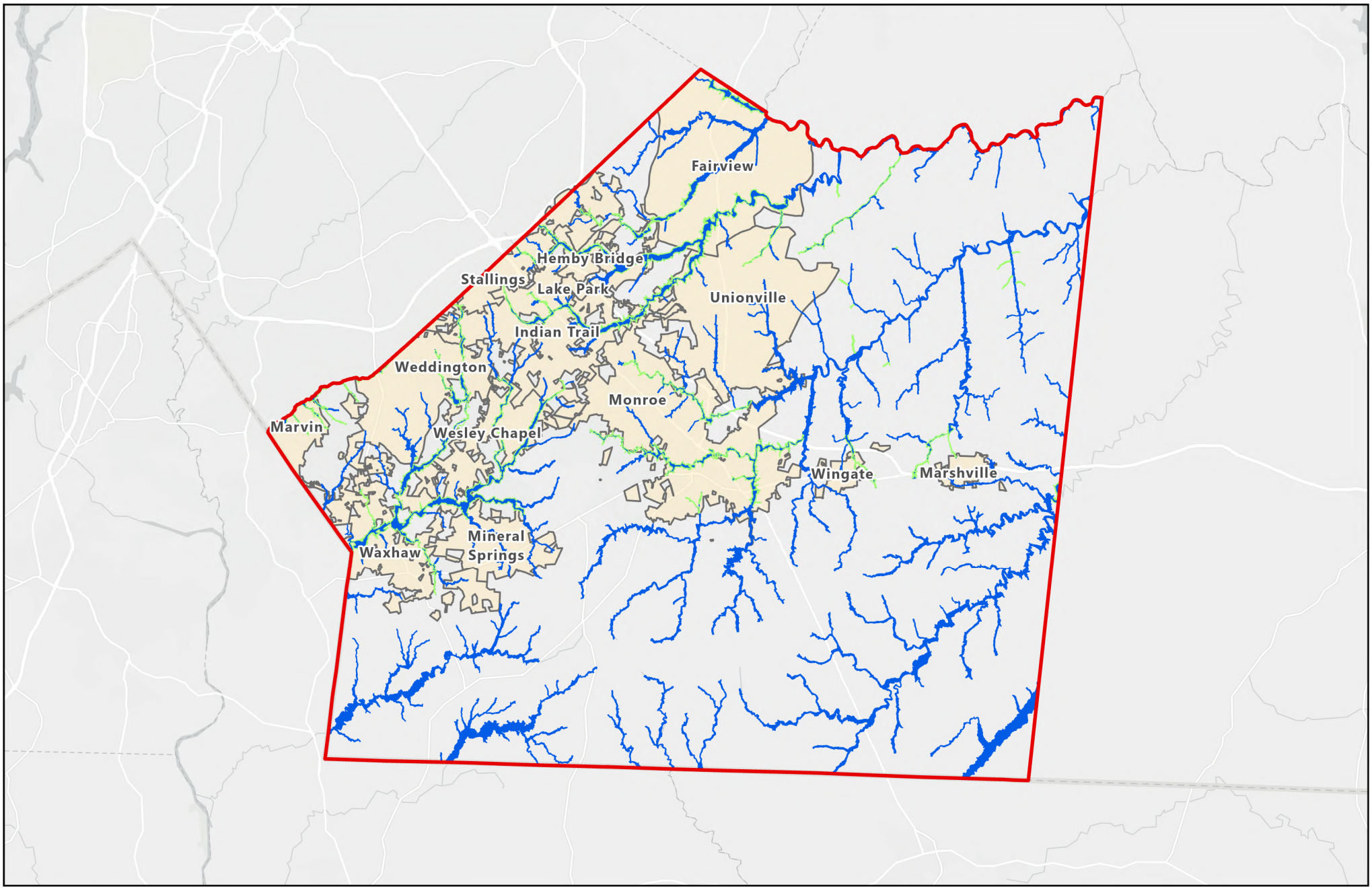
0 3 6 12 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37167C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 5/29/2024

N

822

Union County - Flood Hazard Areas



Legend

- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

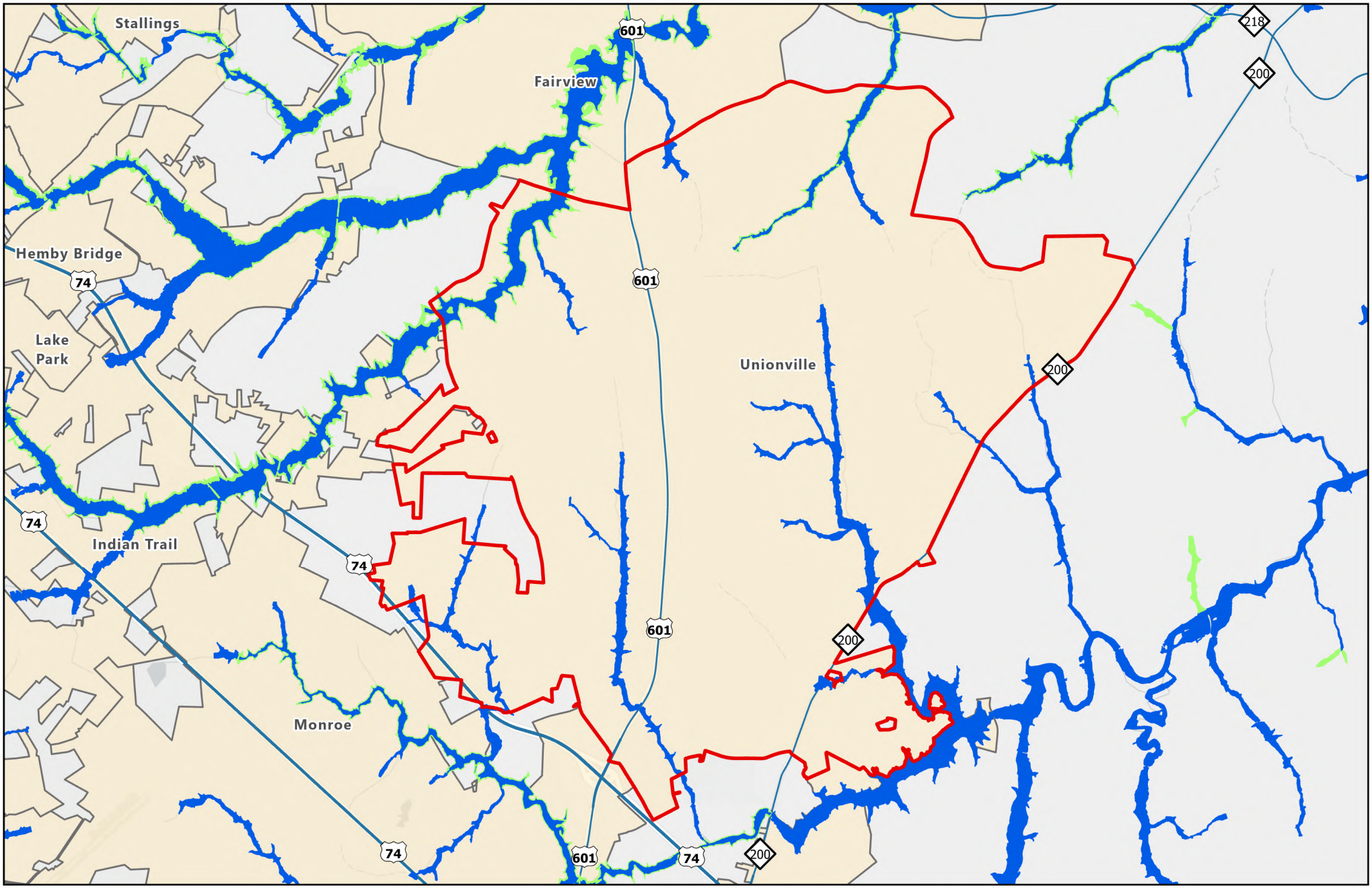
0 3.75 7.5 15 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

823

Unionville - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

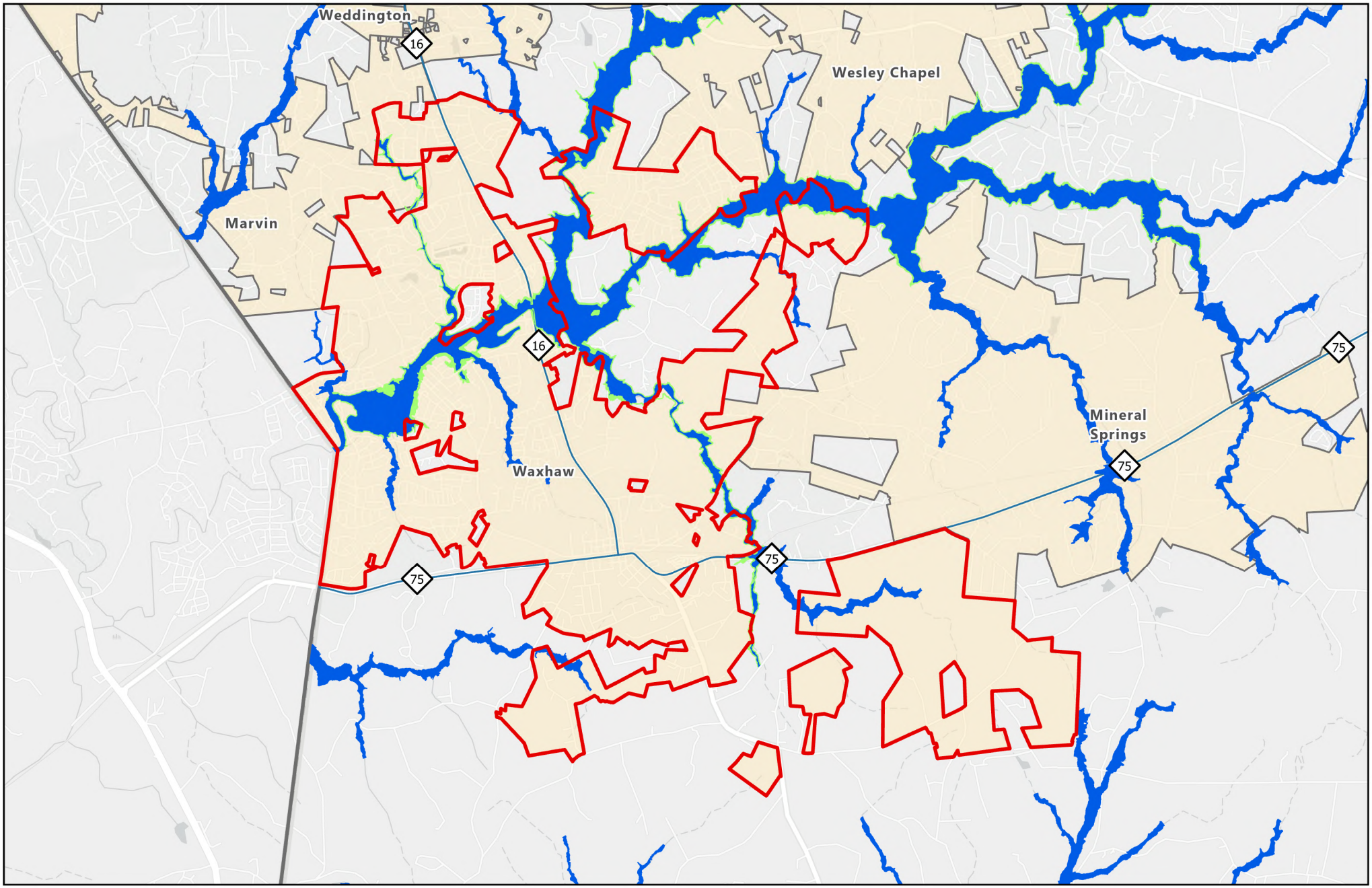
0 0.75 1.5 3 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

824

Waxhaw - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

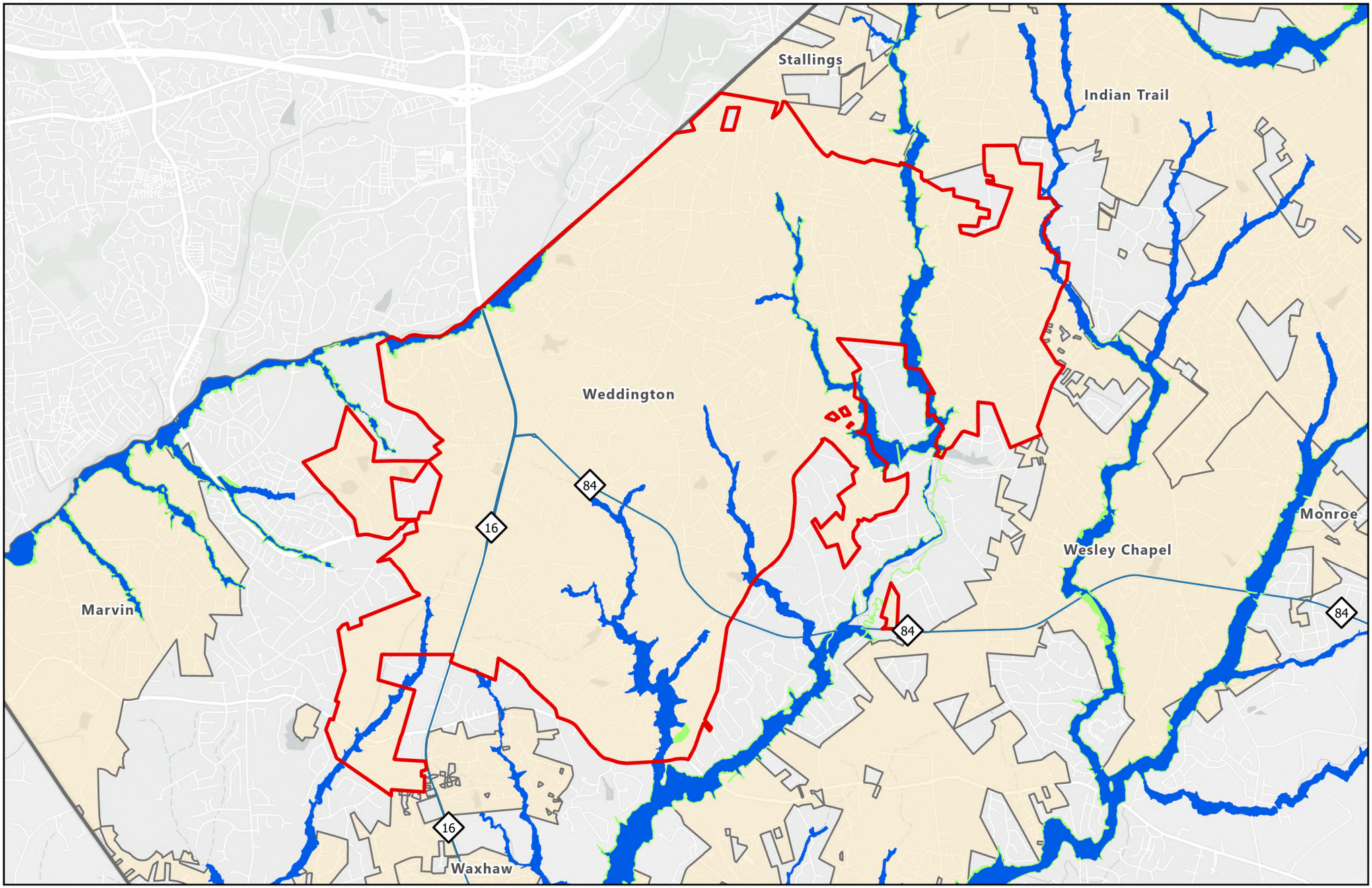
0 0.75 1.5 3 Miles

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

825

Weddington - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

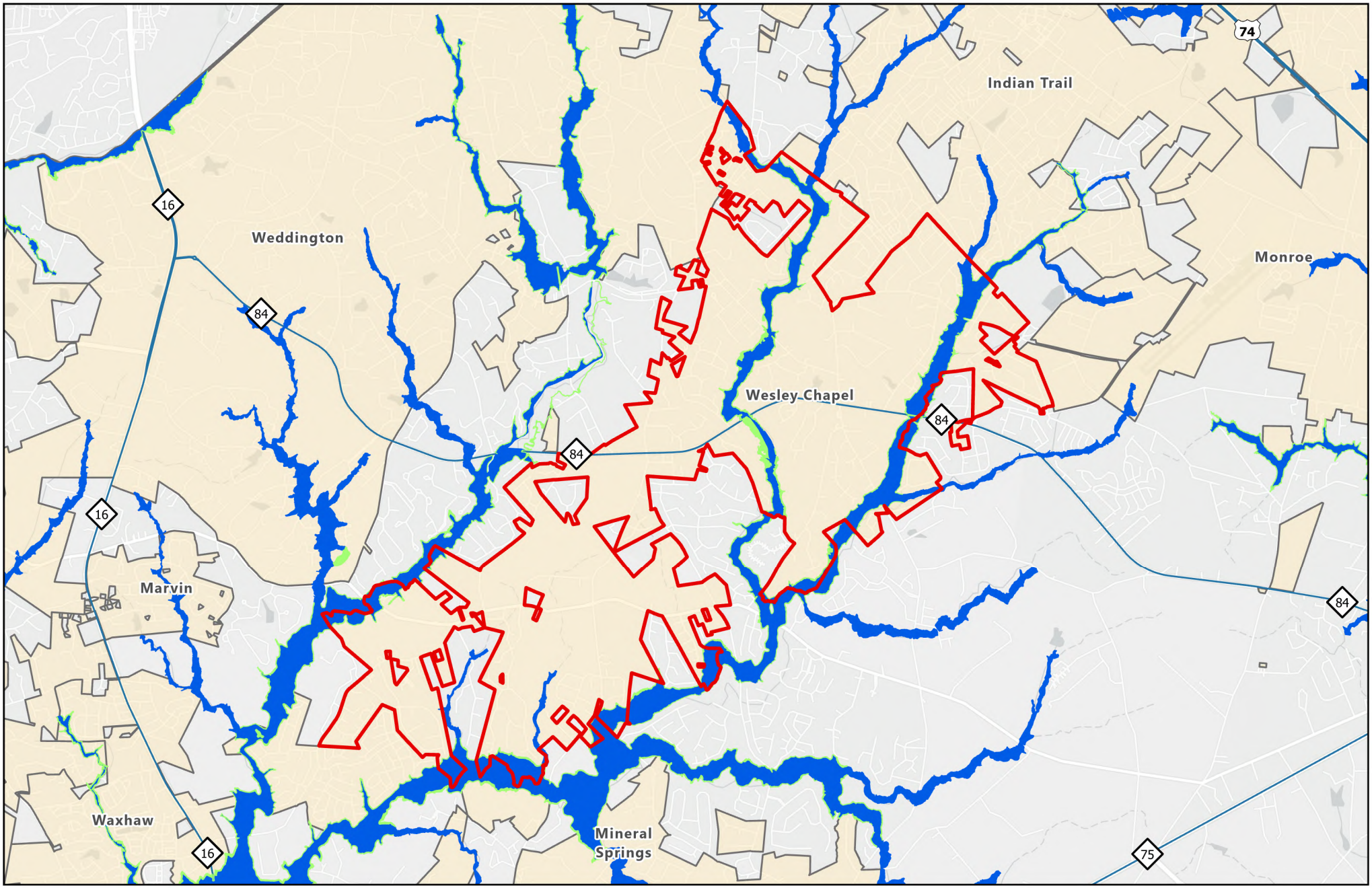
0 0.75 1.5 3 Miles

N

826

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

Wesley Chapel - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

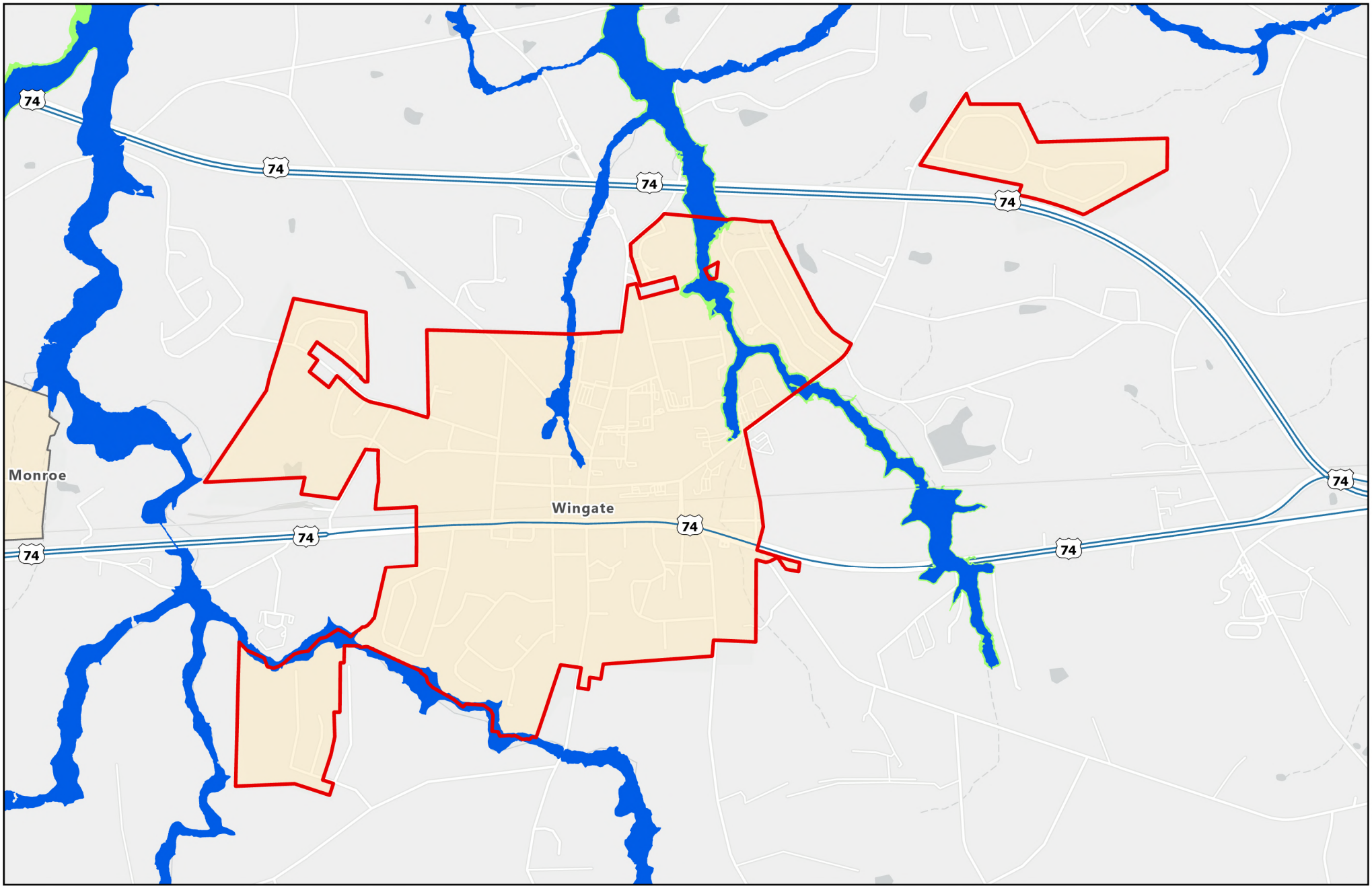
0 0.75 1.5 3 Miles

N

827

Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

Wingate - Flood Hazard Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

Flood Zone

- 500-Year Flood Zone
- 100-Year Flood Zone

0 0.3 0.6 1.2 Miles

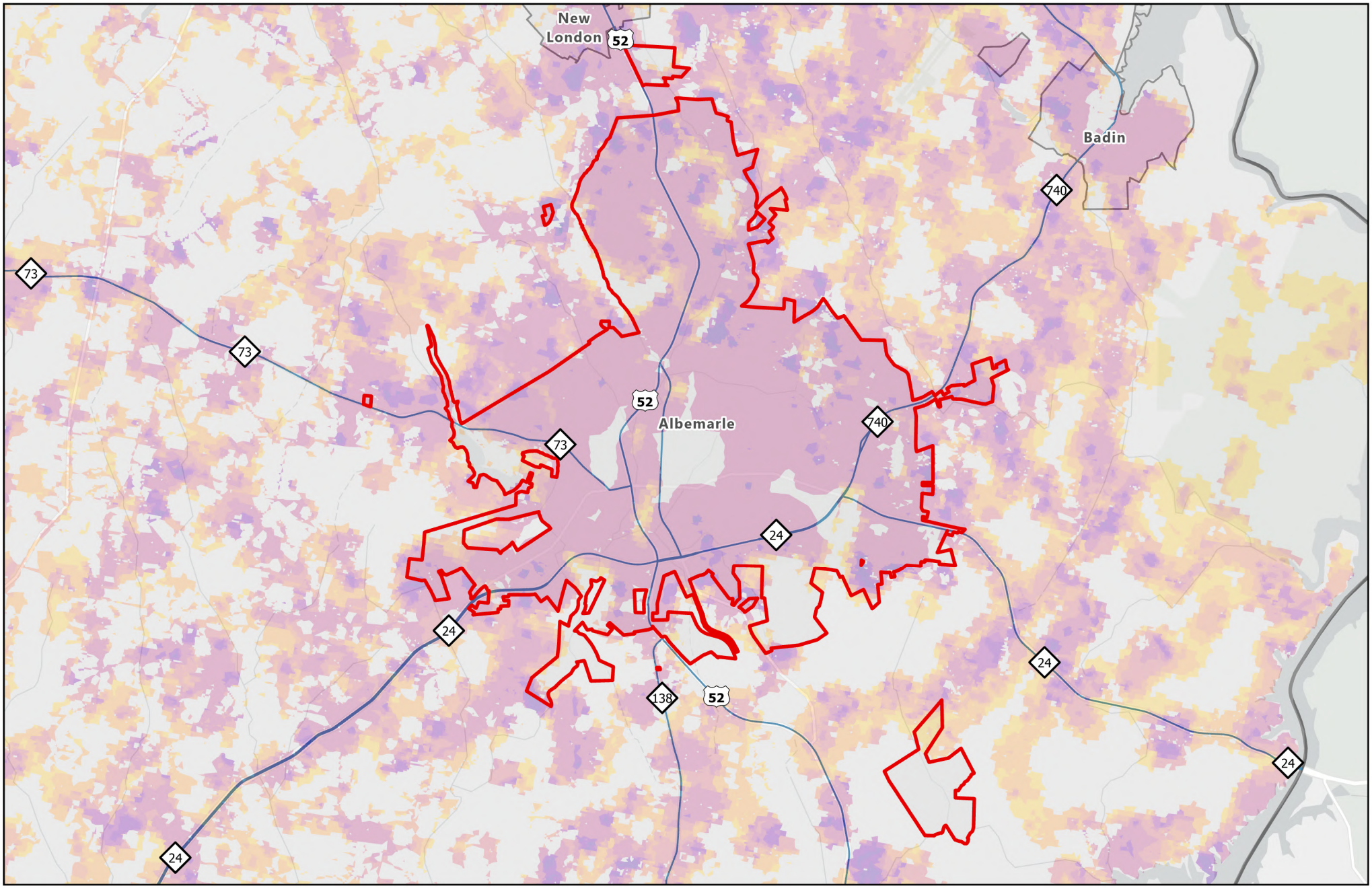
Data Source: Flood Map Service Center, Federal Emergency Management Agency
Product ID: NFHL_37179C
Latest Study Effective Date: 11/16/2018
Latest LOMR Effective Date: 4/8/2024

N

828

Appendix G
Wildfire Hazard Maps

Albemarle - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

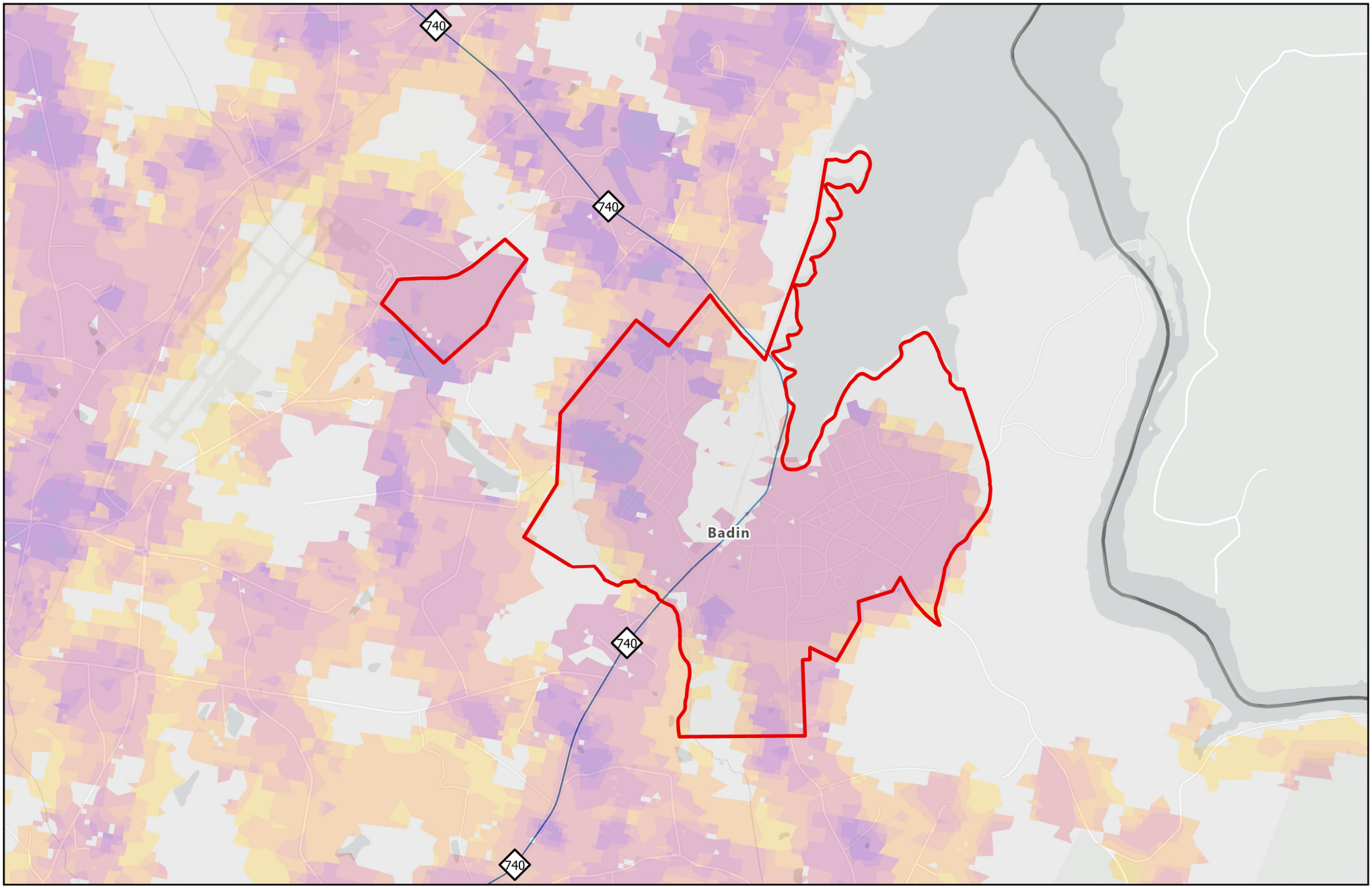
0 1 2 4 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

830

Badin - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

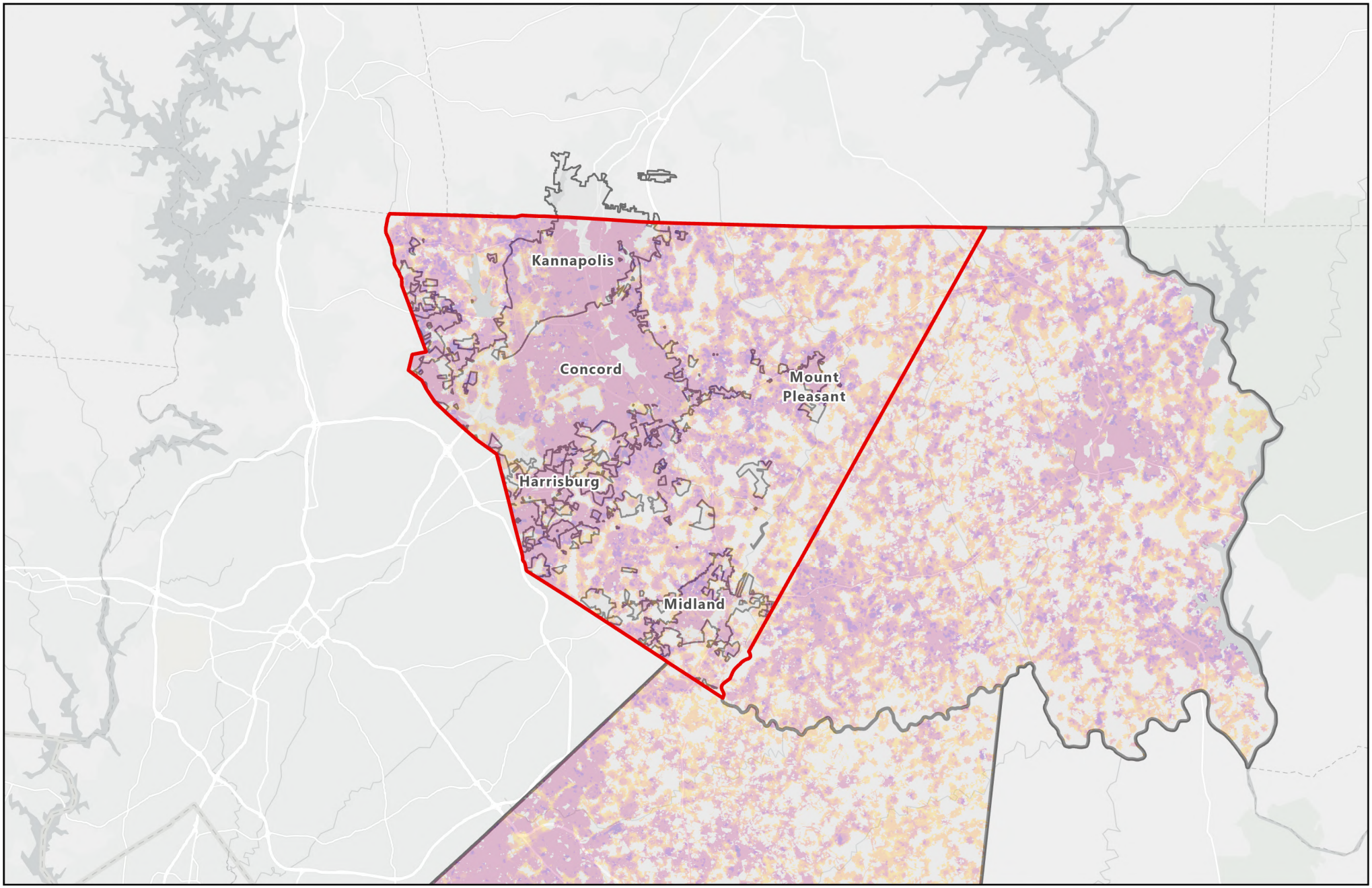
0 0.35 0.7 1.4 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

831

Cabarrus County - Wildland Urban Interface (WUI) Risk Areas



Legend

- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

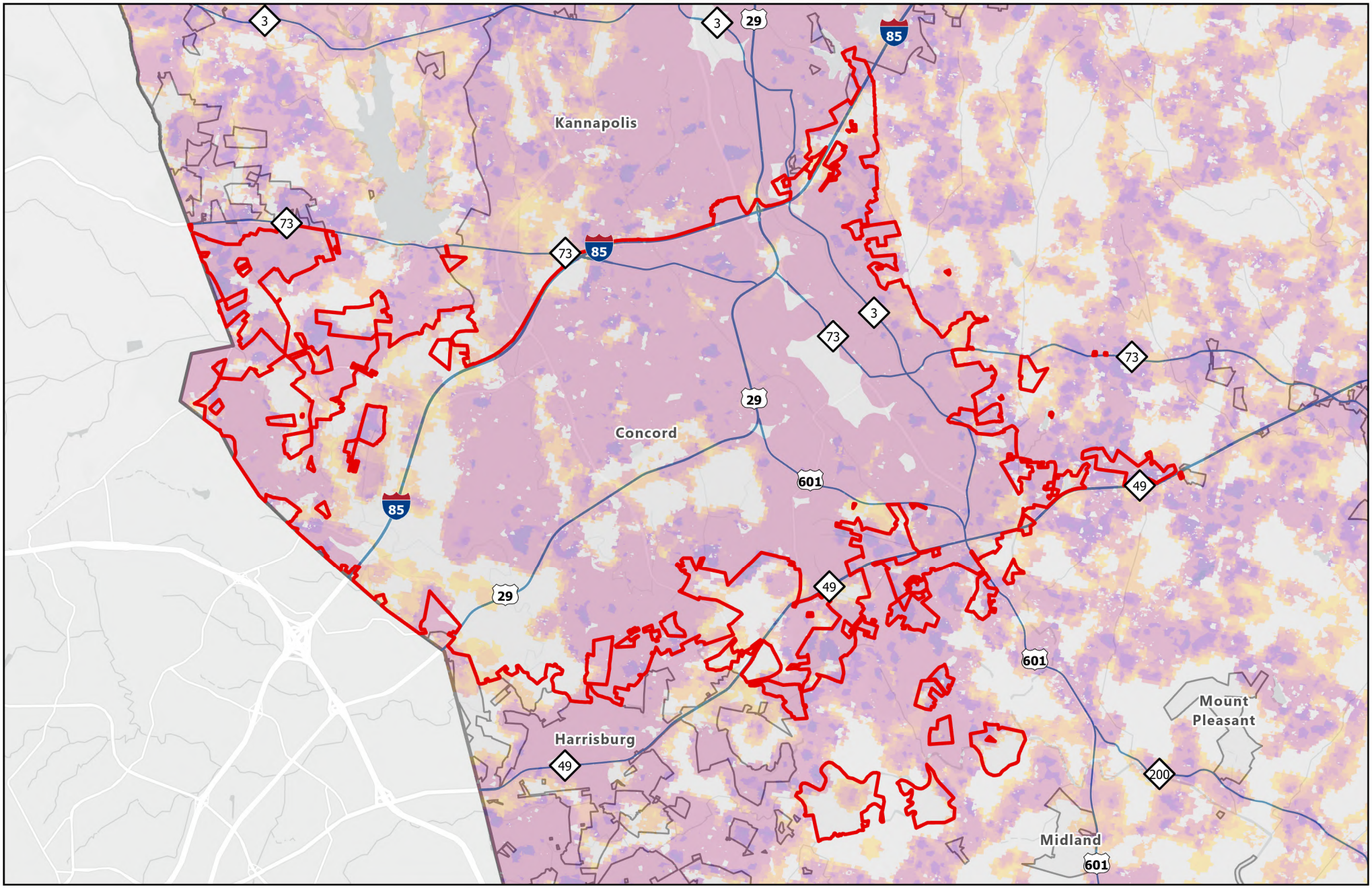
Low High

0 4.5 9 18 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

Concord - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

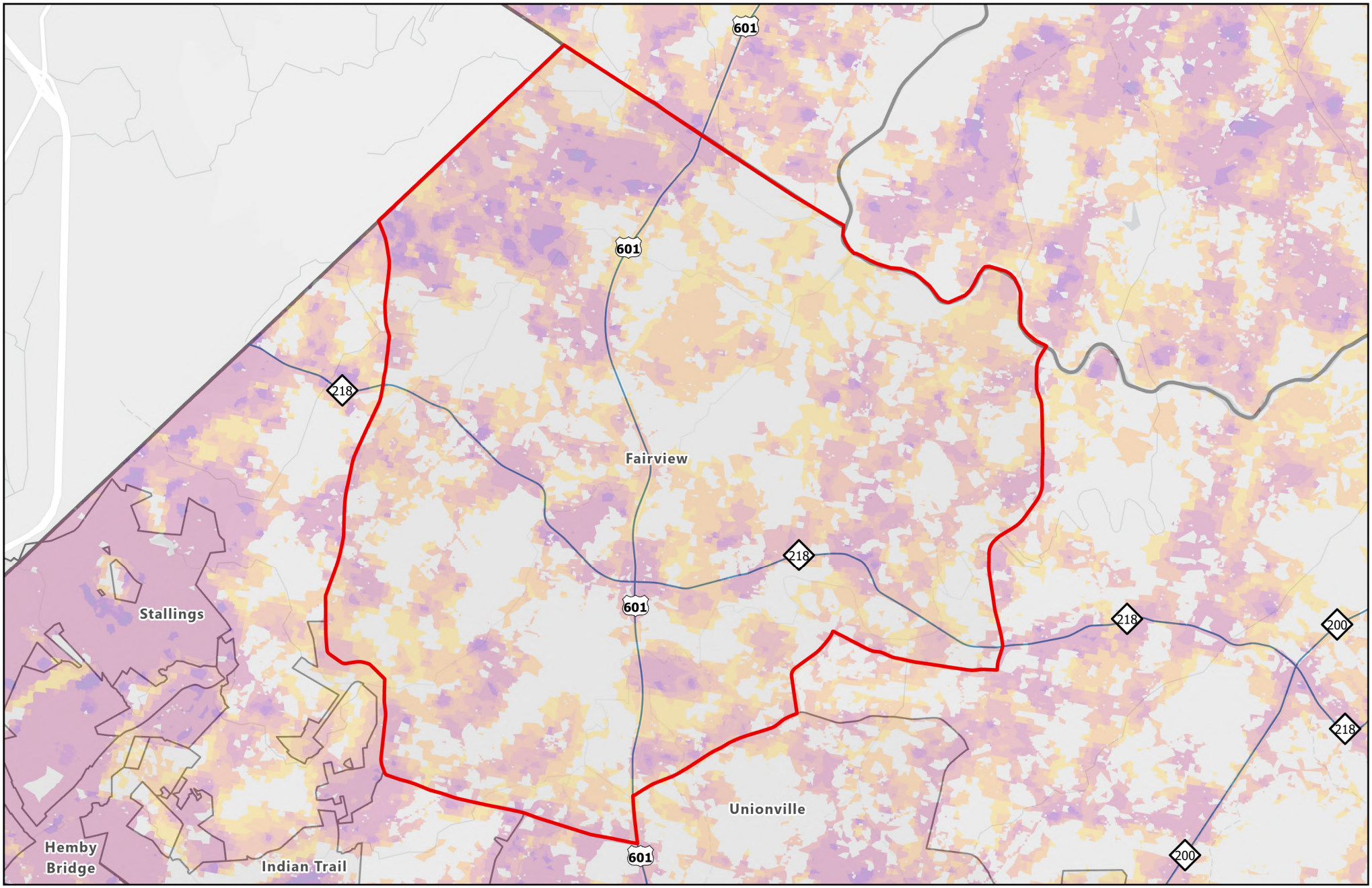
Low High

0 1.5 3 6 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

Fairview - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

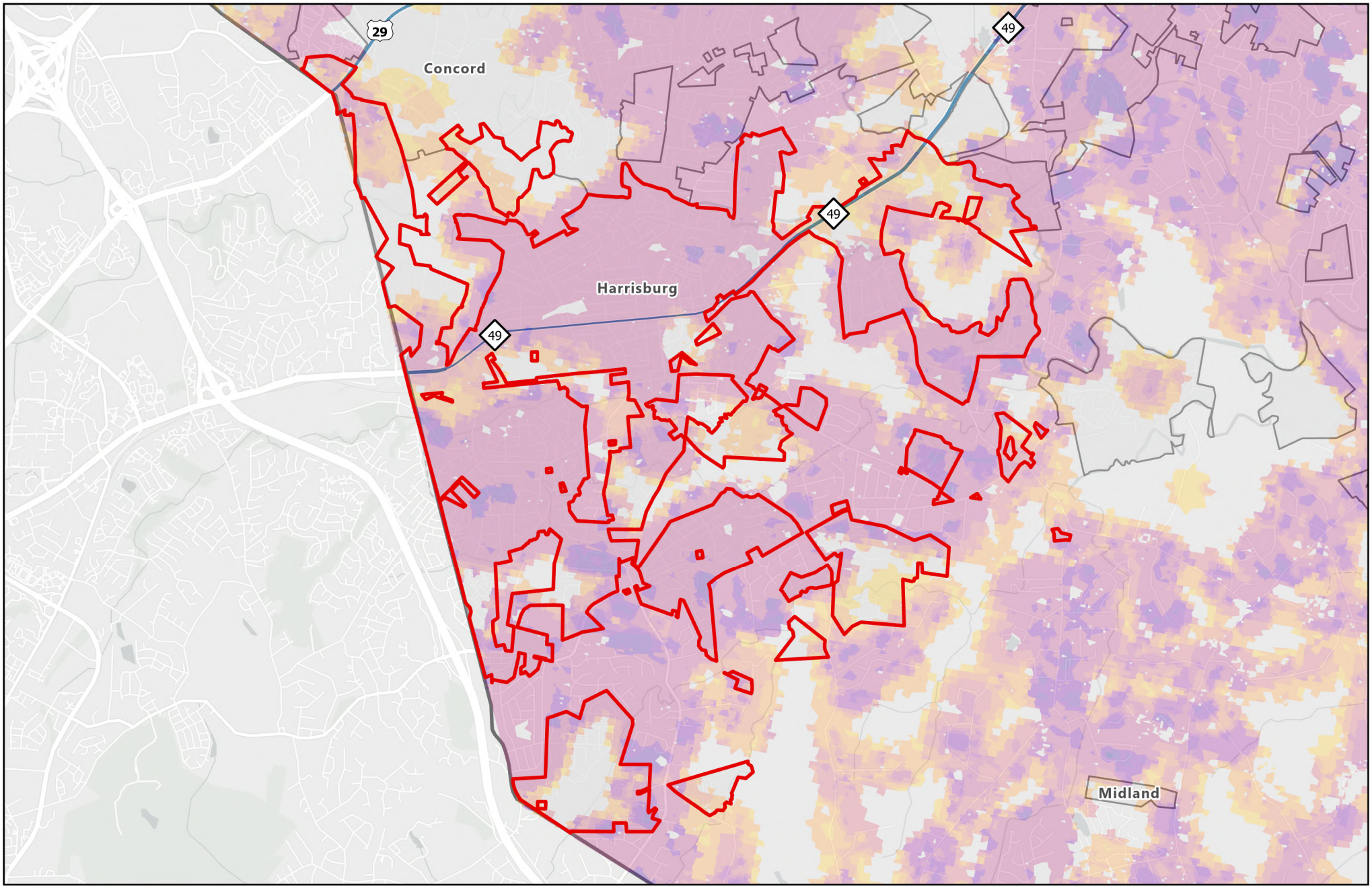
0 0.75 1.5 3 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

834

Harrisburg - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

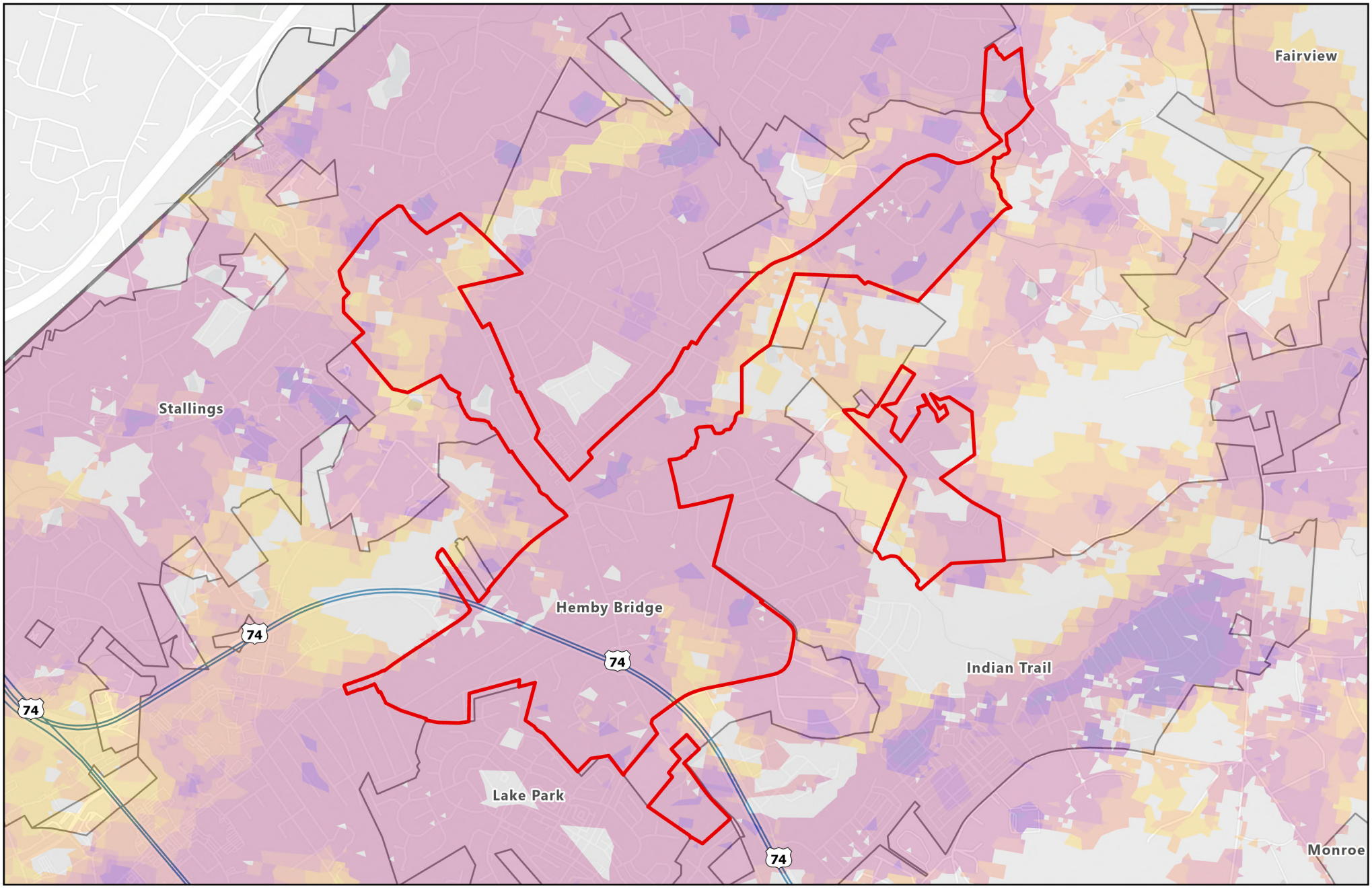
0 0.75 1.5 3 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

835

Hemby Bridge - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

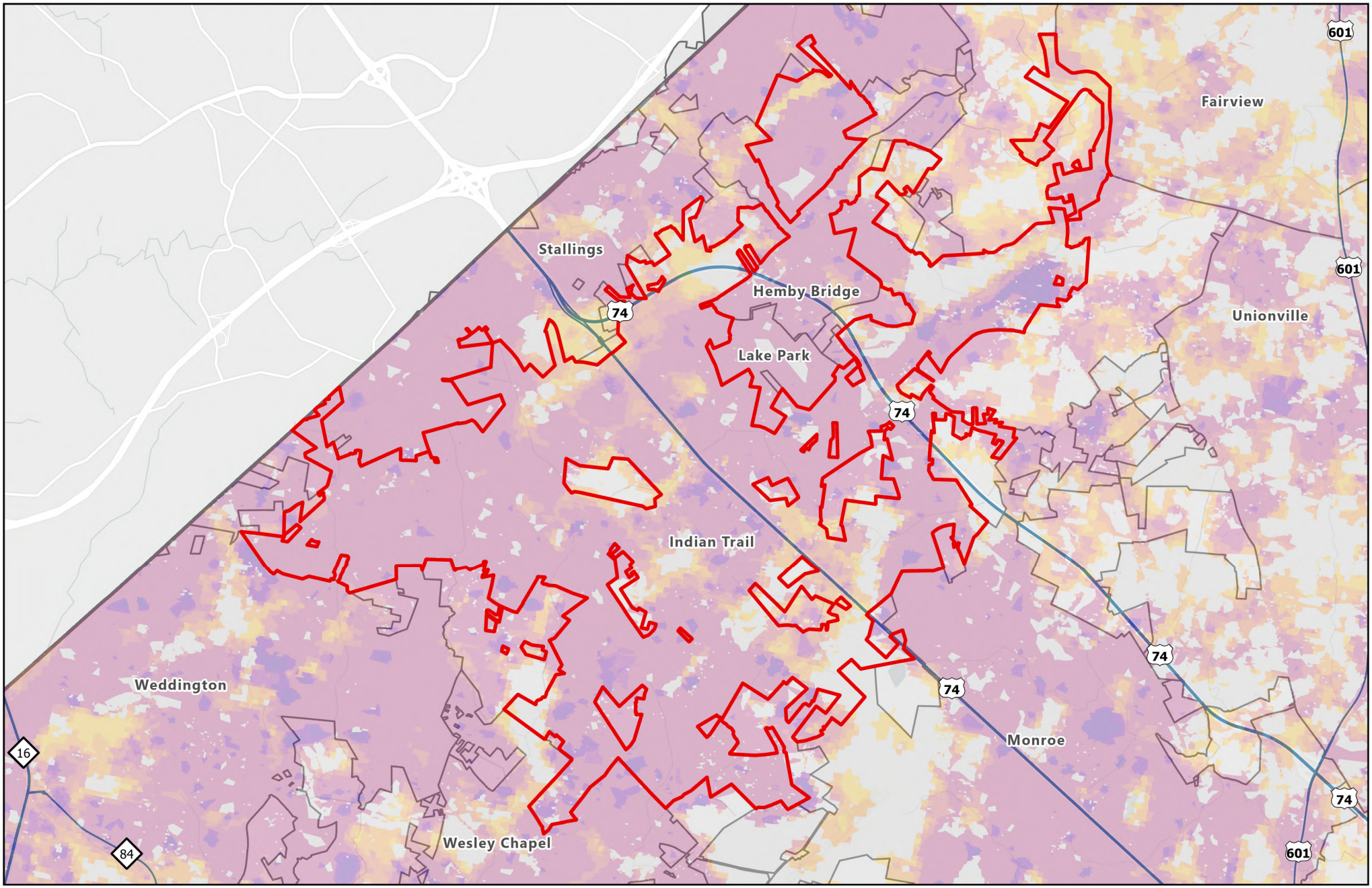
0 0.38 0.75 1.5 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

836

Indian Trail - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

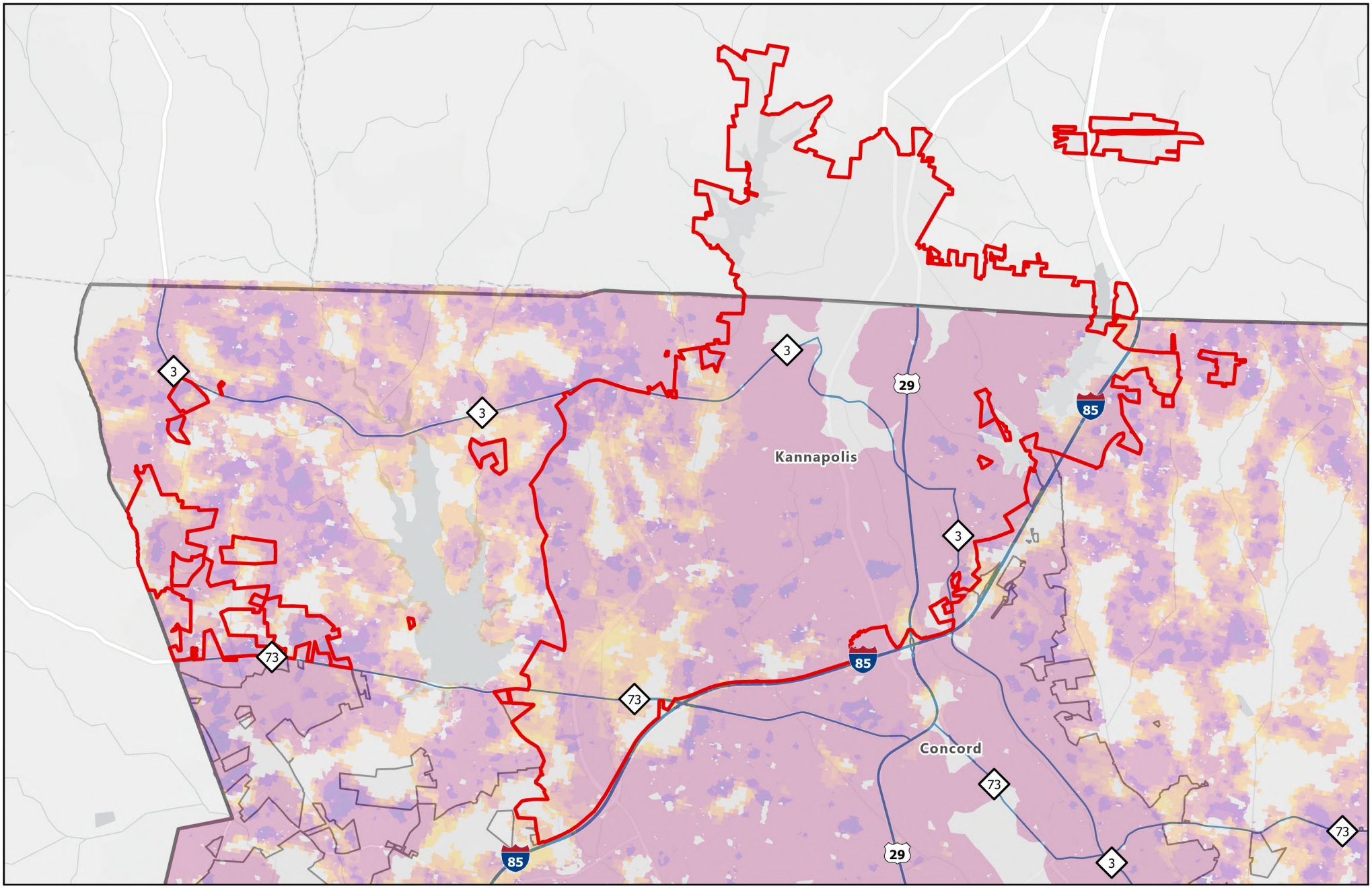
0 1 2 4 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

837

Kannapolis - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

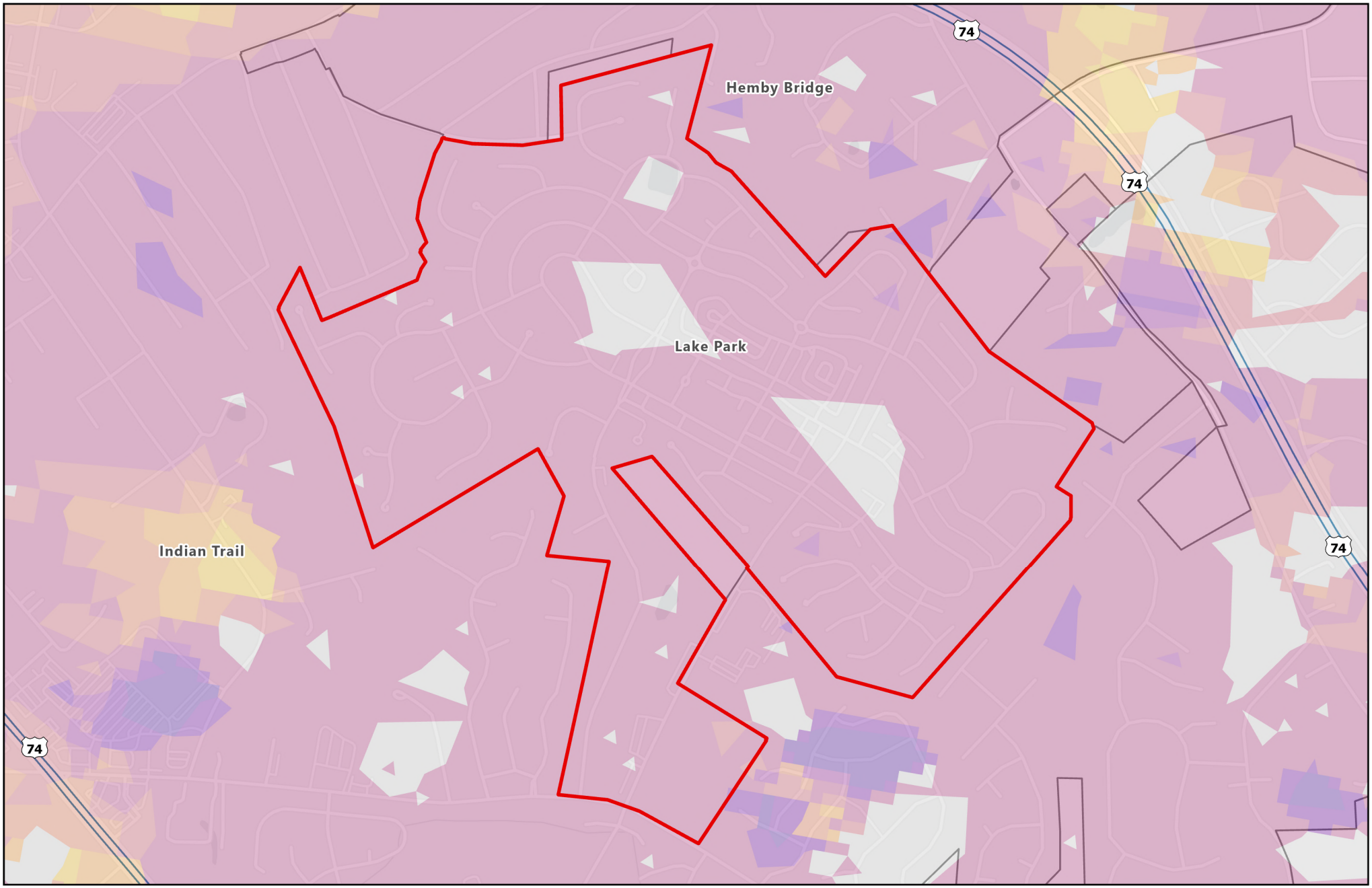
0 1 2 4 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

838

Lake Park - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

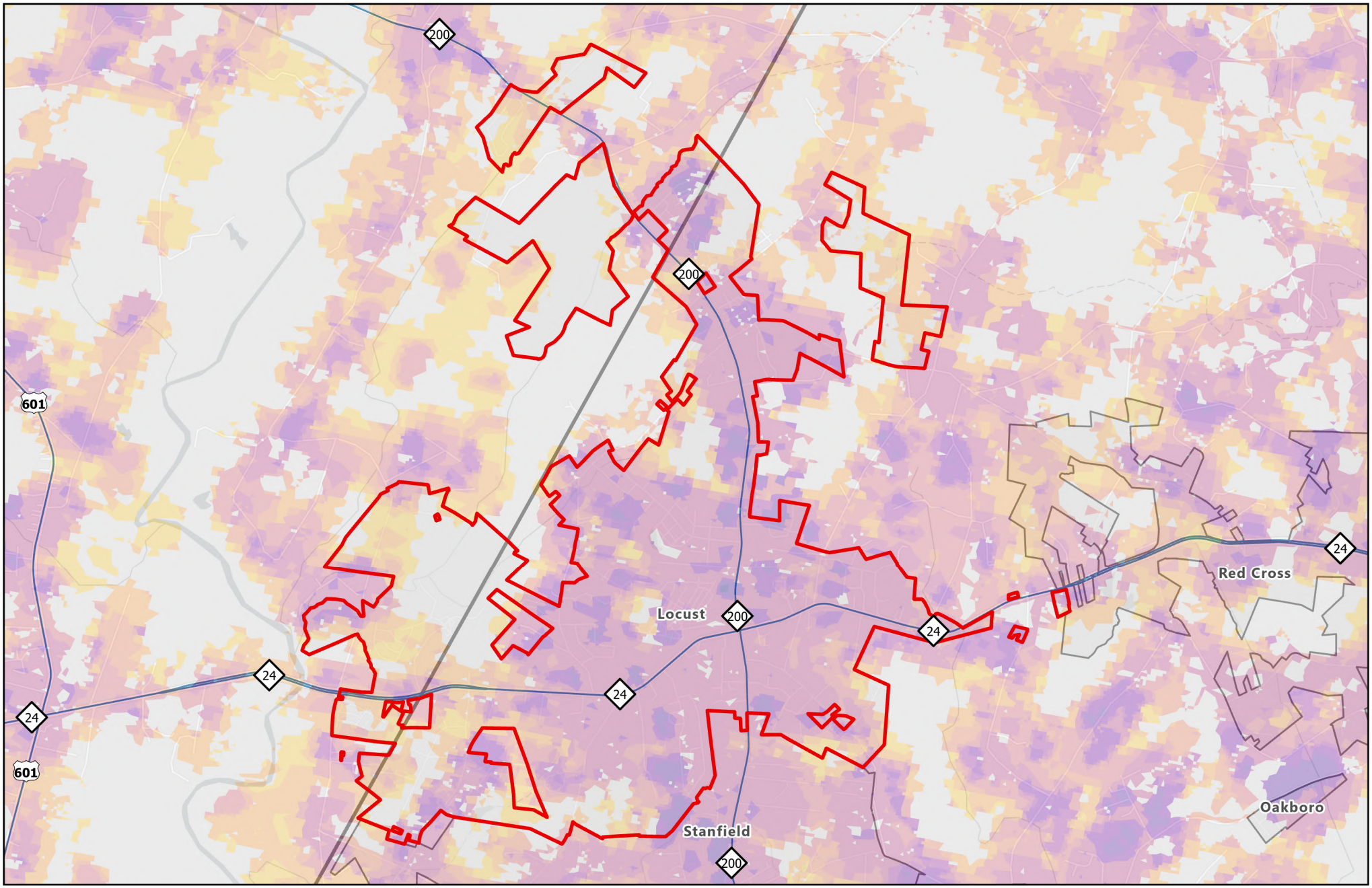
Low High

0 0.15 0.3 0.6 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

Locust - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

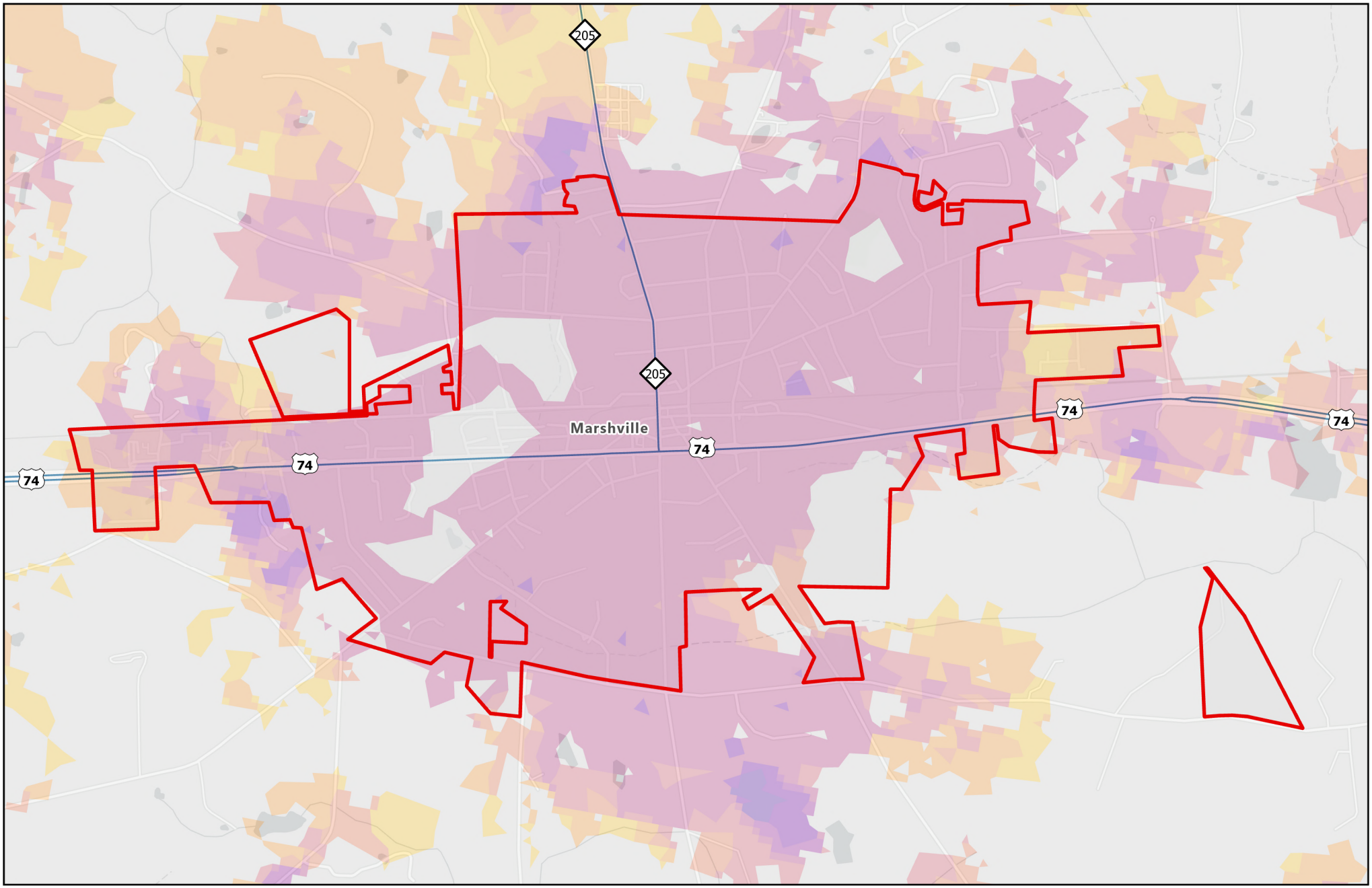
0 0.5 1 2 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

840

Marshville - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

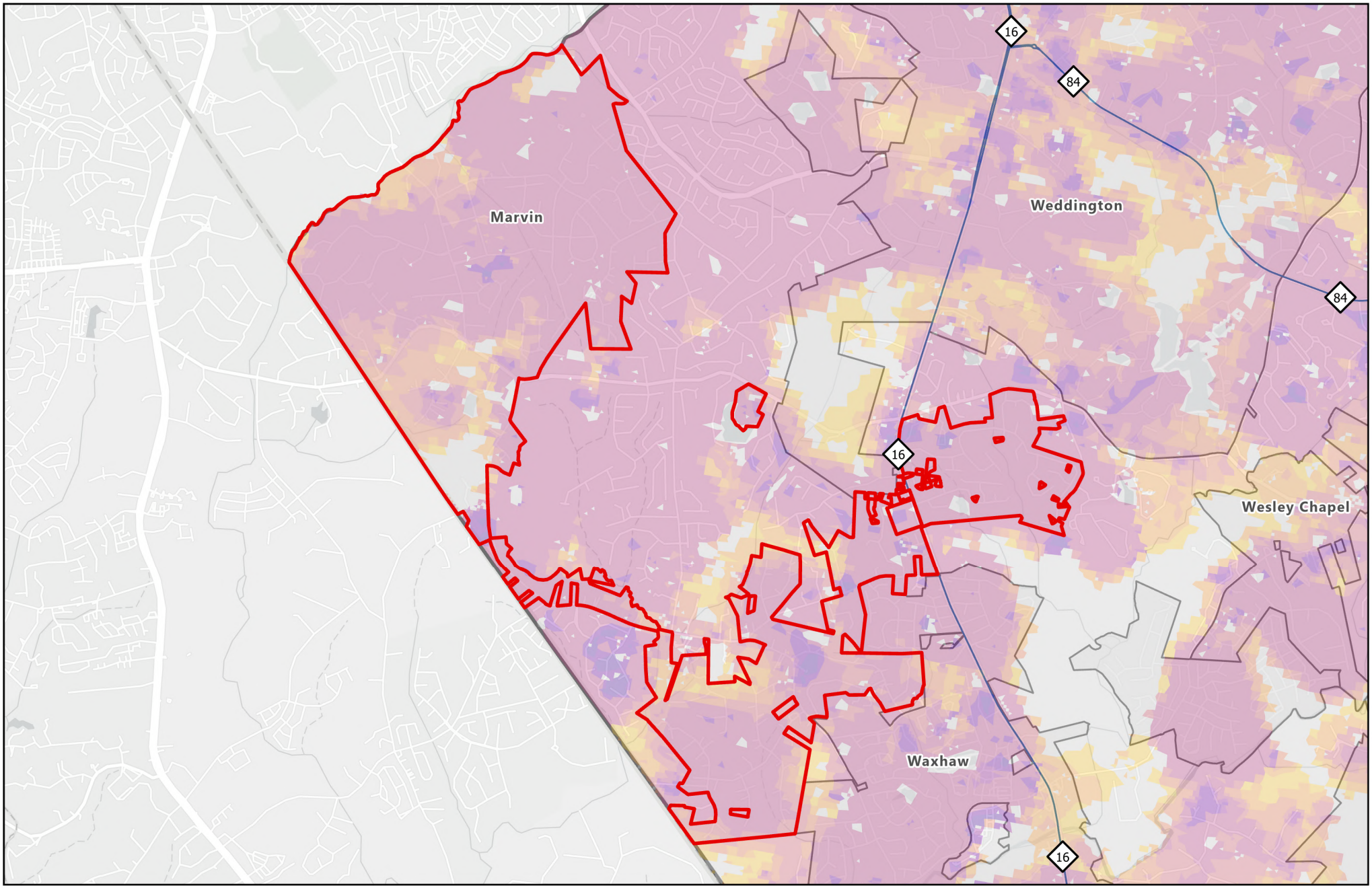
0 0.25 0.5 1 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

841

Marvin - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 Low -3 -6 -9 High

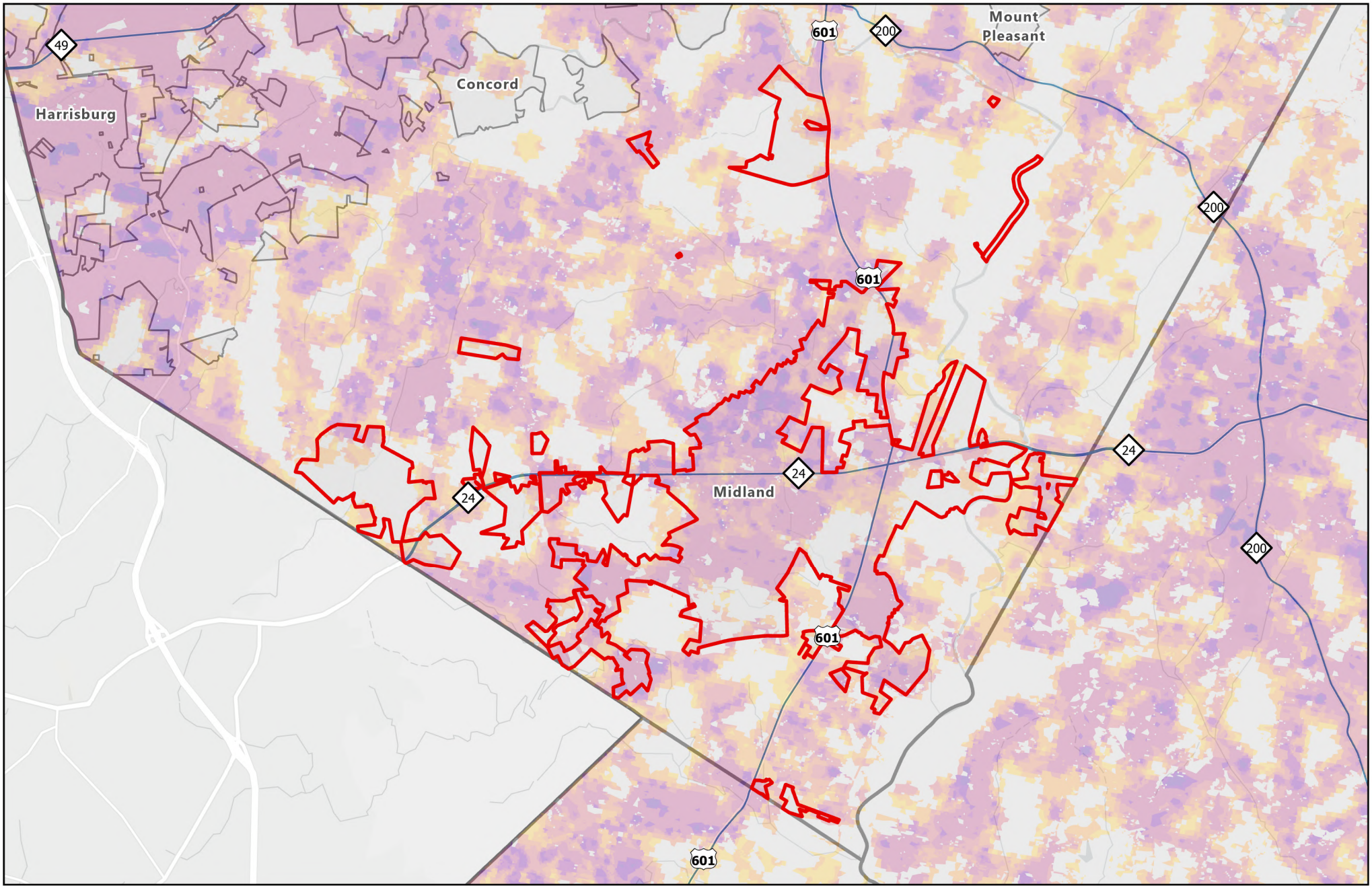
0 0.5 1 2 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

842

Midland - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

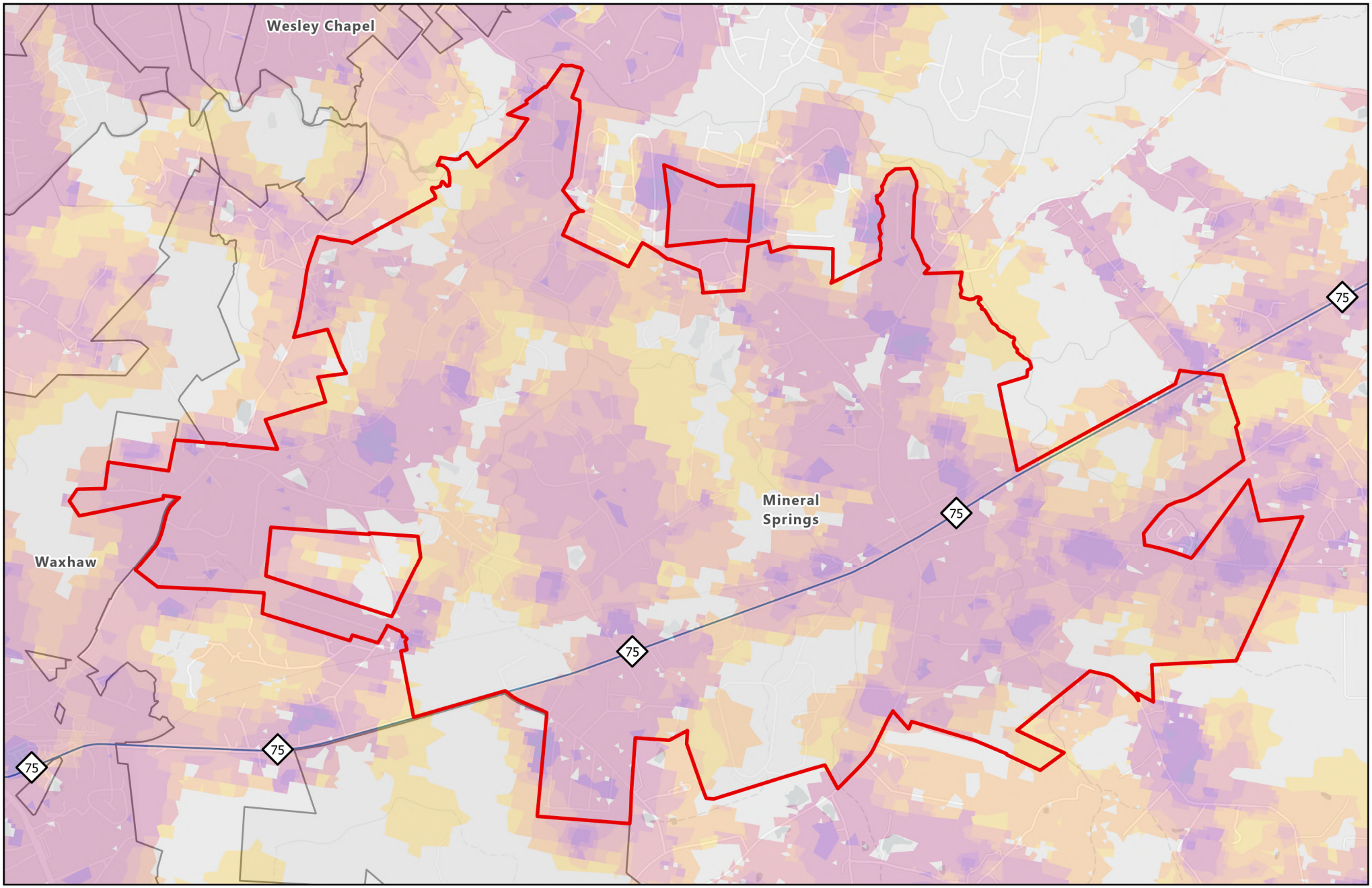
Low High

0 1 2 4 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

Mineral Springs - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

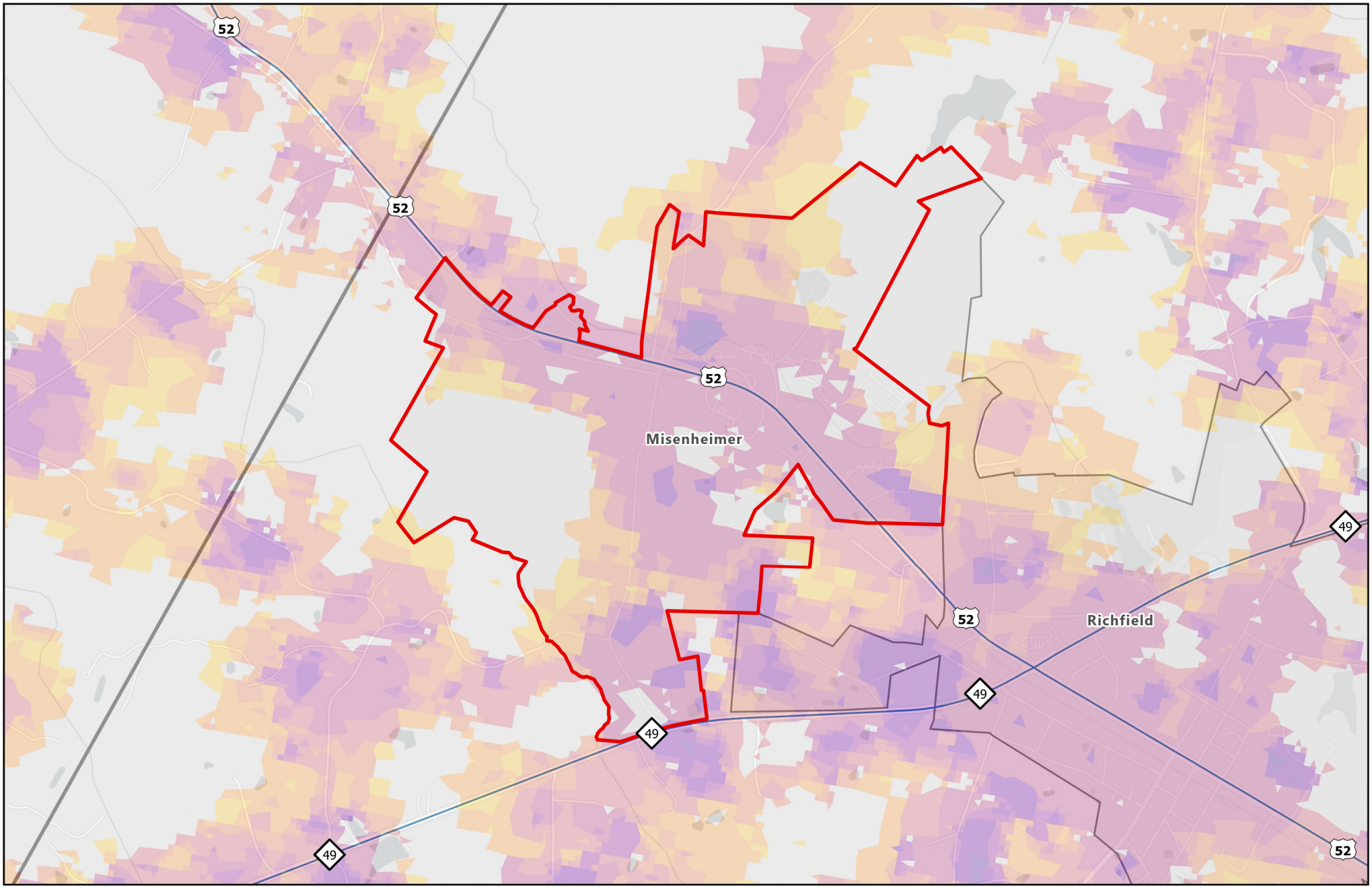
0 0.42 0.85 1.7 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

844

Misenheimer - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

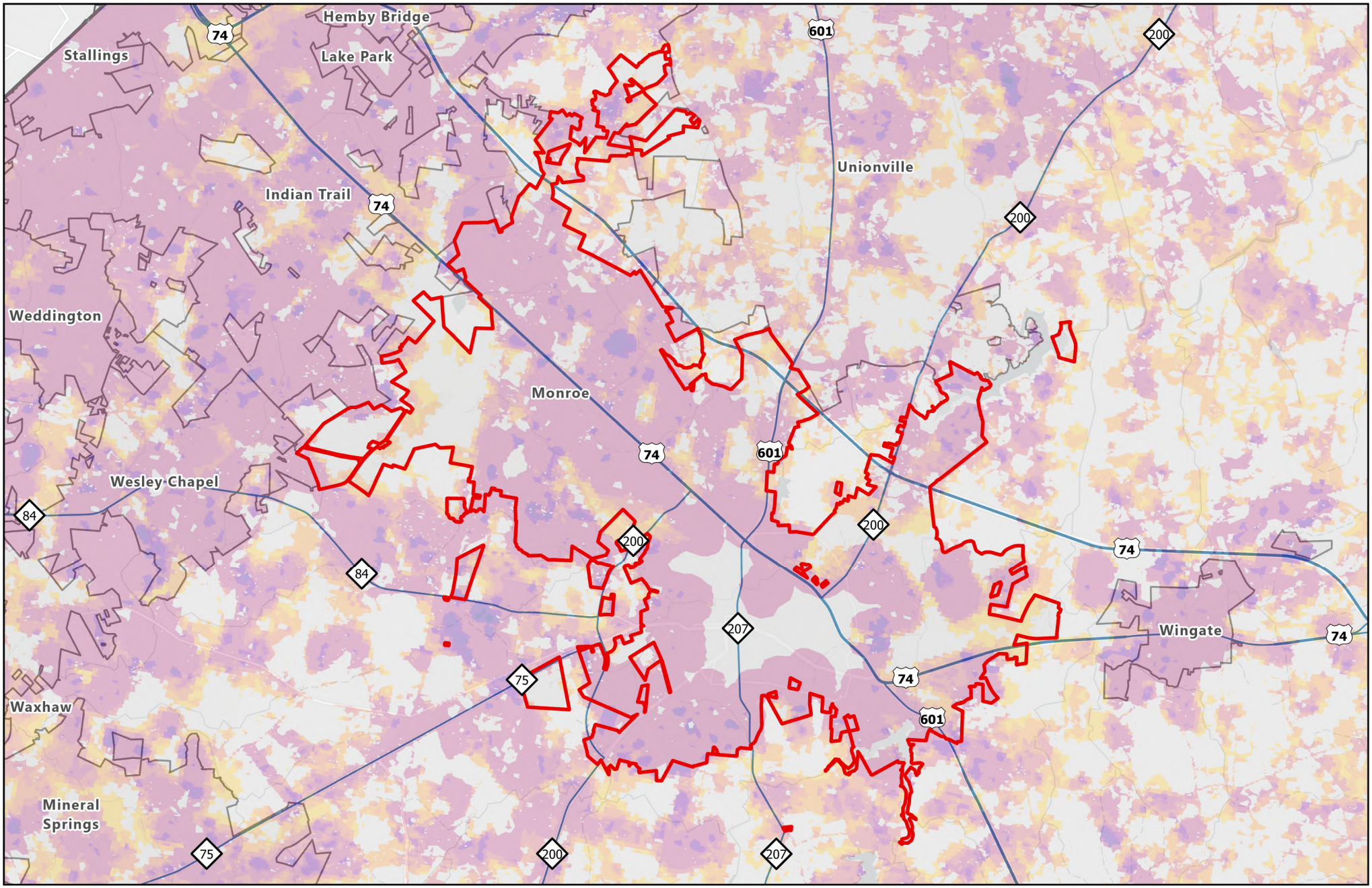
0 0.3 0.6 1.2 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

845

Monroe - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

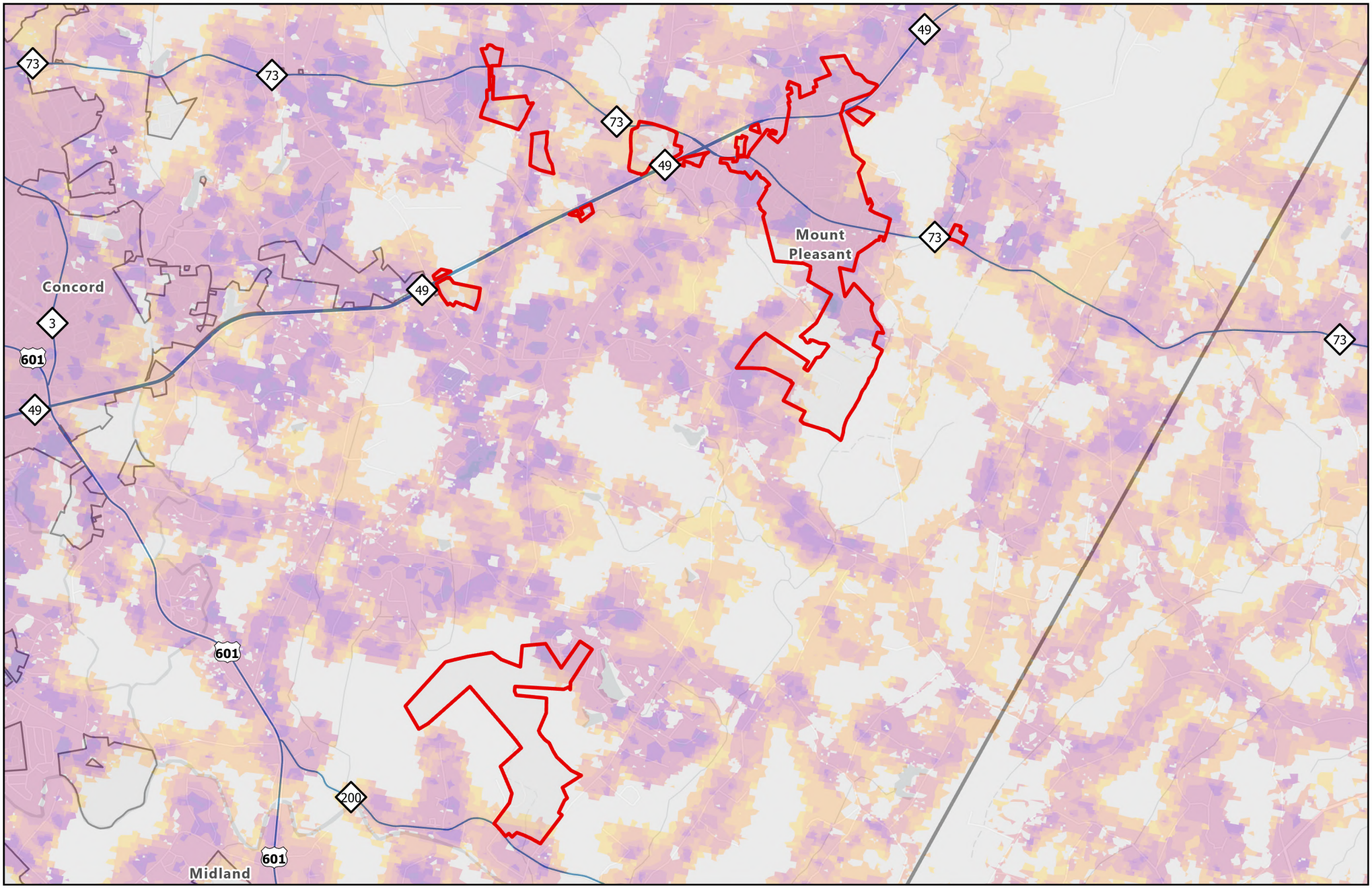
Low High

0 1.25 2.5 5 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

Mount Pleasant - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

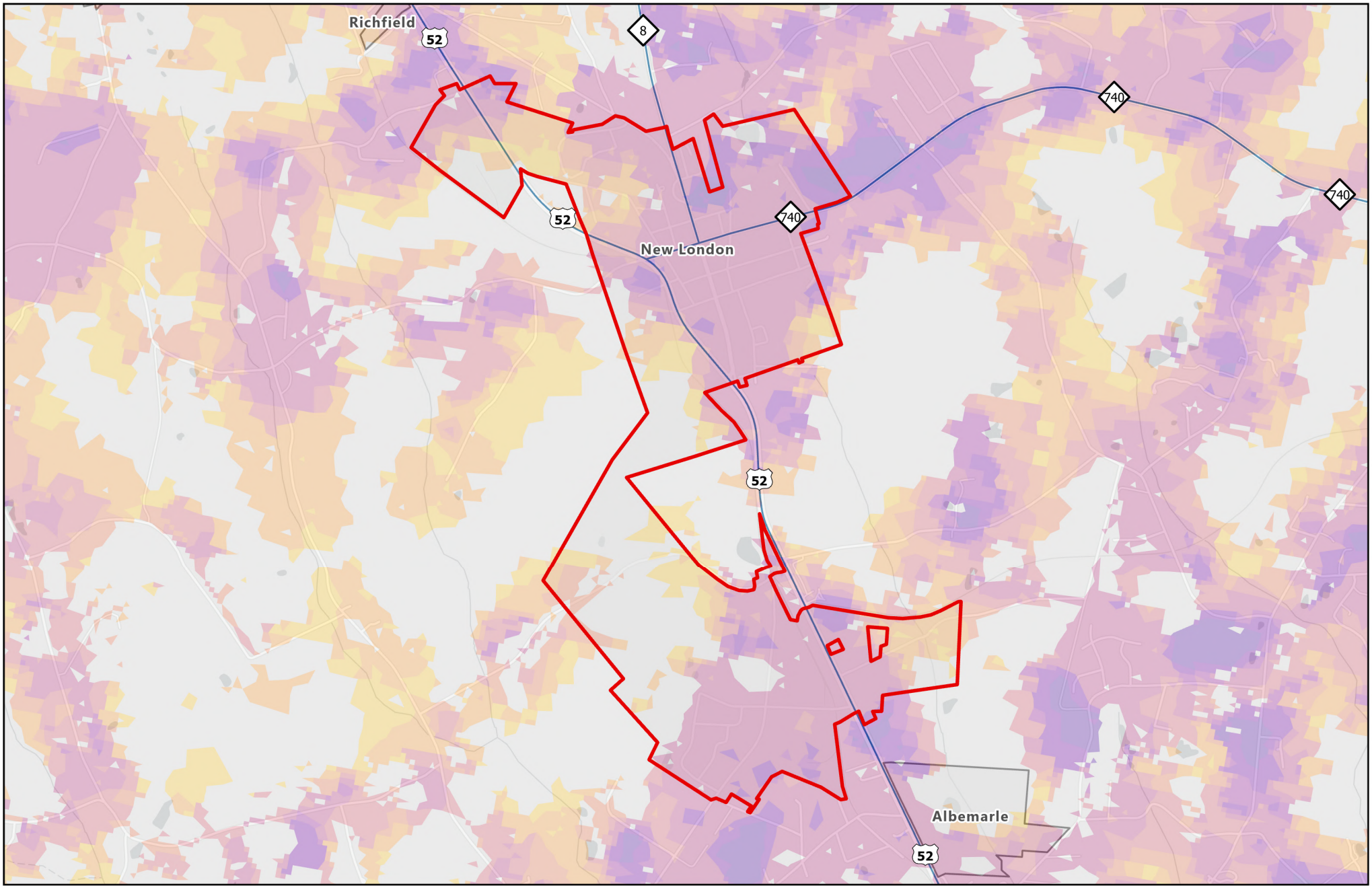
0 0.75 1.5 3 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

847

New London - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

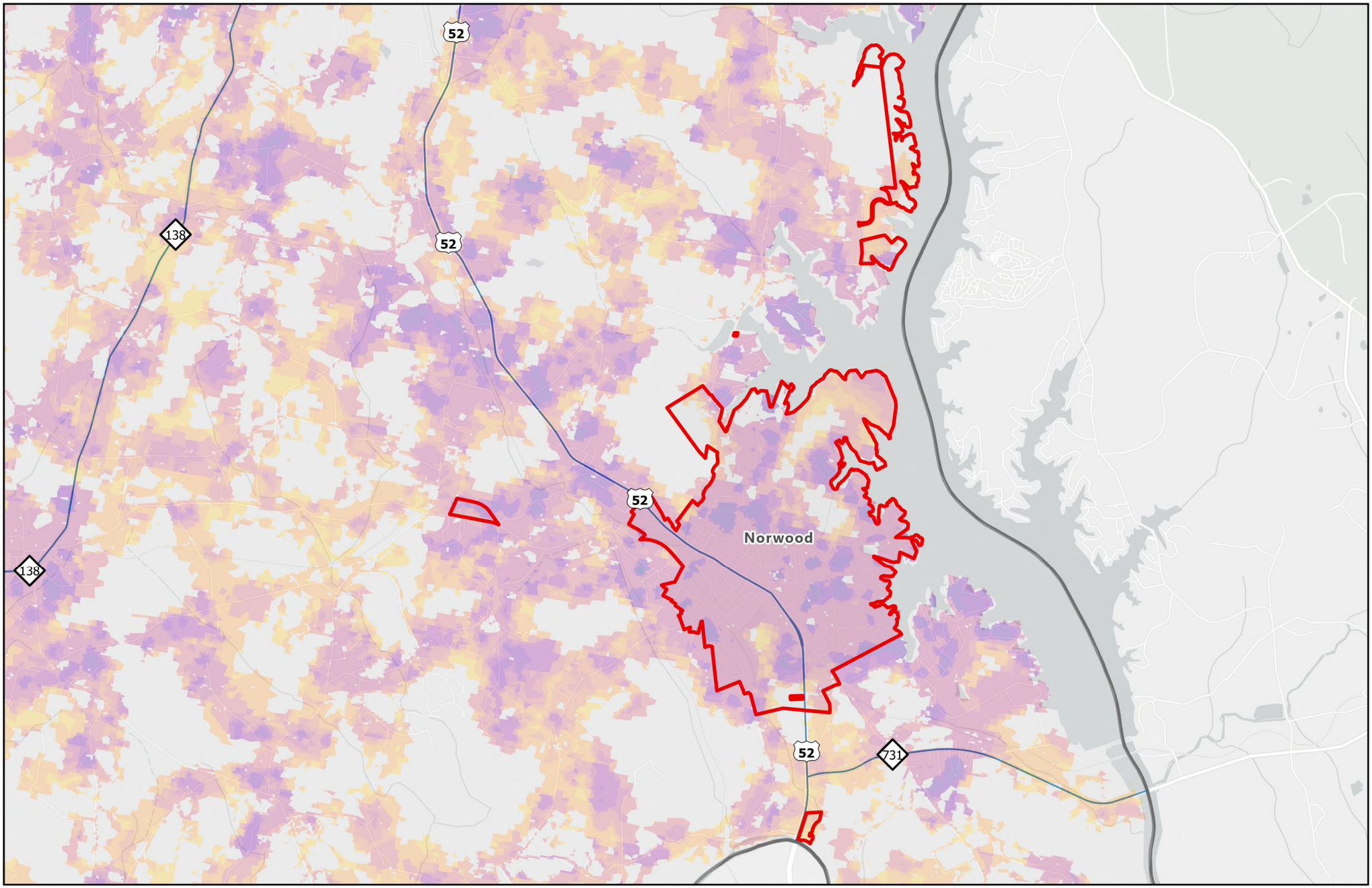
0 0.35 0.7 1.4 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

848

Norwood - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

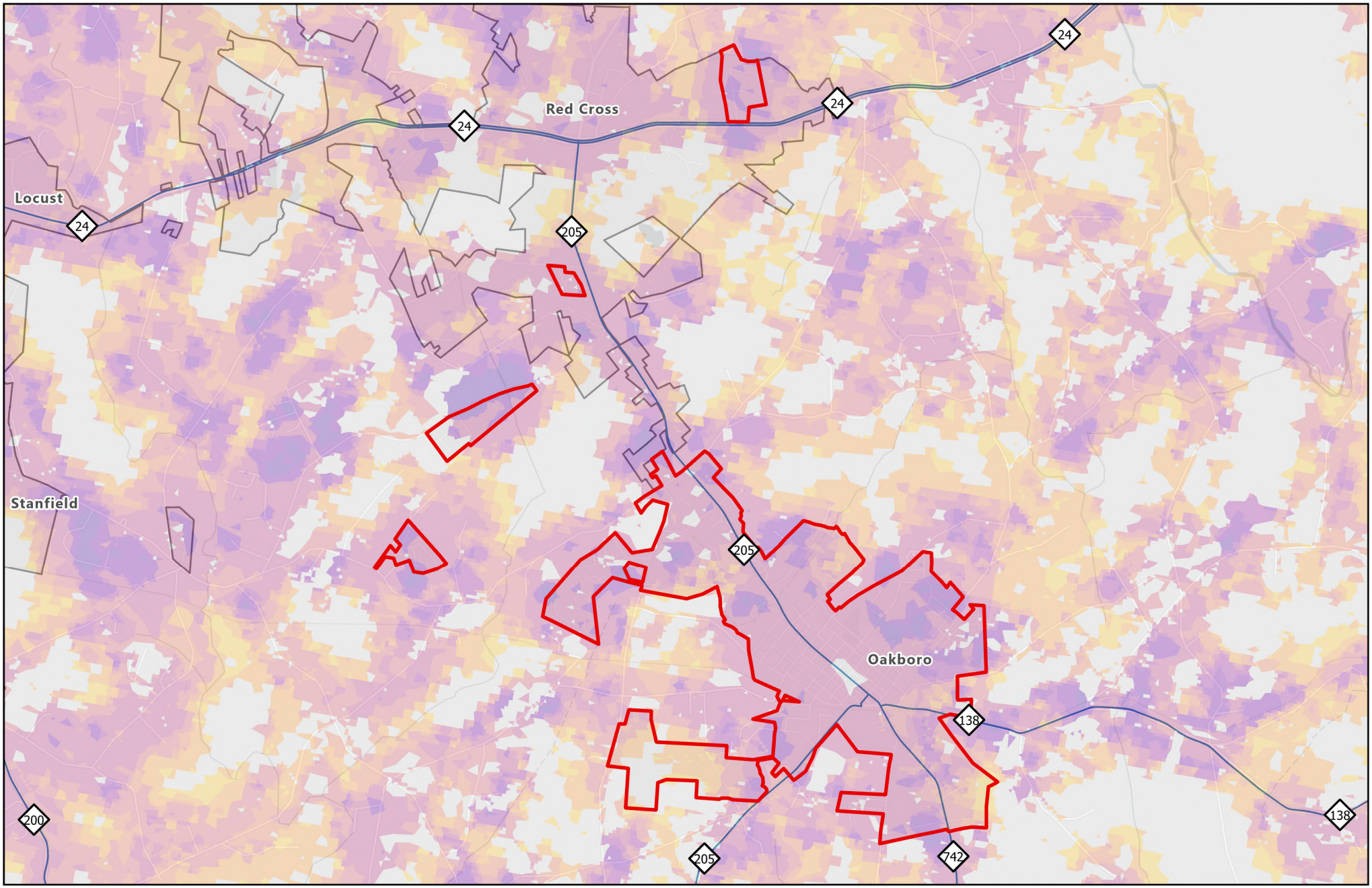
Low High

0 0.75 1.5 3 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

Oakboro - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

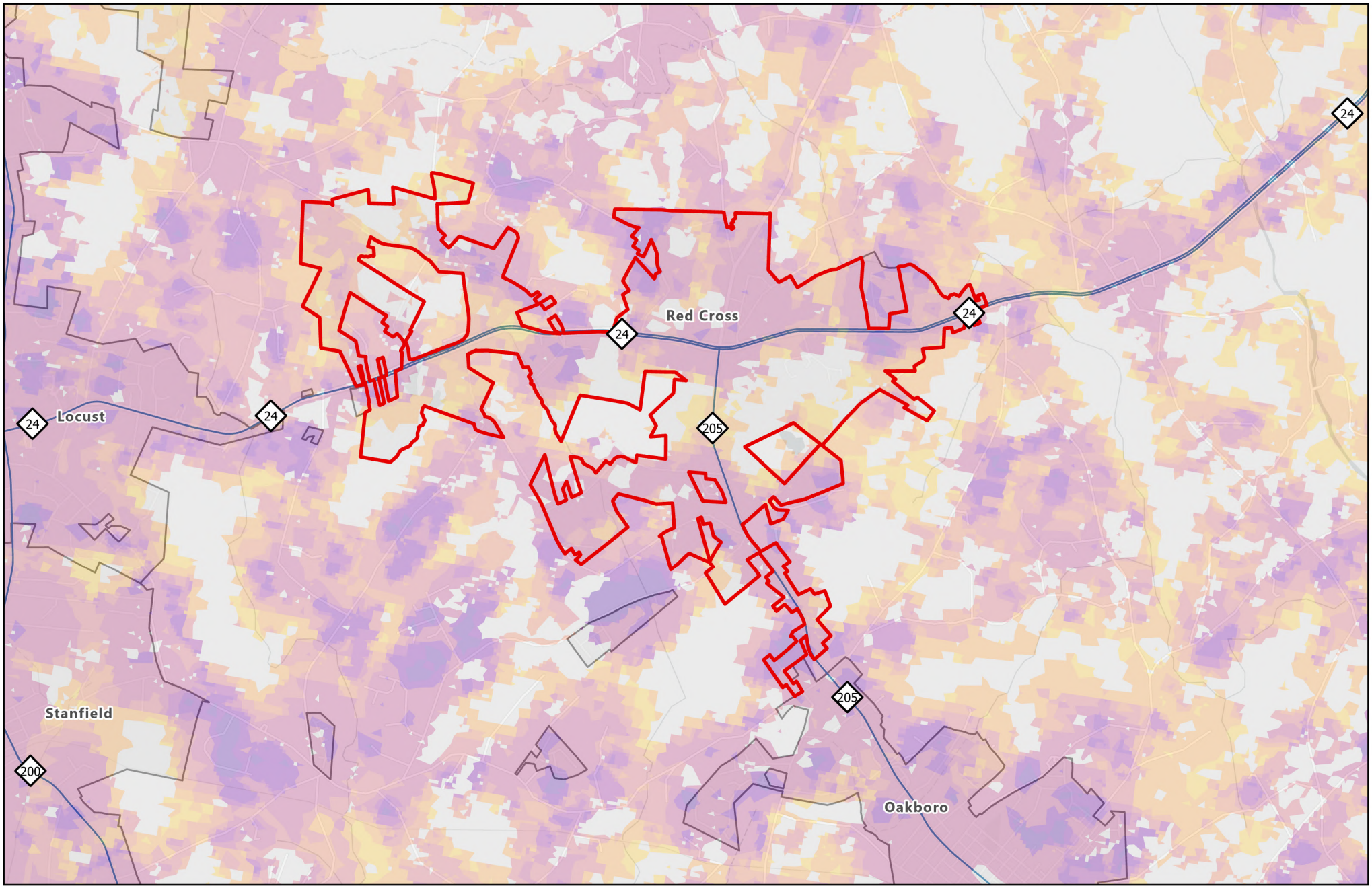
0 0.5 1 2 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

850

Red Cross - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

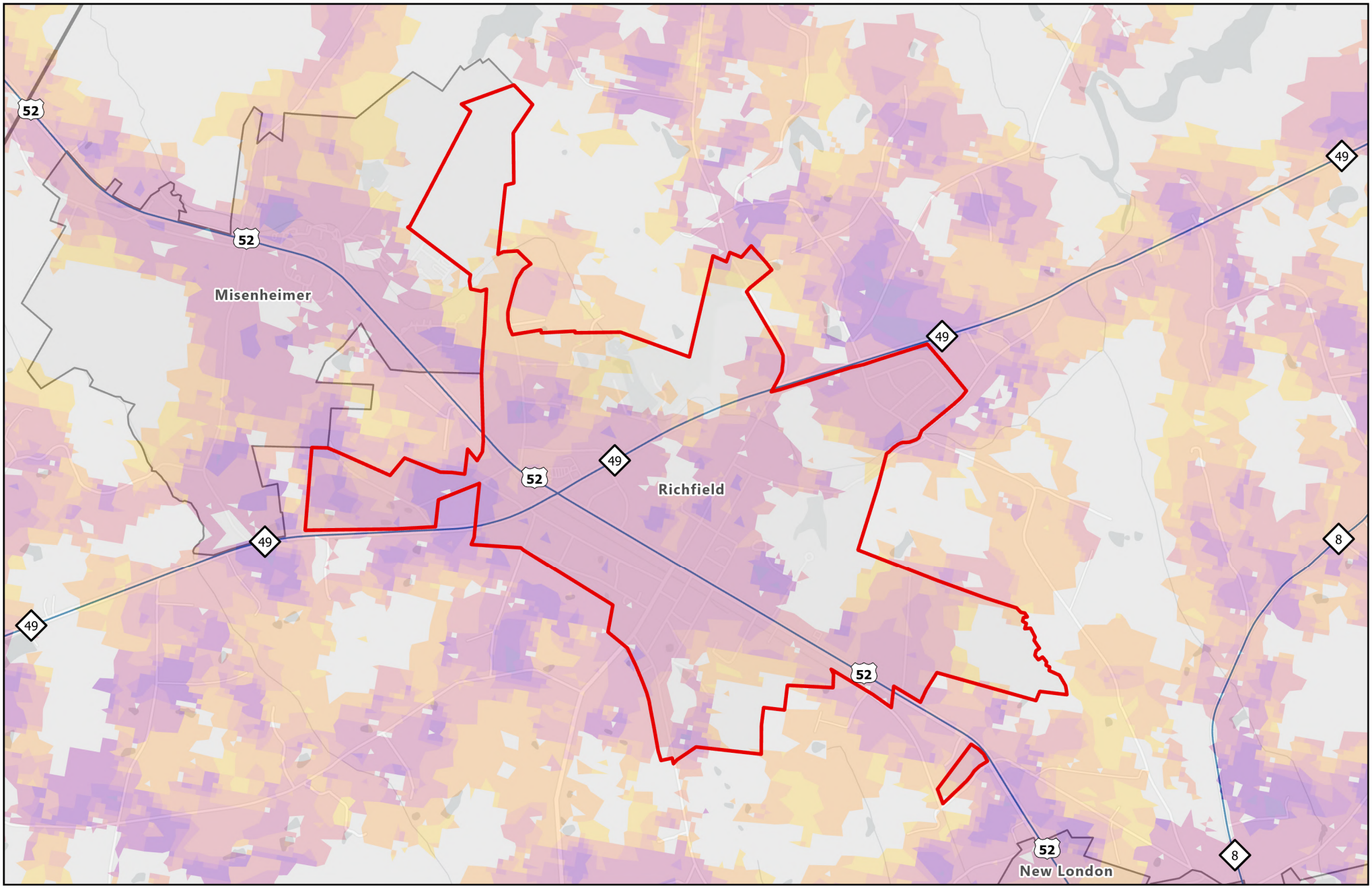
0 0.5 1 2 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

851

Richfield - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

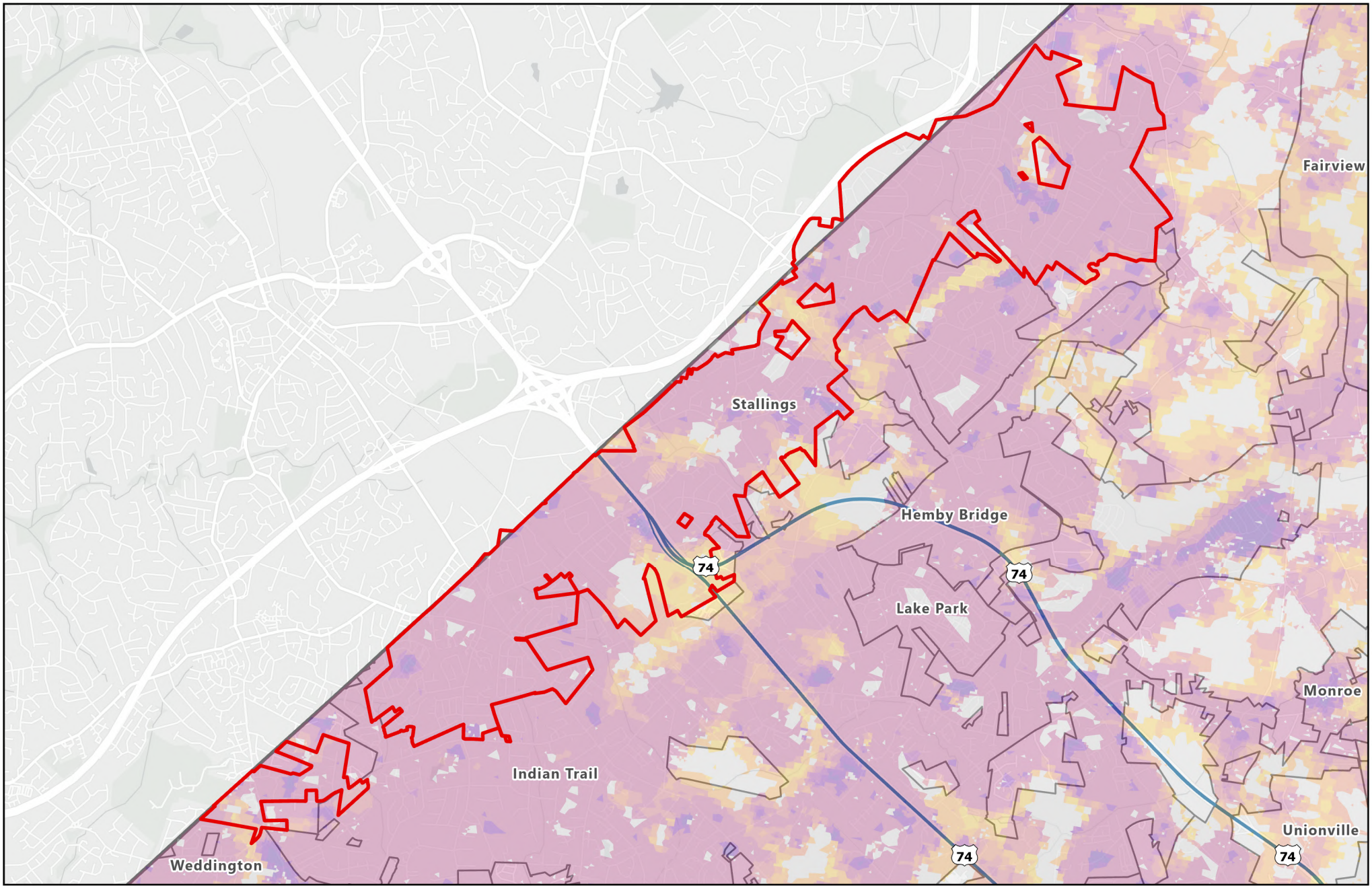
0 0.35 0.7 1.4 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

852

Stallings - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

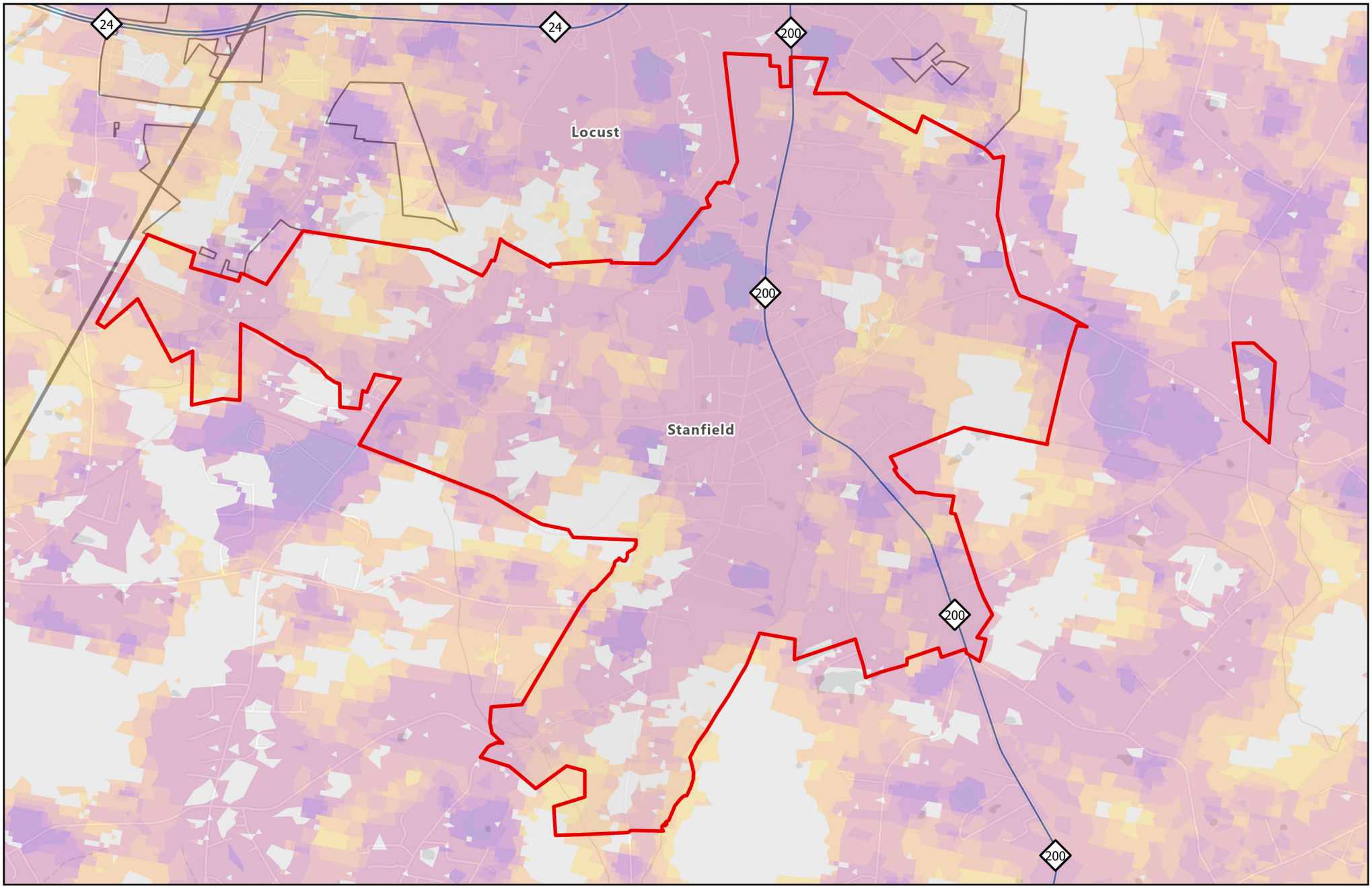
0 0.75 1.5 3 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

853

Stanfield - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

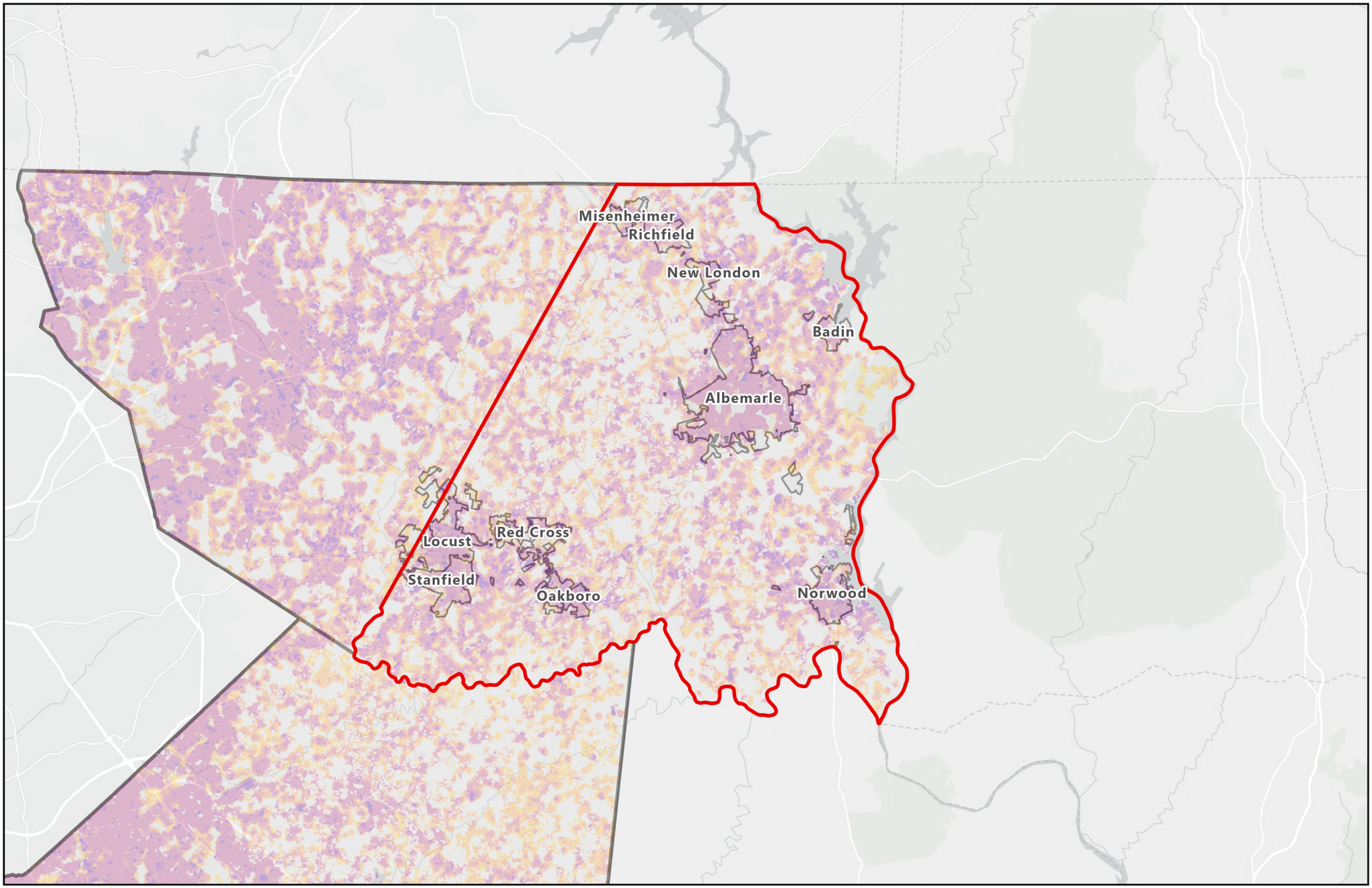
0 0.35 0.7 1.4 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

854

Stanly County - Wildland Urban Interface (WUI) Risk Areas



Legend

- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

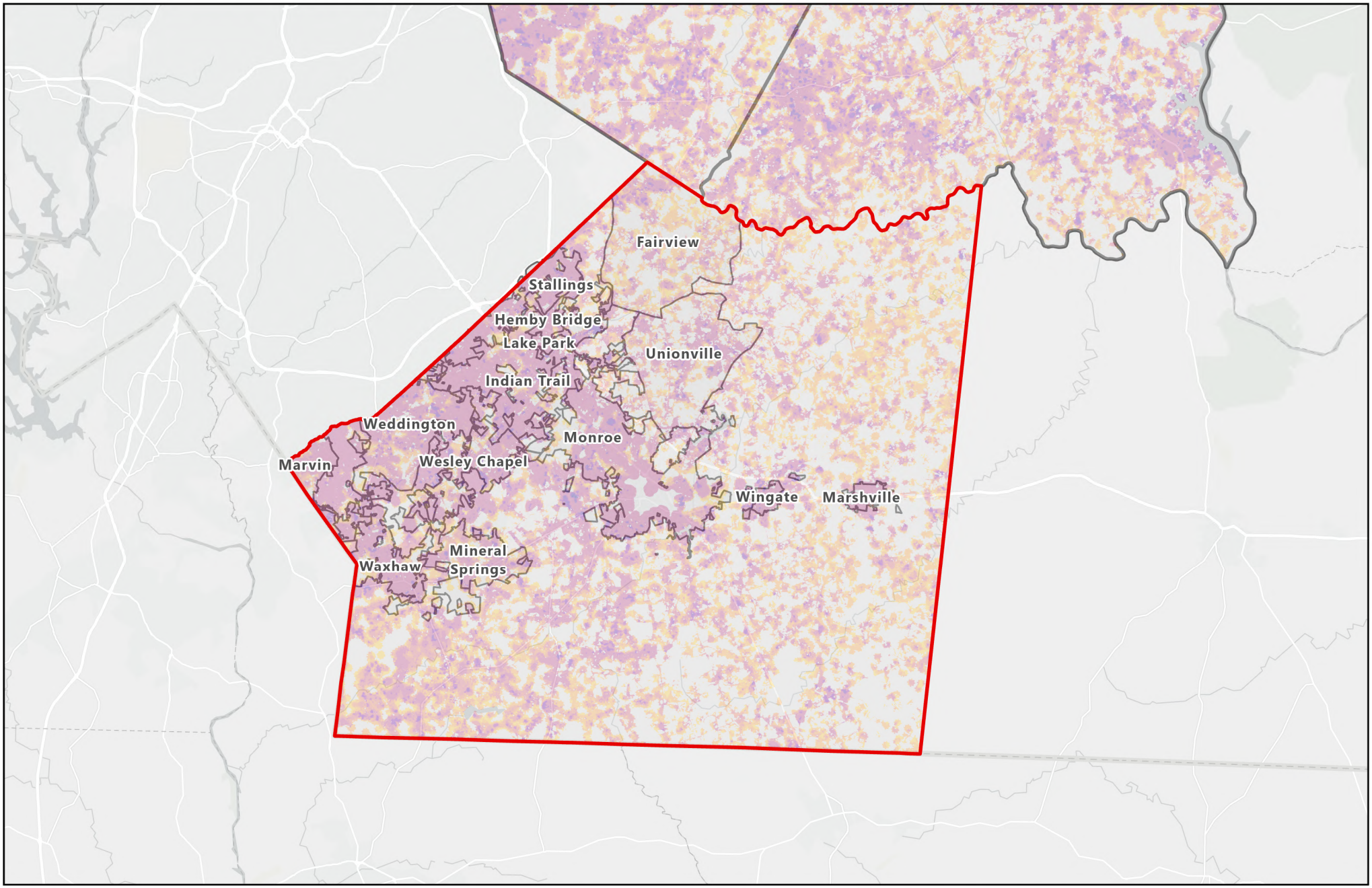
0 4.5 9 18 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

855

Union County - Wildland Urban Interface (WUI) Risk Areas



Legend

- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

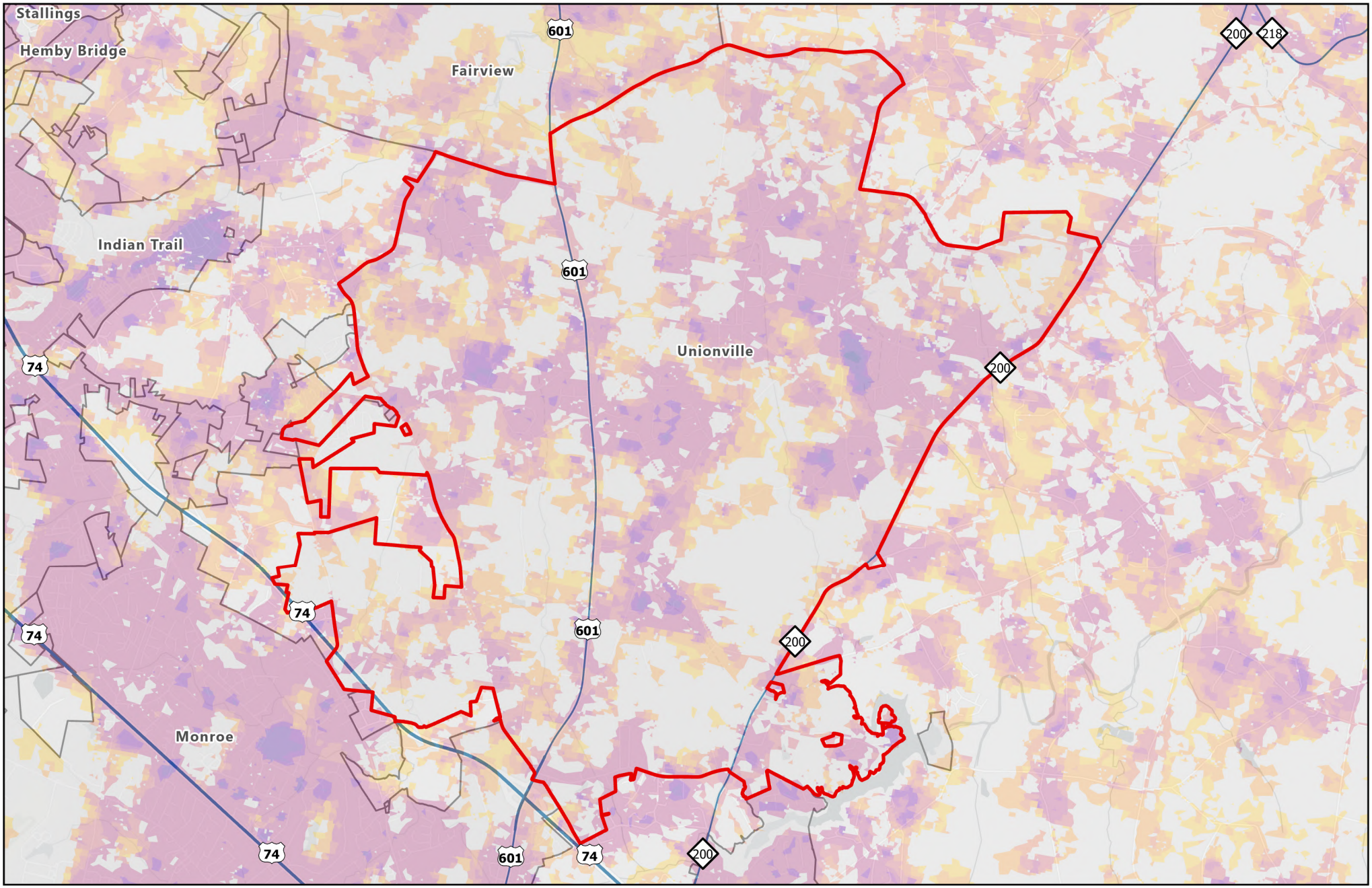
0 4.5 9 18 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

856

Unionville - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

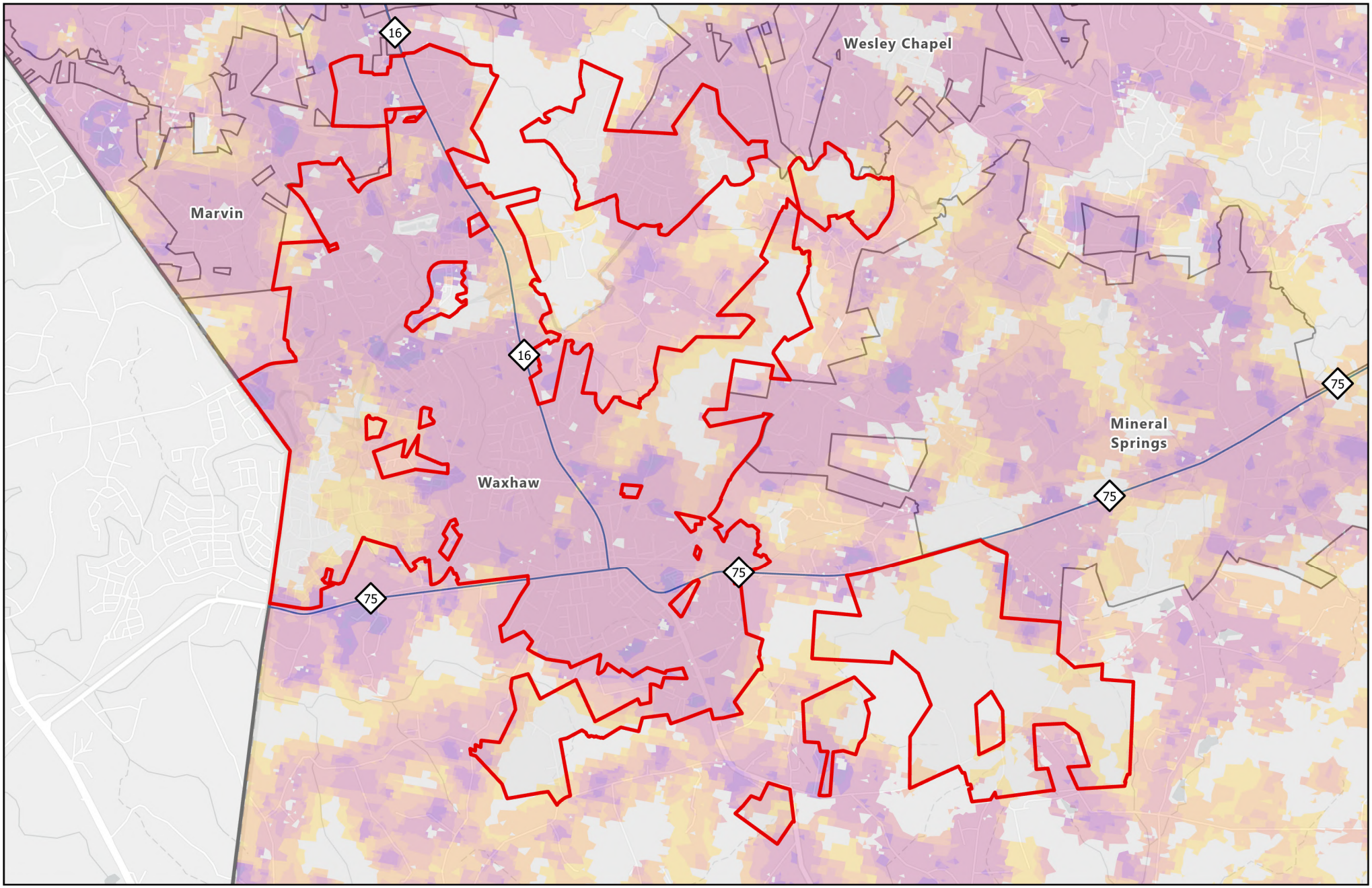
0 0.75 1.5 3 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

857

Waxhaw - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

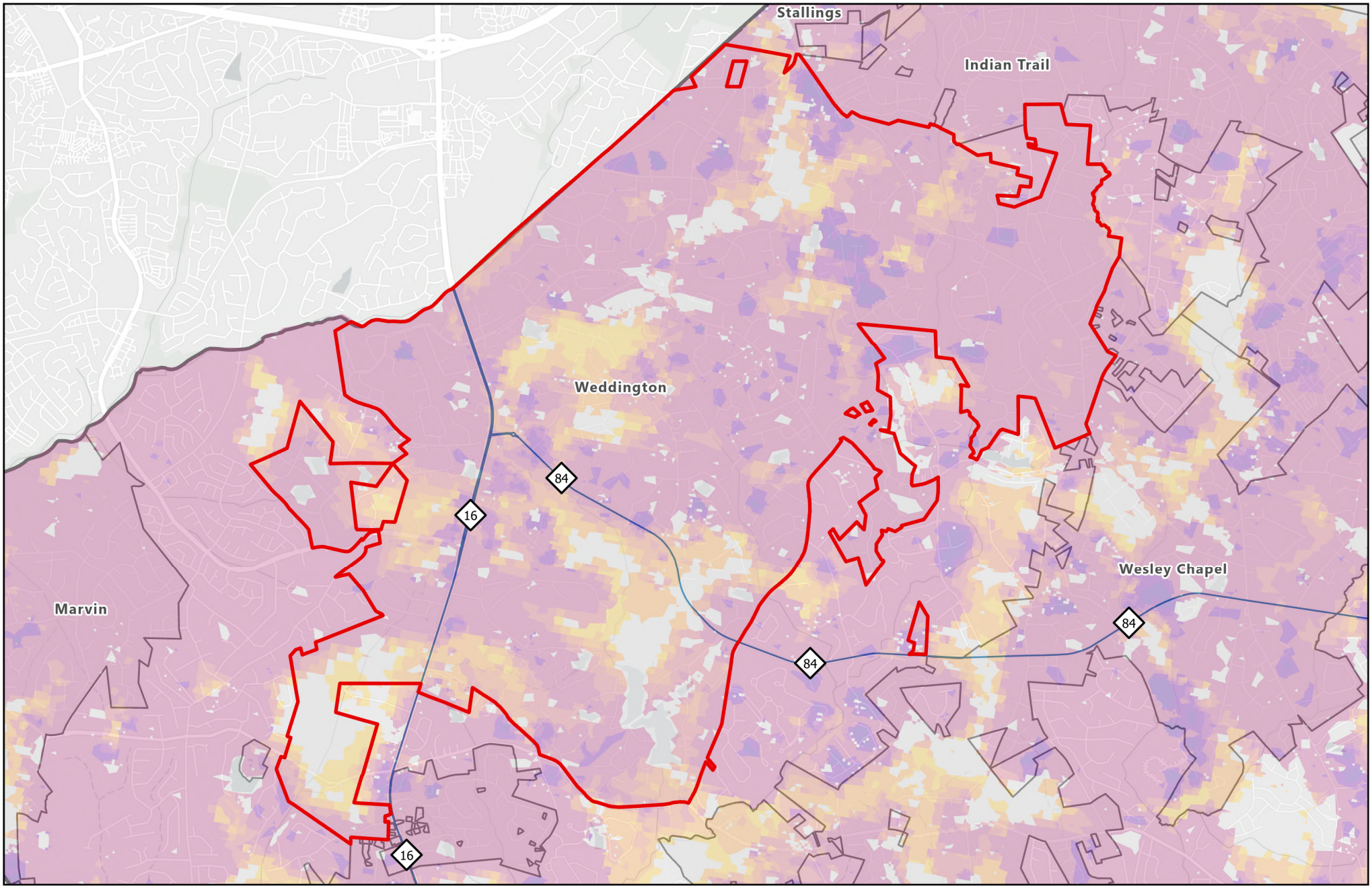
0 0.5 1 2 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

858

Weddington - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

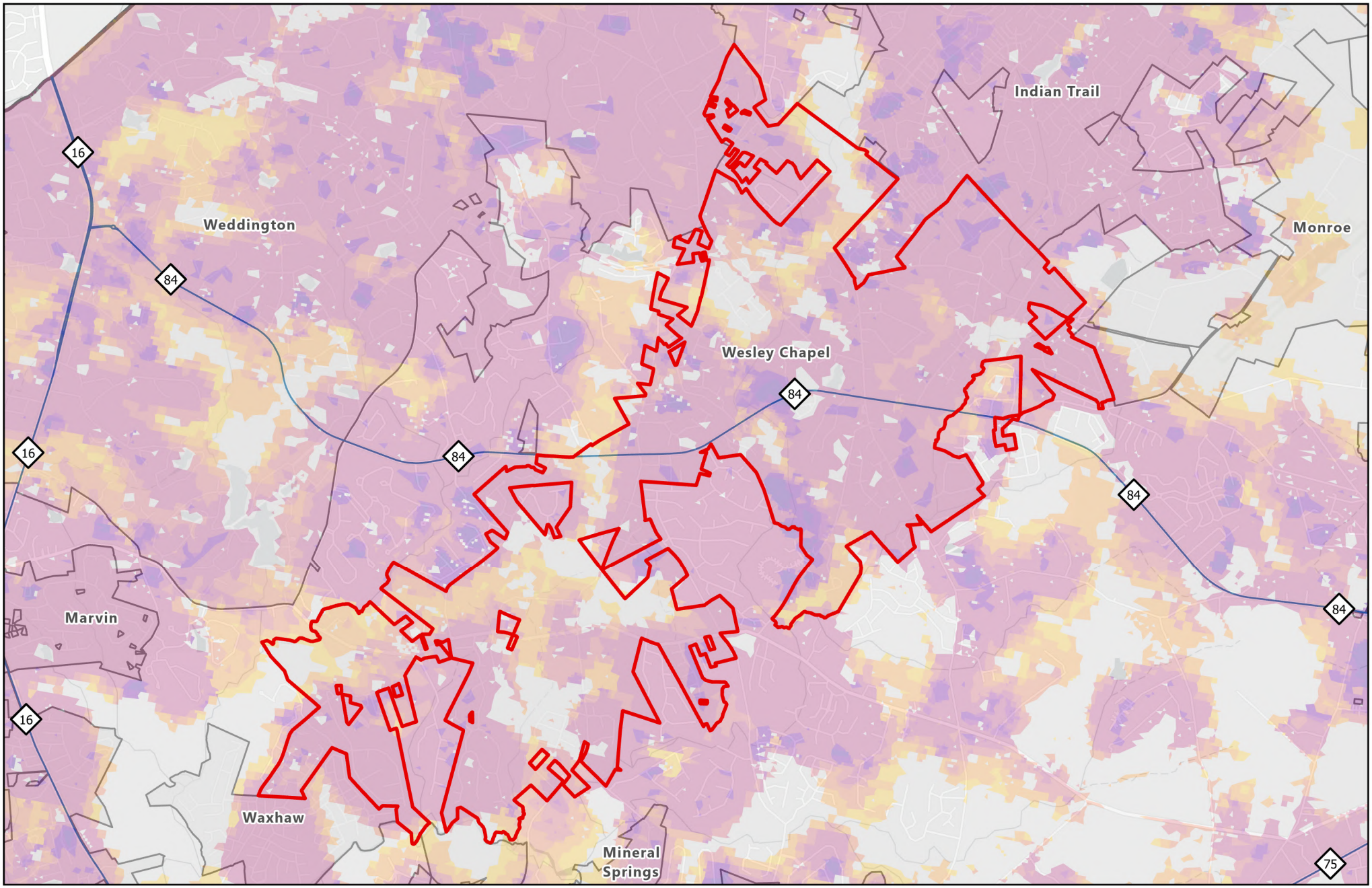
0 0.5 1 2 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

859

Wesley Chapel - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

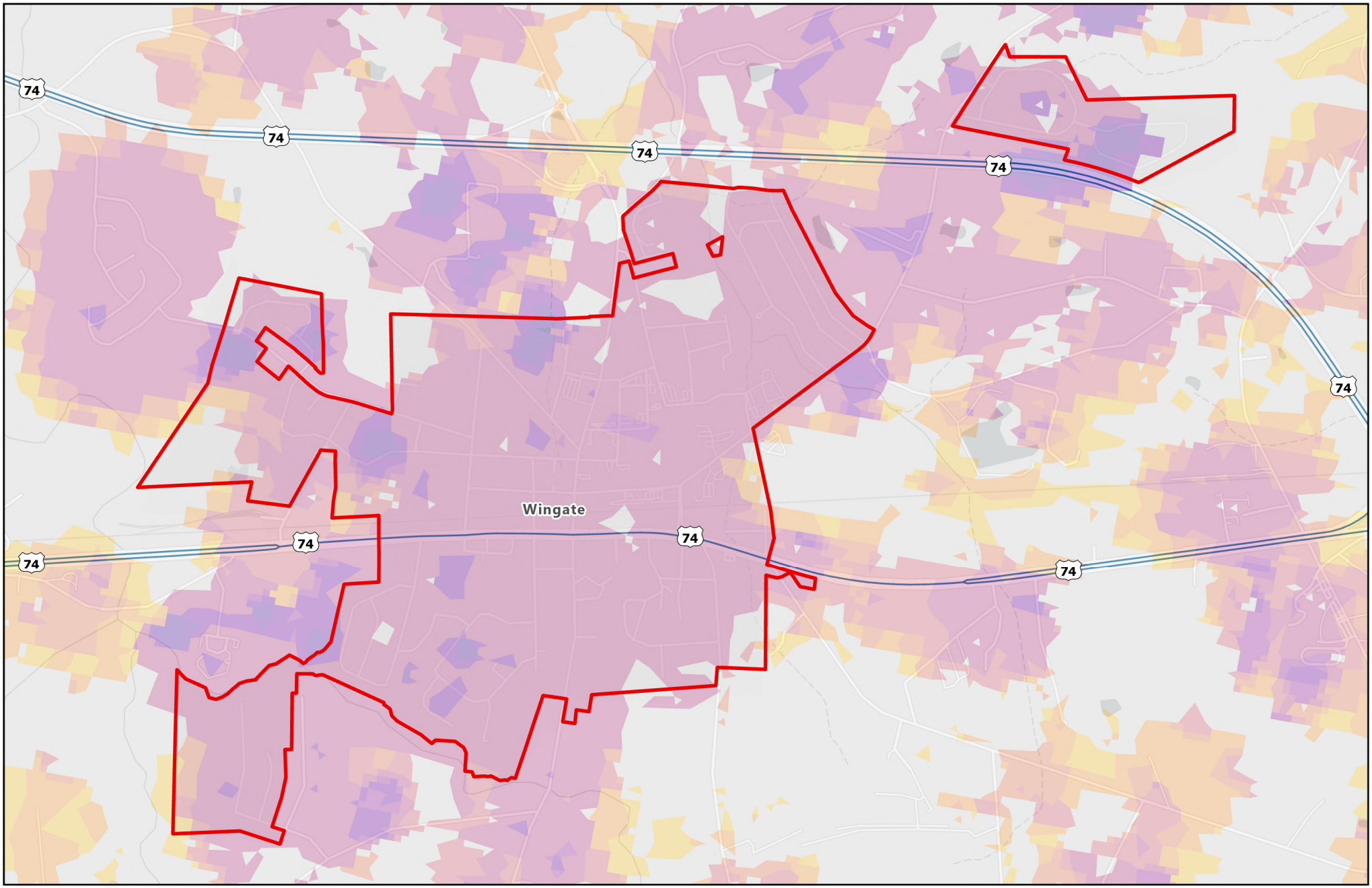
0 0.5 1 2 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

860

Wingate - Wildland Urban Interface (WUI) Risk Areas



Legend

- Major Roads
- County Boundary
- Municipal Boundaries

WUI Risk Index

0 -3 -6 -9

Low High

0 0.25 0.5 1 Miles

Data Source: Southern Wildfire Risk Assessment
Data Layer: Wildland Urban Interface (WUI) Risk Index

N

861

Appendix H:
NCEI Storm Event Data

This section of the plan includes the historic storm event data as reported to the National Centers for Environmental Information (NCEI)[1].

- H.1 – Cold/Wind Chill
- H.2 – Drought
- H.3 – Extreme Heat
- H.4 – Flood
- H.5 – Hail
- H.6 – Heavy Rain
- H.7 – Heavy Snow
- H.8 – High Wind
- H.9 – Ice Storm
- H.10 – Lightning
- H.11 – Sleet
- H.12 – Tornado
- H.13 – Thunderstorm Wind
- H.14 – Winter Storm

[1] NCEI Storm Events Database (https://www.ncdc.noaa.gov/stormevents/). Events recorded as of 2024. **Per the database disclaimer**: "*due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. NCEI has performed data reformatting and standardization of event types but has not changed any data values for locations, fatalities, injuries, damage, narratives and any other event specific information*."

TABLE H.1: COLD/WIND CHILL EVENTS (1996-2024)

Location	Date	Description
STANLY	2/3/1996	-
CABARRUS	4/1/1997	Several cold snaps following the relatively warm late winter caused temperatures to dip well into the 20s at times yielding substantial damage to the apple crop and perhaps other crops.
UNION	4/1/1997	Several cold snaps following the relatively warm late winter caused temperatures to dip well into the 20s at times yielding substantial damage to the apple crop and perhaps other crops.
CABARRUS	1/6/2014	An arctic cold front blasted through the western Carolinas during the morning of the 6th, bringing gusty winds and the coldest air mass to have affected the region since 1994. By early evening, winds of 10 to 20 mph, with stronger gusts combined with temperatures falling into the 20s and teens to produce wind chill values below 0 across the Piedmont and foothills. Although wind gradually diminished overnight, low temperatures fell into the single digits across the Piedmont and foothills. The low temperature of 6 at the Charlotte/Douglass International Airport shattered the previous daily record of 12 that had stood for more than a century.
UNION	1/6/2014	An arctic cold front blasted through the western Carolinas during the morning of the 6th, bringing gusty winds and the coldest air mass to have affected the region since 1994. By early evening, winds of 10 to 20 mph, with stronger gusts combined with temperatures falling into the 20s and teens to produce wind chill values below 0 across the Piedmont and foothills. Although wind gradually diminished overnight, low temperatures fell into the single digits across the Piedmont and foothills. The low temperature of 6 at the Charlotte/Douglass International Airport shattered the previous daily record of 12 that had stood for more than a century.
CABARRUS	1/7/2015	A strong arctic cold front moved through the western Carolinas during the morning and afternoon of the 7th, bringing gusty winds and very cold air to the Piedmont and foothills. By late evening, sustained winds of 5 to 15 mph combined with air temperatures in the teens to yield wind chill values near 0. Although winds gradually diminished overnight, air temperatures fell to around 10 degrees in many areas by daybreak, and wind chills of 0 to 5 above lingered until temperatures began warming during late morning. However, temperatures remained at or below freezing in many areas throughout the 8th. Record daily lows were set in the Charlotte area on the morning of the 8th.
CABARRUS	3/16/2017	The 2017 growing season began early across western North Carolina, due to an unusually warm February and early March that saw average temperatures of almost 10 degrees above normal. An episode of cold arctic high pressure in the middle of March led to a hard freeze on the morning of the 16th, when low temperatures in the lower to mid 20s were reported. This caused significant damage to berry, wheat, apple, and peach crops. While subsequent days of freezing temperatures caused further damage, the vast majority of the damage occurred on the 16th.
UNION	3/16/2017	The 2017 growing season began early across western North Carolina, due to an unusually warm February and early March that saw average temperatures of almost 10 degrees above normal. An episode of cold arctic high pressure in the middle of March led to a hard freeze on the morning of the 16th, when low temperatures in the lower to mid 20s were reported. This caused significant damage to berry, wheat, apple, and peach crops. While subsequent days of freezing temperatures caused further damage, the vast majority of the damage occurred on the 16th.
CABARRUS	12/23/2022	An arctic cold front swept across the foothills and Piedmont of western North Carolina during the morning of the 23rd and introduced the coldest air mass in more than 5 years. Temperatures in the single digits and lower teens combined with 10 to 20 mph

		winds to produce wind chill values in the 0 to -15 range from the evening of the 23rd through Christmas Eve morning. While winds abated throughout Christmas Eve into Christmas Day, unseasonably cold weather persisted for the better part of four days. There were numerous reports of frozen and burst pipes along with mostly minor damage to infrastructure throughout the area.

Source: NOAA, NCEI

TABLE H.2: DROUGHT EVENTS (1998-2024)

Location	Description
7/1/1998	Dry weather continued through much of the month of July, affecting crops during the critical part of the growing season. Corn and other vegetables sustained the most damage, but a dollar amount was not available at the time of this writing.
10/1/1998	The drought which began during the summer continued through October. The only significant rainfall during the month occurred on the 7-8th. Cities and counties began to restrict water usage and streamflows for several mountain locations were reduced to the lowest seen in 50 years.
11/1/1998	Dry weather persisted into the late fall with rainfall deficits between 5 and 10 inches. This affected late season crops and caused water shortages. Water usage restrictions were initiated in many communities.
7/1/1999	A long-term dry spell became a drought in July. Without any widespread rain events, the only relief came in the form of widely scattered afternoon and evening thunderstorms. But even those were few and far between. The lack of rainfall lowered water tables significantly and significant damage to crops began to occur. The North Carolina northern foothills and northwest piedmont were affected first, followed by the southern foothills and southern piedmont. Dollar amounts of the damage were unavailable at the time of this writing.
8/1/1999	The drought worsened during the month of August as high evaporation rates and little rainfall occurred. The most severe conditions by the end of the month had developed in the foothills and piedmont. Water restrictions began in several communities, and for some, the first time in memory. Hay and late crops dried up in many counties. Ponds and wells began to dry up as well, affecting homeowners, farmers, and businesses such as nurseries. In addition, boaters were running aground on recreational lakes due to low water levels.
9/1/1999	Rainfall continued to be scarce across much of western North Carolina through the month of September, prolonging the drought conditions which existed all summer. However, some areas in the piedmont picked up some rain from the remnants of Hurricane Dennis early in the month and from Hurricane Floyd itself two weeks later. Although this rain brought some relief, more wells ran dry and many more areas began mandatory water restrictions.
10/1/1999	The return of some rainfall as well as lower evaporation rates due to the change of seasons, resulted in the drought easing somewhat. Drought classifications were lowered in some cases, and some places lifted water restrictions. However, the drought had not ended by the end of the month.
8/1/2000	The 2-year drought was reaching a critical stage by late summer. Many 80 to 100-foot wells were going dry. Area lakes were at record low levels causing property damage to docks, boats, etc.
9/1/2000	Overall, drought conditions continued across western North Carolina despite some locations receiving near their month's average rainfall. Low stream flow and municipal water supply remained the largest issues with many towns and cities enacting water restrictions. Citizens were quoted as saying this is the driest, they have ever seen it. Despite the drought conditions, impact on crops seemed to be minimal.
10/1/2000	Effects of the drought intensified as many areas received absolutely no rain during the month, setting records for the longest stretch without measurable rainfall in several locations. Wells and mountain streams continued to dry up and lake levels continued to drop. Many communities were forced to start more stringent water conservation measures.
11/1/2000	The long-term drought continued to affect the region. Rainfall during the month was near or slightly above normal, but this had little effect on the ground water levels. Numerous wells dried up during the fall, and well borers and drillers could not keep up with the demand. Large lakes reported record low levels and some communities continued or initiated water control measures.
2/1/2001	The long-term drought's impact became more severe, even during the winter, as water levels in lakes dropped and stream flow on rivers reached the lowest in memory. More and more communities began water restrictions and started preparing for a busy fire weather season.
3/1/2001	Despite beneficial rain during March, the drought continued to grip most of the area. Severe water restrictions were implemented in parts of the North Carolina piedmont, where reservoir had

Location	Description
	dropped to all-time low levels. In Concord, food establishments were asked to use paper and plastic products to conserve water.
4/1/2001	Some relief to the long-term drought occurred at mid-month, but for the most part, the rainfall deficit for the three-year period actually grew larger by the end of April. Mandatory water restrictions continued at a few mountain locations, with voluntary water restrictions urged at many others. Numerous wells went dry during April.
5/1/2001	Unprecedented drought conditions continued. Some rivers and lakes reached record-low levels. Well-drilling companies in the North Carolina piedmont were recording twice as much business as usual.
8/1/2001	The effects of the long-term drought became more severe, especially in the North Carolina piedmont. Critical water conditions were beginning to concern officials and residents of Charlotte.
12/1/2001	Very little active weather during December signaled that the drought was still present - and becoming critically important to more and more people. The Charlotte area recorded an all-time record dry calendar year with just 26.23 inches of rainfall during 2001. Records have been kept in the area since 1878. Many communities initiated either mandatory or voluntary water restrictions. At Kings Mountain, NC - a new pump was required at Lake Moss because the water level dropped below 2 of the 3 existing pumps. Record low ground water supplies, lake levels, and stream flows were reported across all of Western North Carolina.
8/1/2002	The water supply situation reached crisis levels in some communities, as the effects of the long-term drought continued to plague western North Carolina. Particularly hard hit were several Piedmont communities along the Interstate 77 corridor. The city of Shelby was forced to buy water from surrounding communities and even from private companies and citizens. In Statesville, emergency construction of wells and a dam was necessary to prevent the city from running out of water, as the South Yadkin River reached historically low levels. Water levels on area lakes were as much as 10 feet below full pond. Most of the larger towns and cities along the I-77 corridor had imposed mandatory water restrictions by the end of the month, including the Charlotte metro area.
5/1/2004	A period of dry weather that began in August of 2003 resulted in moderate drought conditions across portions of western North Carolina by late spring of 2004. Streamflow and lake levels began to run below normal, and a few communities instituted water restrictions.
5/1/2007	The effects of an extended period of dry weather were exacerbated by an abnormally dry May, with many locations reporting one of the driest Mays in recorded history. By the end of May, many climatological stations were reporting yearly rainfall deficits as high as 10 inches. The result was severe to extreme drought conditions across much of western North Carolina by the end of the month. Water restrictions were implemented in some counties across extreme western North Carolina. The very dry conditions added to agriculture hardships caused by a hard freeze and widespread damaging winds in April.
6/1/2007	Despite an increase in thunderstorm activity, drought conditions persisted across much of western North Carolina. The persistent drought continued to cause hardships to agricultural interests that were still recuperating from the April freeze. Dollar values for the drought damage should be included in either the August or September Storm Data for this region.
7/1/2007	Drought conditions persisted across much of western North Carolina during July. By the end of July, voluntary water restrictions were instituted in almost all North Carolina counties along and west of I-77. Some mandatory restrictions were introduced in Union County, NC. Agricultural interests continued to be especially hard hit. The absence of rain negatively affected the hay crop, creating concern for the loss of livestock. Dollar values for the drought damage should be included in either the August or September Storm Data for this region.
8/1/2007	Severe to extreme drought conditions persisted across much of western North Carolina during August. By the end of the month, voluntary water restrictions continued in almost all North Carolina counties along and west of I-77. Stream flows and groundwater levels approached record low levels. Water levels on some reservoirs decreased by as much as 1 foot every 10 days. Agricultural interests continued to be especially hard hit, and the North Carolina governor requested federal disaster aid

Location	Description
	by the end of the month. Dollar values for the drought should be included in either the September or October Storm Data for this region.
9/1/2007	Extreme drought conditions persisted across western North Carolina through September, as the region experienced another month of well-below normal precipitation. By the end of the month, most locations were running a yearly rainfall deficit of 11-17 inches. Stream flows and groundwater levels were near record low levels, with many streams running at 5 percent or less of normal flow. Water levels on area reservoirs were some of the lowest in recorded history. Agricultural interests continued to be especially hard hit. Farmers continued to struggle to feed livestock due to a lack of hay and poor pasture conditions, forcing many cattle to be sold or slaughtered. Agricultural and other losses attributed to the drought are estimated to be in the hundreds of millions of dollars. County-based losses for the growing season will be included in next month's Storm Data.
10/1/2007	Unusually dry weather continued across western North Carolina through October. Although a soaking rain near the end of the month resulted in near-normal monthly precipitation for the mountains, the piedmont saw another month of well-below normal rainfall. Most areas were on pace to break yearly rainfall deficit records. By the end of the month, exceptional drought conditions were reported across the majority of the area. Water flow on area streams continued at 3 to 6 percent of normal, while lake levels remained at near-record lows. Although most cities and towns were requesting voluntary water restrictions be observed, mandatory restrictions were ordered in quite a few communities. In some areas, the water situation was becoming dire, with Monroe, NC officials reporting that water supplies would be exhausted by early 2008 if significant rain did not occur. Also, private wells were beginning to dry up in many areas. Agriculture continued to be severely impacted by the drought. As of this writing, county by county dollar estimates of drought damage have not been made available.
11/1/2007	November provided no relief from the effects of the long-term drought. In fact, another month of well-below normal rainfall made an already dire situation even worse. Many locations remained on pace to set annual records for rainfall deficit. By the end of the month, the vast majority of the region was experiencing exceptional drought conditions. Streamflow on area rivers remained extremely low, generally less than 10 percent of normal. Meanwhile, lakes continued to gradually fall toward record low levels.
12/1/2007	The latter half of December saw a transition to a wetter pattern across the southeast. Most observing stations in western North Carolina reported above normal monthly rainfall for the first time since January 2007. However, this was not enough to put much of a dent in the long-term drought as extreme to exceptional drought conditions persisted into the New Year. Although the increase in rainfall did allow for some recharge of area streams, many were still running at less than 25 percent of normal flow at the end of the month.
1/1/2008	January saw a return to dry weather across western North Carolina. Most observing stations across the region reported a rainfall deficit of 1 to 2 inches during the month, resulting in another month of exceptional drought conditions across most of the area. Water levels on area lakes remained within a foot or two of record low stages. However, rivers and streams remained somewhat recharged from the December rains, with streamflow on most waterways running 25 to 75 percent of normal.
6/1/2008	Although near normal rainfall was observed across much of the area during the late winter and early spring, another period of abnormally dry weather in May and June exacerbated severe to extreme drought conditions over the western Carolinas and northeast Georgia. Much of the area saw less than 2 inches of rain during this period of time. By the end of the month, much of the mountains and foothills of western North Carolina were running 10 inches below normal annual rainfall. Total rainfall deficits since the beginning of 2007 were around 20 inches or more in the hardest hit areas. By the end of the month, flow on almost all major streams was running less than 10 percent of normal. Many area crops suffered.
7/1/2008	Unusually dry weather continued through the month of July, with severe to extreme drought conditions persisting across the area. Afternoon and evening thunderstorms provided some degree of relief across portions of the North Carolina piedmont, but locations across Upstate South Carolina

Location	Description
	and extreme western North Carolina reported annual rainfall deficits of nearly 11 inches by the end of the month. Mandatory water restrictions were instituted across much of the North Carolina foothills. Water well levels began to descend below record low levels, most of which were recorded during the 1999-2002 drought. The vast majority of major streams across the area continued to run 1-10 percent of normal flow. Agriculture continued to be hard hit, with some areas reporting a 100 percent loss of the corn crop.
8/1/2008	Dry weather persisted across much of the area for most of August, although portions of the North Carolina Piedmont began to see relief from the dry conditions early in the month, due to an increase in daily thunderstorm activity. Elsewhere, exceptional drought conditions persisted and even expanded slightly westward to cover more of far western North Carolina and northeast Georgia. During the early part of the month, flows on most of the major streams across the area were running at record low levels, with the French Broad River setting a minimum flow record that had stood for almost 100 years. Only a handful of streams were running at more than 1 to 7 percent of normal. Groundwater levels were 2-5 feet below normal. Significant agricultural impacts persisted, with losses to summer crops, including hay, estimated at 30%. The dry weather also affected the livestock industry, due to shortages of pasture crops necessary for feeding. By the end of the month, Tropical Storm Fay had dropped up to 11 inches of rainfall across the area, providing some relief from the drought conditions, especially across the North Carolina Piedmont.
9/1/2008	The heavy rain brought by Tropical Storm Fay in late August provided some relief to the drought conditions across the area. This was particularly true across the North Carolina piedmont, where improving conditions were aided by normal September rainfall. However, another dry month resulted in a persistence of extreme to exceptional drought conditions across the North Carolina mountains and foothills. Voluntary water restrictions remained widespread during the month. A few communities held onto mandatory restrictions early in the month, but many of these were lifted by the end of the month. Well water remained near record low levels in many areas, while lake levels persisted well below normal stages. Rainfall from Fay resulted in some improvement in streamflows, although most rivers and major streams remained at less than 25 percent of normal, with many still running at less than 10 percent of normal. By the end of the month, government officials had requested a federal disaster declaration for most of the counties in the area, due to crop damages.

TABLE H.3: EXTREME HEAT EVENTS (1998-2024)

Date	Location
7/22/1998	Excessive heat plagued central North Carolina during July 22 through July 23. Maximum temperatures reached the 98 to 103-degree range combined with dew points in the 78 to 80-degree range with little wind to give heat index values of around 110 degrees for several hours each afternoon. To make matters worse, the minimum temperatures did not fall below 80 at several locations and those that did achieved that feat for only an hour or two. Strong thunderstorms ended the 2-day excessive heat ordeal on the evening of the 23 when rain cooled the environment enough to send temperatures into the lower 70s at most locations.
6/29/2012	A very hot and humid airmass that spent several days building west of the Appalachians finally made it east of the mountains, bringing very hot conditions to foothills and Piedmont of North Carolina. The high temperature at Charlotte-Douglas International Airport hit 104 degrees on both the 29th and 30th, tying the all-time high. The heat index hit 105 degrees. Excessive heat affected areas east of Charlotte. The ASOS at Monroe, NC reported a heat index value of 110 degrees on 30th. Lower dewpoints over the foothills resulted in sub-advisory and warning level heat index values. The heat lasted through July 1st, before thunderstorms brought somewhat cooler conditions.
6/29/2012	A very hot and humid airmass that spent several days building west of the Appalachians finally made it east of the mountains, bringing very hot conditions to foothills and Piedmont of North Carolina. The high temperature at Charlotte-Douglas International Airport hit 104 degrees on both the 29th and 30th, tying the all-time high. The heat index hit 105 degrees. Excessive heat affected areas east of Charlotte. The ASOS at Monroe, NC reported a heat index value of 110 degrees on 30th. Lower dewpoints over the foothills resulted in sub-advisory and warning level heat index values. The heat lasted through July 1st, before thunderstorms brought somewhat cooler conditions.
7/1/2012	Oppressive heat continued the first day of July, with Charlotte-Douglas International Airport tying its all-time record high temperature of 104 degrees for a 3rd consecutive day. The ASOS at Monroe reported a high temperature of 105 degrees with a max heat index of at least 111 degrees. Once again, Hickory in the foothills failed to reach even heat advisory criteria. Widespread thunderstorms developed during the afternoon hours, bringing a few days of relief from the heat.
7/1/2012	Oppressive heat continued the first day of July, with Charlotte-Douglas International Airport tying its all-time record high temperature of 104 degrees for a 3rd consecutive day. The ASOS at Monroe reported a high temperature of 105 degrees with a max heat index of at least 111 degrees. Once again, Hickory in the foothills failed to reach even heat advisory criteria. Widespread thunderstorms developed during the afternoon hours, bringing a few days of relief from the heat.
7/8/2012	Hot and humid conditions affected parts of the North Carolina Piedmont during the day. The high temperature at the Monroe ASOS was 100 degrees, with a heat index as high as 109 degrees. At Charlotte-Douglas International Airport the high was 101 and the heat index rose to 108 degrees.
7/8/2012	Hot and humid conditions affected parts of the North Carolina Piedmont during the day. The high temperature at the Monroe ASOS was 100 degrees, with a heat index as high as 109 degrees. At Charlotte-Douglas International Airport the high was 101 and the heat index rose to 108 degrees.

TABLE H.4: FLOOD EVENTS (1996-2024)

Location	Date	Description
Cabarrus County		
Cabarrus County	1/23/2002	Persistent overnight and morning rainfall resulted in the flooding of a couple of roads. One was northeast of Concord, and another southeast of Mt. Pleasant.
Cabarrus County	3/20/2003	After morning flash flooding, moderating rainfall contributed to slower rises, but continued and additional flooding along numerous creeks and streams into the evening hours. Flooding was quite severe from Kannapolis to Concord, as well as across southern and eastern sections of the county. A nursing home and a school had to be evacuated due to rising water. At least 10 roads were closed across the county.
Cabarrus County	4/10/2003	After a night of moderate to heavy rainfall, flooding developed during the morning along some creeks and streams between Kannapolis and Concord, causing several roads to be closed. Water levels on the Rocky River increased to 20 feet above normal. Significant flooding also occurred along the Irish Buffalo Creek. In some areas, boats were required to ferry people to and from work.
Cabarrus County	4/18/2003	Persistent heavy rainfall resulted in slow rises and eventual flooding in the southern part of the county. Several fields were flooded, and 12 roads were closed.
Cabarrus County	5/22/2003	Persistent heavy rainfall resulted in slow rises along creeks and streams, which culminated in flooding that lasted for much of the day. Flooding began during the morning near Harrisburg, where a bridge and a road were flooded. Flooding slowly worsened through the afternoon and expanded to areas from Harrisburg to Midland, and from Kannapolis to Concord.
Cabarrus County	5/25/2003	Slow rises along creeks and streams culminated in a few flooded roads in the Harrisburg and Mt Pleasant areas.
Cabarrus County	9/8/2004	After earlier flash flooding, general flooding continued through the early afternoon. The Rocky River continued to be the main stream affected, but gradual rises eventually culminated in flooding along additional streams as well.
Cabarrus County	9/28/2004	Although moderating rainfall rates resulted in more gradual rises along creeks and streams, flooding expanded and became widespread later in the morning. By mid-morning, numerous roads were closed. A school in Cabarrus County was evacuated when it was threatened by rising water. In Rowan County, several motorists had to be rescued after driving their vehicles through flood water.
Cabarrus County	6/2/2005	Flooding first began along several creeks in the Midland area, including Clear, Muddy, and Little Meadow, as well as some small tributaries of the Rocky River. Later in the morning, the Rocky River flooded in the northwest part of the county, near Poplar Tent Rd. Several roads were closed due to high water, including Hopewell Church Rd, where several homes were surrounded by high water.
Cabarrus County	7/4/2005	Heavy rain falling over Rowan County produced flooding along Irish Buffalo Creek near Kannapolis. This required evacuation of around 70 people from a nursing home and a mobile home park.
COUNTYWIDE	9/1/2000	Heavy rain from slow-moving thunderstorms caused a considerable amount of standing water and minor flooding on secondary roads.
CONCORD	7/22/2002	A few streets were flooded.
COUNTYWIDE	12/15/2005	Flooding developed after an extended period of moderate to heavy rain. Approximately 7 roads were closed due to high water conditions.

Location	Date	Description
CONCORD	11/22/2006	Flooding developed along portions of the Rocky River, some of its tributaries, and along other streams, including Back Creek when 4 to 5 inches of rain fell in about an 18 hour period. Several roads were closed, including Mt Pleasant Rd, Pharr Mill Rd, and Stallings Rd, and highway 200 in Harrisburg.
KANNAPOLIS	8/27/2008	Although flash flooding ended across the area by mid-morning, stream levels remained elevated, and in some cases continued to slowly rise into the afternoon hours. In fact, the South Fork River did not crest until mid-evening. Numerous roads remained closed through the day.
GLASS	7/22/2009	Although heavy rain ended, water levels remained high from the city limits of Concord southwest to Stough Rd for several hours during the early morning.
ROBERTA MILLS	11/11/2009	Flooding continued along portions of Back Creek and the Rocky Broad River into the evening hours. Total rainfall amounts of 4-5 inches occurred, mostly within a 24-hour period.
ROBERTA MILLS	1/26/2010	Although heavy rainfall ended over the county during the early morning hours, runoff from the rainfall caused high water conditions to persist until after sunrise. The main stream affected was the Rocky River, which went well above itï¿½ï¿½ï¿½s established flood stage.
ROBERTA MILLS	2/5/2010	A gauge on The Rocky River exceeded established flood stage above Irish Buffalo|Creek, indicating flooding of Pharr Mill Rd and Mount Pleasant Rd.
HARRISBURG	12/23/2013	The Rocky River went into flood during the afternoon hours of the 23rd after widespread rainfall of around 3 inches fell over the headwaters of the river. Several roads were flooded along the Rocky River, including Stallings Road, Pharr Mill Road and Mt Pleasant Road. Back Creek also flooded a road near the intersection of Robinson Church and Stallings Roads near Middleton and Rocky Meadows Subdivisions.
ROCKY RIVER	3/7/2014	Emergency Manager reported flooding of Stallings Rd and Pharr Mill Rd.
MT PLEASANT ARPT	3/7/2014	Emergency Manager reported multiple roads flooded across the exreme eastern portion of Cabarrus County, particularly in the Midland and Mount Pleasant areas.
ROCKY RIVER	10/3/2015	Although rain began to taper off by late-morning, runoff from earlier rainfall resulted in a stream gauge on the Rocky River exceeding flood stage during late morning, indicating that Back Creek was likely flooding Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	11/2/2015	County comms and stream gauges reported flooding developed across mainly the southern part of the county, after about 3 inches of rain fell in a 36-hour period, with most of that falling during the morning of the 2nd. Water from the Rocky River backed into Back Creek, flooding Stallings Rd, Pharr Mill Rd, and Rocky River Rd in Harrisburg. Other closed roads included Bethel Ave Exd, Hopewell Church Rd, and Pine Bluff Rd, all in Midland.
ROCKY RIVER	11/10/2015	After more than two inches of rain fell across much of Cabarrus County in about 24 hours, a stream gauge on the Rocky River near Irish Buffalo Creek exceeded the established flood stage, eventually by more than a foot. This indicated water backing into Back Creek from the Rocky River was causing flooding of Stallings Rd and Pharr Mill Rd, and that the Rocky River was likely flooding Poplar Tent Rd.
ROCKY RIVER	12/23/2015	After 2.5 to 4 inches of rain fell over Cabarrus County in about 2 days, a stream gauge on the Rocky River exceeded established flood stage during the late evening of the 23rd, and remained there through the morning of the 24th. High water backing into Back Creek resulted in flooding of Pharr Mill Rd as well as Stallings Rd.

Location	Date	Description
ROBERTA MILLS	12/30/2015	Although heavy rain tapered off across Cabarrus County by late afternoon, runoff from the earlier heavy rainfall, along with the occasional moderate to heavy rain shower, resulted in only slow recession of flood water into the evening hours.
MIDLAND	12/30/2015	While flood waters receded across much of Cabarrus County, continued runoff resulted in persistent flooding along the Rocky River and some of its tributaries through the morning of the 31st. Affected roads included Pharr Mill, Stallings, Hopewell Church, Bowman Barrier, Cox Mill Roads and portions of Highway 200.
ROCKY RIVER	4/24/2017	Gradual stream rises developing as a result of 4 to 6 inches of rain falling over about a 48-hour period resulted in flooding of streams and roads across Cabarrus County during the morning of the 24th and continuing through much of the day. The main streams impacted were tributaries of the Rocky River, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek.
ROCKY RIVER	9/16/2018	Although heavy rain ended across Cabarrus County during the evening flooding continued along the Rocky River and its tributaries through daybreak.
ROCKY RIVER	10/11/2018	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall of around 2 inches fell within the basin throughout the morning of the 11th. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	11/13/2018	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall of around 2 inches occurred within the basin over a period of several hours. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	11/15/2018	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall 1 to 2 inches fell within the basin, which was already saturated due to an extended period of wet weather. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	12/20/2018	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall of around 2 inches fell within the basin in about 24 hours. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	2/22/2019	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall of around 2 inches fell within the basin in about 24 hours. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	2/6/2020	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed mainly along tributaries of the river including Back Creek Irish Buffalo Creek and Dutch Buffalo Creek after 2 to 4 inches of rain fell across Cabarrus County in around 24 hours. Multiple roads were inundated including Stallings Rd Poplar Tent Rd Bowman-Berrier Rd Mount Pleasant Rd and Highway 200.
ROCKY RIVER	4/30/2020	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed, mainly along tributaries of the river, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek after 2 to 3.5 inches of rain fell across the basin in just a few hours. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Mount Pleasant Rd, and Highway 200. An 82-year-old man drowned in his vehicle after driving around a barrier where Miami Church Road crossed Dutch Buffalo Creek.

Location	Date	Description
ROCKY RIVER	5/20/2020	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed, mainly along tributaries of the river, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek after 2 to 3 inches of rain fell across Cabarrus County in around 36 hours. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Mount Pleasant Rd, and Highway 200. Periods of continues showers and thunderstorms that continued into the 21st resulted in the streams remaining above flood stage for more than 24 hours.
ROCKY RIVER	5/27/2020	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed, mainly along tributaries of the river, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek after 2 to 2.5 inches of rain fell across Cabarrus County in around 12 hours. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Mount Pleasant Rd, and Highway 200.
ROCKY RIVER	11/12/2020	Although heavy rain tapered off across Cabarrus County throughout the afternoon into the evening, runoff from the earlier rainfall maintained elevated stream levels which continued to flood roads throughout the overnight hours.
ROCKY RIVER	4/8/2023	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed, mainly along tributaries of the river, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek after 2.5 to 3.5 inches of rain fell across Cabarrus County in around 36 hours. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Mount Pleasant Rd, and Highway 200.
KANNAPOLIS	6/20/2023	Emergency manager reported flash flooding developed in the city of Kannapolis after 4 to 5 inches of rain fell in just a few hours. Irish Buffalo Creek overflowed its banks on the west side of the city and inundated Pine St and Tiffany Dr. Around thirty people were evacuated from multiple mobile homes in this area and several of the homes were inundated and damaged.
ROCKY RIVER	1/9/2024	Although heavy rain tapered off across Cabarrus County throughout the evening, runoff from the earlier rainfall maintained elevated stream levels along tributaries of the Rock River which continued to flood roads throughout the overnight hours.
BARRIERS MILL	8/8/2024	Stream gauges on the Rocky River above Irish Buffalo Creek and on Coddle Creek indicated flash flooding developed along tributaries of the river, including Irish Buffalo Creek and Dutch Buffalo Creek after 4.5 to 6 inches of rain fell across Cabarrus County in association with the remnants of Tropical Storm Debby. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Hopewell Church Rd, Mount Pleasant Rd, and Highway 200. In addition, Trinity Church Rd was closed after Afton Run overflowed its banks and Wolf Meadow Branch overflowed onto the Bridge on Stough Rd.
GLASS	9/27/2024	River gauges and emergency management reported flash flooding developed across portions of Cabarrus County after 3 to 6 inches of rain fell across the county over two days, with 1 to 2 inches of that falling in less than three hours on the morning of the 27th. The main impacts were to the Rocky River and especially its tributaries. The Rocky River inundated several roads throughout the western and southern part of the county, including Shiloh Church Rd and Mount Pleasant Rd. In addition, Wolf Meadow Branch inundated Stough Rd, Back Creek flooded Stallings Rd, Dutch Buffalo Creek overflowed onto Bowman-Barrier Rd, and Muddy Creek inundated Hopewell Church Rd in Midland.

Location	Date	Description
Stanly County		
Stanly County	1/6/1998	River Flooding began on the Rocky River at Norwood during the evening and continued for 2 days. The crest at Norwood was 17.1 feet or 2.1 feet above the flood stage of 15 feet. Heavy rain during the afternoon and evening in the Rocky River basin produced the flooding that affected mainly farmland adjacent to the river.
Stanly County	1/27/1998	A soaking rain fell over central North Carolina during January 27 into the early afternoon hours of January 28th. The rain became heavy in many locations during the 28th. Flooding caused many rural county roads to become impassable and many had to be closed. In addition to the rapid rises in streams and creeks in these counties, river flooding was well underway due to the excessive rainfall for the month of January. Continuous storm systems brought heavy precipitation to central North Carolina during the month, with a major storm ending the month with flooding and river flooding.
Stanly County	2/17/1998	The Rocky River at Norwood crested at 7.0 feet above flood stage during February 17th.
Stanly County	3/20/2003	Persistent heavy rain brought widespread flooding across central North Carolina, beginning in the morning of March 20 and continuing into the afternoon. Numerous roads across the area had to be closed due to flooding, and numerous creeks overflowed their banks. Rainfall amounts were mainly between 2 and 4 inches in less than 12 hours. The heaviest rain fell in Forsyth County, where major flooding occurred along Muddy Creek, Mill Creek, and Grassy Creek, and several water rescues were needed.
Stanly County	4/10/2003	Persistent showers and thunderstorms produced heavy rain and flooding across the Piedmont of North Carolina. Several creeks and streams overflowed their banks, leading to road flooding and numerous road closures. Some basements of homes were flooded in Guilford County, and a water rescue was made in Moore County.
MISENHEIMER	2/5/2010	Heavy rain resulted in widespread minor flooding across the county. Several roads were closed due to flooding including Matton Grove Road at Wesley Chaple road, Mountain View Church Road and East Park Road. Hill Ford Bridge at Hill View Road was also under water.
STANFIELD	3/7/2014	Multiple roads flooded in the county.
NORWOOD	9/17/2018	Heavy rainfall of 6 to 8 inches caused widespread flooding across the county. Combined with additional rainfall upstream, the rainfall caused all-time record major flooding along the Rocky River near Norwood. Flooding damaged approximately 142 structures throughout the county, destroying 3 and resulting in over $3.63 million in property damage and at least $20 million in crop damage. Numerous roads were flooded all throughout the county. The Rocky River overflowed the Highway 52 bridge and reached the base of the Plank Road bridge.
ALBEMARLE	10/11/2018	Highway 52 closed due to flooding between the Highway 24/27 and the NE Connector.
OAKBORO	8/23/2019	Flash flooding caused flooded roads at Buster Road at Drye Hill Road.
RED CROSS	5/21/2020	Approximately 50 roads across the county were reported flooded due to heavy rain, with at least 3 water rescues.
ALBEMARLE	6/11/2020	A water rescue resulted from a stranded vehicle in flood waters at North 2nd Street and Main Street.

Location	Date	Description
HILLS	8/31/2020	Multiple roads were reported flooded west of Albemarle, including Highway 73 near Hartley Farm Road and at the intersection of Canton Road at Rutherford Road.
OAKBORO	11/12/2020	Flash flooding was reported at the intersection of Highway 138 and Hazard Road.
OAKBORO	6/16/2022	The intersection of North Carolina Highway 138 and Barbees Grove Road was flooded.
ALBEMARLE ARPT	8/27/2023	Flooding was reported on East Main Street near Leonard Avenue.
ALBEMARLE	8/29/2023	A road was closed due to flooding near Second Street and Franklin Street.
OAKBORO	9/27/2024	Hills Ford Road near Hills View Road was closed due to flooding.
Union County		
Union County	1/27/1996	Prolonged rain became heavier following the ice. the rain increased into the night when some thunderstorms moved in from the west. Rainfall became excessive, more than 3 and 4 inches in some cases, causing flooding to begin by mid evening. At Asheville the flooding caused a wall to collapse onto several parked cars causing extensive damage. Numerous roads were closed around the mountains and foothills. Several major rivers flooded including the French Broad and the Oconoluftee. Evacuations were required in several counties because of flooding. In this event the flooding was not severe in the northern mountains.
Union County	8/31/2002	Pebble Creek overflowed its banks, flooding a golf course in the northwest part of the county. Many roads were also flooded.
Union County	10/13/2002	Heavy morning rainfall resulted in flooding in at least one subdivision. A retention pond overflowed in Savannah Hills, resulting in flooding of roads in the neighborhood.
Union County	3/6/2003	A number of small streams and roads flooded throughout the county.
Union County	3/20/2003	After early morning rain caused flash flooding across the area, moderating rainfall resulted in slower rises, but continued and additional flooding along creeks and streams. Numerous roads flooded, and several motorists were stranded due to high water.
Union County	4/10/2003	After a night of moderate to heavy rainfall, some overflowing creeks began flooding adjacent roads and low bridges. The flooding gradually worsened throughout the day and evening.
Union County	9/28/2004	After earlier flash flooding, moderating rain rates led to more gradual rises along creeks and streams, but general flooding continued. Numerous small streams and low-lying areas remained flooded through late morning.
Union County	6/2/2005	After a night of moderate to heavy rain, flooding developed along some creeks in the northern part of the county during the morning. The first stream that flooded was Goose Creek, which flooded near the intersection of highways 601 and 218. Flooding from the South Fork of Crooked Creek later threatened a home on station road. Several roads were closed because of high water, including Goldmine, Mill Grove, and Matthew-Weddington roads.
MONROE	7/24/1999	Clusters of slow-moving thunderstorms developed during the afternoon on another hot and humid summer day. Some of the storms became severe, producing large hail the size of nickels and quarters, and straight-line winds which downed numerous trees. In Kannapolis, the roof of a commercial building was blown off. The Gastonia area experienced a severe thunderstorm which lasted nearly an hour. Numerous trees and power lines were downed, some of which fell on a trailer and homes. Urban flooding in normally flood-prone areas stranded a few cars and lightning strikes caused several house

Location	Date	Description
		fires. In rural areas around Monroe, small streams briefly came out of their banks and flooded typical flood-prone areas.
COUNTYWIDE	6/23/2006	High water conditions continued for several hours after flash flooding ended, as moderate to occasionally heavy rainfall continued across the county. A motorist drove into high water on East Sandy Springs and required rescue. This prompted the county to close 6 roads in the area.
MONROE	11/22/2006	Numerous roads and bridges flooded when 4 to 6 inches of rain fell in about an 18-hour period. Poor drainage and stream flooding were involved, as Twelvemile Creek, Crooked Creek, Stewarts Creek, Bearskin Creek, and several other streams overflowed their banks. Two men had to be rescued when their car was swept off of Ridge Rd by flood water from Crooked Creek.
INDIAN TRAIL ARPT	3/1/2009	Quite a few roads were closed due to flood water across central and northern portions of the county. Some flooding was the result of overflowing streams, while some was caused by poor drainage. Affected roads included but were not limited to Macedonia Church Rd, Antioch Church Rd at Highview Rd, Howey Bottoms Rd at Duncan Rd, and Jackson and Benton Streets in the city of Monroe.
FAIRVIEW	2/5/2010	A stream gauge along Goose Creek indicated the stream briefly exceeded established flood stage, flooding a few roads in locations near the junction of highway 218 and highway 601.
FAIRVIEW	7/12/2010	Flooding continued in the Goose Creek Basin through the evening, and progressed downstream to Fairview, where additional flooding developed near the highway 218 and 601 junction.
INDIAN TRAIL ARPT	7/15/2014	Although heavy rainfall ended across northern Union County by 9 pm, flooding continued in the Goose Creek basin, as excessive runoff continued to work its way downstream, with a stream gauge near Fairview eventually exceeding the established flood stage after 1 AM on the 16th.
INDIAN TRAIL ARPT	8/18/2015	Although heavy rain ended in the Crooked Creek basin by late evening of the 18th, the stream remained out of its banks until well after midnight, flooding several roads, especially at Ridge Rd, which was actually covered in water until daybreak of the 19th.
FAIRVIEW	8/19/2015	Although heavy rain ended in the Goose Creek basin by mid-evening of the 19th, continued runoff resulted in the stream remaining out of its banks and flooding several roads, including the intersection of Highways 218 and 601, until well after midnight.
WESLEY CHAPEL	11/2/2015	County comms and emergency manager reported flooding developed across the central part of the county during the afternoon, after more than 3.5 inches of rain fell in about a 36-hour period, with much of that falling during the morning and early afternoon of the 2nd. The main streams involved included tributaries of Twelvemile Creek, which flooded multiple roads, including Shannon Rd between Mineral Springs and Weddington. Many homes along Shannon Rd were cut off from passable roads by early evening. Public reported portions of Griffin Memorial Park flooded by Bearskin Creek. A small stream feeding into Lake Lee flooded a bridge. Portions of Stack Rd in Monroe and Potter Rd in Waxhaw were also closed due to high water.
WEDDINGTON	11/19/2015	After more than 2.5 inches of rain fell across much of Union County in about 24 hours, county comms reported flooding developed, especially across the western part of the county. Flooded roads included Antioch Church Rd in Weddington, Shannon Rd, Bigham Rd, and Billy Howell Rd in Waxhaw, and Trinity Church Rd and Medlin Rd near the South Carolina border.

Location	Date	Description
INDIAN TRAIL	12/22/2015	County comms reported quite a bit of flooding developed, mainly across the northwest part of the county after around 2 inches of rain fell in about a 12-hour period. The main streams affected included South Fork Crooked and Twelvemile Creek and tributaries. Crooked Creek flooded portions of Sardis Church Rd, Lawyers Rd, and Friendly Baptist Church Rd. Additional roads flooded included Shannon Rd (due to flooding of Little Twelvemile Creek), Austin Chaney Rd, and multiple roads off Highway 74 in the Indian Trail area.
FAIRVIEW	12/30/2015	Although heavy rainfall tapered off across Union County by early evening, continued runoff from the earlier heavy rainfall resulted in only slow recession of flood water through the evening hours.
INDIAN TRAIL ARPT	4/24/2017	Public reported the South Fork of Crooked Creek overflowed its banks and flooded a portion of Lawyers Rd.
OLIVE BRANCH	9/16/2018	Although heavy rain ended across Union County during the evening, EM reported high water conditions continued through the overnight, as waters were slow to recede in light of the 7 to 13 inches that fell across the county in about 24 hours. During the morning of the 17th, an 88-year-old man drowned when he drove his vehicle through a swollen tributary on Landsford Dr.
INDIAN TRAIL ARPT	2/6/2020	Although heavy rainfall tapered off across Union County into the evening, runoff from the earlier rainfall resulted in high water conditions persisted, with multiple roads remaining closed through late evening.
MARVIN	11/12/2020	Emergency manager reported flash flooding developed along creeks and small streams and in urban areas after 2 to 3 inches of rain fell, mostly in around three hours during the morning of the 12th. Multiple roads were closed and at least two motorists required rescue from stranded vehicles.
INDIAN TRAIL ARPT	7/19/2022	Stream gauges indicated Goose Creek exceeded its established flood stage after 2.5 to 3.5 inches of rain fell in the headwaters in just a couple of hours. Stevens Mill Rd along with a few other roads were inundated in the Indian Trail area.
WESLEY CHAPEL	9/9/2023	Several sources reported flash flooding developed across northwest Union County after 3 to 5 inches of rain fell in just a couple of hours from a nearly stalled thunderstorm cluster. Chinkapin Creek overflowed its banks in the Unionville area. Multiple roads were inundated in the Wesley Chapel area due to stream flooding as well as poor drainage. Several vehicles were stalled in flood water. Three people had to be rescued when water from a flooding stream surrounded their homes along Goldmine Rd in Wesley Chapel.
MINERAL SPG	8/8/2024	Media reported isolated flash flooding developed in parts of Union County after 4.5 to 5.5 inches of rain fell in association with the remnants of Tropical Storm Debby. Bates Branch overflowed its banks west of Monroe and inundated Pleasant Grove Rd. Additionally, a stream gauge on Bearskin Creek in Monroe briefly exceeded flood stage, indicating inundation of a portion of Stafford St. Parks and Greenways along the stream were also inundated.
INDIAN TRAIL ARPT	9/27/2024	Stream gauges indicated flash flooding developed along Goose Creek and Bearskin Creek in Union County after 3 to 5 inches of rain fell across the northern part of the county over a couple of days, with 1 to 2 inches of that falling in less than three hours on the morning of the 27th. Stevens Mill Rd was flooded by Goose Creek. Bearskin Creek inundated Stafford St and flooded lower portions of Dickerson Park.

TABLE H.5: HAIL EVENTS (1959-2024)

Location	Date	Size (in)	Description
		Cabarrus County	
Cabarrus County	4/28/1959	1.25”	
Cabarrus County	4/13/1970	1.75	
Cabarrus County	6/21/1970	2	
Cabarrus County	5/16/1982	1	
Cabarrus County	3/8/1983	1.25	
Cabarrus County	4/14/1984	1.75	
Cabarrus County	6/4/1985	1.75	
Cabarrus County	6/5/1985	4.5	
Cabarrus County	6/5/1985	1	
Cabarrus County	6/5/1985	0.75	
Cabarrus County	6/5/1985	1	
Cabarrus County	4/24/1987	1	
Cabarrus County	8/29/1987	0.75	
Cabarrus County	7/8/1990	1	
Cabarrus County	8/7/1991	0.88	
Cabarrus County	4/30/1992	1.75	
Concord	5/19/1993	0.75	
Mt Pleasant	5/1/1995	0.88	
NE Concord	7/6/1995	1	Several reports of trees down.
CONCORD	8/28/1997	1	Severe thunderstorms caused wind damage and hail in the southern Piedmont. Trees were blown down in scattered locations from Kings Mountain across Gaston county, to the Charlotte-Douglas International Airport area. A more powerful downburst apparently occurred around Mineral Springs where 20 to 25 trees were downed, homes suffered damage, and a business was partly unroofed.
HARRISBURG	3/20/1998	1	Deep low pressure moved through the Tennessee and Ohio River Valleys on the 20th, pushing a strong cold front east across western North Carolina. Severe thunderstorms developed in a very unstable airmass during the morning in the mountains and the piedmont during the mid-afternoon. Straight-line wind damage resulted in several downed trees. A weak, short-lived tornado was observed by a woman in Mint Hill to briefly touchdown in front of her stopped car. Tornado damage was confined to trees and power lines. Hail up to 2 inches in diameter did quite a bit of damage - especially in the Mint Hill area where dollar

Location	Date	Size (in)	Description
			amounts were unknown, but considered very high. Hail piled up to a depth of 2 feet in Pineville and twin rope funnel clouds were observed as well. A couple of roads were washed out in western Caldwell county as excessive rain fell on the higher elevations of the county.
MIDLAND	4/3/1998	1.75	A strong spring storm system moved northeast through the Tennessee Valley on the 3rd. A couple thunderstorms along the occluded front that passed across the mountains became severe and produced hail up to quarter size. Other severe thunderstorms developed along a thermal-moisture boundary in the piedmont and produced hail up to 2 inches in diameter.
KANNAPOLIS, CONCORD	5/7/1998	2.75	Supercell thunderstorms developed in a highly sheared atmosphere in eastern Tennessee then moved east across the mountains, foothills and western piedmont of North Carolina. These long-lived, cyclic supercells produced a considerable amount of large hail and some damaging winds in the mountains.
KANNAPOLIS	5/8/1998	0.75	An isolated severe thunderstorm downed three large trees and produced grape size hail.
CONCORD	5/27/1998	0.75	A frontal boundary in the area again provided the focus for thunderstorm development during the afternoon of the 27th. Many storms became severe across western North Carolina and produced hail ranging in size between dimes and quarters. Severe straight-line winds downed numerous trees and power lines, some on houses, in Sylva and Brevard. A few cars were damaged as well. Several trees and power lines were downed in Cornelius later in the afternoon. Lightning struck an apartment in Hickory and caused an attic fire.
KANNAPOLIS	5/2/2000	0.75	A cluster of strong to severe thunderstorms tracked east across the western piedmont during the early evening. The storms produced dime to golf ball size hail and some wind damage. The most severe storm occurred in Lincoln county where golf ball size hail fell for 10 minutes and piled high enough to survive the night and still be on the ground the next morning. Icy roads and dense fog developed along NC Hwy 27 East out of Lincolnton as a result of the hail's longevity. Scattered trees and limbs were also blown down around Lincolnton and south of Denver.
CONCORD	5/13/2000	1	Thunderstorms developed in the mountains in the early afternoon with several becoming severe a few hours later. Other severe thunderstorms moved into or developed in the foothills and piedmont during the early evening. Hail up to the size of walnuts and some wind damage occurred in the mountains and foothills. Several trees were blown down near Fairview. In Cleveland county, 1.5-foot diameter trees were blown down in Belwood, and a number of structures were damaged in Polkville. Just west of Lincolnton several trees and power lines were downed, some on mobile homes. Lightning from the storm in Lincolnton knocked out power to the 911 center. Numerous trees and power lines were downed and a couple of storage buildings were blown over northeast of Gastonia. In Dallas, a trailer park sustained damage to a storage building, 3 young Bradford pear trees, underpinning, a power meter, and heavy doghouse. Mecklenburg county police reported 7 to 10 trees downed north of Charlotte. Considerable damage occurred in Cabarrus county with numerous trees blown down through the northern and central parts of Concord. Winds were estimated as high as 70 mph in western Cabarrus county due to a significant number of downed trees, with many on houses and some blocking roads. Crews had to work most of the night to clear trees and restore power. A deputy said he observed a tornado touch down, lift, and touch down again before ending as a waterspout over Coddle Creek Reservoir. However, there was not enough evidence to confirm the event as a tornado.

Location	Date	Size (in)	Description
CONCORD	4/1/2001	0.75	
HARRISBURG	7/5/2001	1.25	Half-dollar-sized hail reported at Lowes Motor Speedway.
HARRISBURG	7/3/2002	1	
HARRISBURG	7/4/2002	0.88	Reported on Highway 49.
CONCORD	7/22/2002	0.75	
CONCORD	5/3/2003	1	
MT PLEASANT	5/3/2003	0.88	
HARRISBURG	5/3/2003	0.75	
KANNAPOLIS	6/7/2005	1	
MT PLEASANT	4/22/2006	0.75	Penny size hail and large tree limbs down on Lentz Harness Shop Rd.
KANNAPOLIS	5/14/2006	1.75	
CONCORD	5/14/2006	1.75	Golf ball hail reported at exit 60 on Interstate 85.
CONCORD	5/14/2006	1.75	Golf ball hail reported at exit 60 on Interstate 85.
CONCORD	5/18/2006	1	
CONCORD	5/18/2006	0.75	
KANNAPOLIS	5/18/2006	1	
CONCORD	6/10/2006	1.75	
HARRISBURG	6/10/2006	1	Quarter size hail near the intersection of Rocky River Rd and Hickory Ridge Rd.
CONCORD	6/12/2006	0.75	
MT PLEASANT	8/7/2006	0.75	Reported at the intersection of Mount Pleasant Rd and highway 49.
CONCORD	4/15/2007	1	Severe thunderstorms developed during the early afternoon hours over the foothills and western Piedmont of North Carolina.
KANNAPOLIS	5/12/2007	0.75	Severe storms produced large hail over the North Carolina Foothills and Piedmont during the afternoon hours.
CABARRUS	6/24/2007	0.75	Reported on highway 601 south of Concord.
KANNAPOLIS	6/25/2007	0.88	Scattered severe storms developed over western North Carolina during the afternoon and evening hours.
CONCORD	6/26/2007	0.75	Scattered severe storms developed over western North Carolina. Most of the storms occurred during the late afternoon and evening hours.
MT PLEASANT	4/20/2008	0.75	Reported on Pickens Rd.
ROBERTA MILLS	4/26/2008	0.75	Reported at Poplar Tent Rd and I-85.
CONCORD	4/26/2008	0.88	Scattered severe storms affected western North Carolina during the afternoon and evening hours.
CONCORD	5/9/2008	1	Severe storms developed over western North Carolina during the evening hours and produced large hail.
GLASS	5/11/2008	1	Reported at the intersection of highway 73 and Odell School Rd.
CONCORD	5/11/2008	2.75	An isolated supercell thunderstorm developed over the South Mountains in the North Carolina Piedmont. The storm then tracked east, producing large to very large hail and brief tornadoes during its 3-hour lifetime. There was quite a bit of hail damage, particularly in the city of Concord in Cabarrus County, though no damage estimates were available.
NORTH CONCORD	5/11/2008	1.75	Reported on Kidd Ct.
CABARRUS	5/11/2008	0.88	Reported at Branch View Rd and South Union Rd.
JACKSON PARK	5/11/2008	1	Reported at highway 601 and highway 29.
CONCORD	5/11/2008	1	An isolated supercell thunderstorm developed over the South Mountains in the North Carolina Piedmont. The storm then tracked east, producing large to very large hail and brief tornadoes during it's 3 hour lifetime. There was quite a bit of

Location	Date	Size (in)	Description
			hail damage, particularly in the city of Concord in Cabarrus County, though no damage estimates were available.
MT PLEASANT	5/11/2008	1.75	Hail covered the ground.
GLASS	5/20/2008	0.88	Reported on Golden Desert Ct.
CONCORD	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
CONCORD	5/20/2008	1	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
CONCORD	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
CONCORD	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
CONCORD	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
MIDLAND	6/11/2008	0.88	Scattered severe storms affected western North Carolina during the evening hours.
CONCORD	6/22/2008	1	Hail lasted for several minutes.
ROBERTA MILLS	6/22/2008	1	Severe storms developed over the North Carolina mountains during the early afternoon hours. The storms progressed eastward during the afternoon and evening affecting much of western North Carolina.
WEST CONCORD	6/22/2008	0.88	Severe storms developed over the North Carolina mountains during the early afternoon hours. The storms progressed eastward during the afternoon and evening affecting much of western North Carolina.
WATTS XRDS	4/10/2009	1	Elevated thunderstorms produced large hail over the Piedmont and foothills of western North Carolina.
ROBERTA MILLS	4/10/2009	1.25	Numerous hail reports were received in this area. Reports included penny size hail near the Lowes Motor Speedway, several quarter size hail reports in the Concord area and half dollar sie hail in Mount Pleasant.
NORTH CONCORD	7/22/2009	0.75	Hail was reported near I-85 on the north side of town.
CABARRUS	7/23/2009	0.75	Scattered thunderstorms developed over the North Carolina Foothills. A few of the storms produced large hail and wind damage.
JACKSON PARK	3/28/2010	1	Hail, up to the size of quarters, was reported to be covering the ground.
MT PLEASANT ARPT	6/29/2010	1.25	Scattered thunderstorms developed over western North Carolina during the afternoon hours. With moderate wind shear over the region, a couple multicell severe storms developed.
WATTS XRDS	7/20/2010	0.88	Scattered thunderstorms developed in a moist airmass over western North Carolina during the afternoon hours. A few of the thunderstorms produced small areas of wind damage and a little small hail.
JACKSON PARK	5/27/2011	1.75	Golf ball size hail fell from International Dr near I-85 into Kannapolis.
JACKSON PARK	6/11/2011	1	Quarter size hail near the intersection of Poplar Tent Rd and George Liles Parkway.
MT GILEAD	6/11/2011	0.75	Dime size hail fell at the intersection of Centergrove Rd and Camp Julia Rd.
ROBERTA MILLS	6/11/2011	0.75	Dime size hail was reported on Bruton Smith Bvd.
KANNAPOLIS	6/28/2011	1.5	Larger than half dollar size hail on highway 127 in the Viewmont community.
JACKSON PARK	9/2/2011	0.88	While the wind shear was fairly weak over western North Carolina, a very unstable atmosphere and hot temperatures resulted in scattered thunderstorm activity over the region. A few of the storms produced areas of damaging straight-line winds and even some large hail as they drifted slowly to the south.

Location	Date	Size (in)	Description
CONCORD	9/27/2011	0.75	Scattered showers and thunderstorms developed late in the day along a strong cold front. A few of the storms produced wind damage and small hail.
MIDLAND	3/24/2012	0.88	Multiple reports of up to nickel size hail were received along highway 601 north of Midland.
HARRISBURG	5/21/2013	1	Scattered, disorganized thunderstorms developed over the North Carolina Piedmont, and eventually the mountains, during the afternoon hours. A few of the storms became severe, producing large hail and wind damage.
CONCORD	6/13/2013	1.5	Large hail was reported near Concord.
BARRIERS MILL	6/28/2013	1	Quarter size hail was reported a few miles south of Mount Pleasant.
CONCORD	5/10/2014	1	Two public reports of quarter size hail were received from the Concord area.
MT PLEASANT	6/10/2014	1	EM reported quarter size hail near Mount Pleasant. Public reported nickel to quarter size hail off North Dr (1 NNE).
MT PLEASANT	6/10/2014	0.88	FD and county comms reported nickel size hail in the Mount Pleasant area.
CONCORD	6/11/2014	0.75	HAM radio operator reported 3/4 inch hail on Firelight Ct at Highway 601.
WATTS XRDS	9/2/2014	0.75	Public reported 3/4 inch hail on Rock Olive Dr.
GLASS	4/20/2015	1	Multiple spotters and public reports of dime to quarter size hail were received between Kannapolis and Concord. Public reported quarter size hail 8 6 NNW Mount Pleasant.
HARRISBURG	4/20/2015	1	Spotter and the public reported quarter size hail near Harrisburg.
FLOWS STORE	4/20/2015	0.88	FD reported nickel size hail.
CONCORD	6/22/2015	0.75	Public reported 3/4 inch hail near downtown Concord.
WEST CONCORD	5/2/2016	1	Public reported quarter size hail at the intersection of Highways 49 and 601.
CONCORD	5/2/2016	0.75	Public reported 3/4 inch hail in downtown Concord.
CABARRUS	7/19/2016	0.75	Public reported 3/4 inch hail near Midland.
GLASS	3/1/2017	1	Public reported quarter size hail near Bethpage Rd and South Main St. At least one other report of nickel to quarter size hail was received in the Kannapolis area.
KANNAPOLIS	3/1/2017	1	HAM radio operator reported quarter size hail on south Main Street.
HARRISBURG	3/21/2017	2.5	Public reported golf ball to tennis ball size hail near Harrisburg.
ROCKY RIVER	3/21/2017	2.75	Public reported ping pong ball to baseball size hail covering the ground on Moss Creek Drive.
CONCORD	7/23/2017	0.88	Spotter reported nickel size hail near Concord.
KANNAPOLIS	5/4/2019	1.5	Public reported quarter size hail in the Kannapolis area. Emergency manager reported ping pong ball size hail on Pless St in Concord.
ROBERTA MILLS	5/4/2019	1	Public reported quarter size hail.
FLOWS STORE	5/11/2019	0.88	Spotter reported nickel size hail near Geneva Road and Lower Rocky River Road.
ROBERTA MILLS	3/27/2021	1.75	Multiple public reports of quarter to golf ball size hail along Highway 73 in western Cabarrus County from near Coddle Creek reservoir to the west side of Concord.
MT PLEASANT	3/27/2021	1	Public reported quarter size hail near Mount Pleasant.
ROCKY RIVER	5/21/2022	0.88	Public reported nickel size hail.
GLASS	6/14/2022	1	Public reported quarter sized hail on Odell School Rd.
JACKSON PARK	6/14/2022	1	Public reported dime to nickel sized hail in the Poplar Tent community.
GLASS	6/16/2022	1	Public reported quarter size hail.
ROBERTA MILLS	4/22/2023	0.75	Public reported 3/4 inch hail via mping project.
ROBERTA MILLS	6/26/2023	1.5	Public reported (via Social Media) ping pong ball size hail along Pitts School Rd north of the Speedway and quarter size hail closer to Harrisburg.

Location	Date	Size (in)	Description
KANNAPOLIS	6/26/2023	1	Public reported quarter size hail in the Kannapolis area.
MT PLEASANT	6/4/2024	1	Public reported up to quarter size hail in Mount Pleasant.
RIMER	7/16/2024	1	Public reported marble to quarter size hail.
Stanly County			
Stanly County	6/26/1961	2”	
Stanly County	5/20/1967	1.75	
Stanly County	6/22/1978	1.75	
Stanly County	7/16/1981	2	
Stanly County	3/8/1983	1	
Stanly County	3/8/1983	1.75	
Stanly County	6/6/1985	1.25	
Stanly County	8/29/1987	1.75	
Stanly County	8/29/1987	2.75	
Stanly County	8/29/1987	2.75	
Stanly County	8/29/1987	2.75	
Stanly County	5/16/1988	1.75	
Stanly County	9/10/1990	0.75	
Stanly County	10/25/1990	0.88	
Stanly County	4/24/1992	0.75	
Albemarle	3/24/1993	1.75	
Oakboro	5/19/1993	0.75	
Locust	9/25/1994	1	
Near Albemarle	4/30/1995	1.75	Sheriff's Department reported golf ball-size hail in the north-eastern part of the county.
ALBEMARLE	5/24/1996	1.5	
BADIN	6/13/1997	0.75	DIME SIZE HAIL FELL IN BADIN AND ALBEMARLE.
NORWOOD	4/3/1998	1	
STANFIELD	4/3/1998	0.75	
MILLINGPORT	5/27/1998	0.75	
OAKBORO	6/10/1998	0.88	
OAKBORO	7/22/2000	0.75	Dime size hail reported on NC 138.
OAKBORO	3/31/2002	1.25	
LOCUST	7/1/2002	0.75	
BADIN	5/3/2003	0.88	
AQUADALE	5/3/2003	2.75	
ALBEMARLE	5/3/2003	1.75	
RICHFIELD	4/22/2006	0.75	PENNY SIZE HAIL REPORTED ON ROUTE 49 IN RICHFIELD.
RICHFIELD	5/14/2006	2.5	
NEW LONDON	5/18/2006	0.75	
ALBEMARLE	6/23/2006	0.75	Reported near Lake Tillery.
ALBEMARLE	6/23/2006	0.75	
ALBEMARLE	8/3/2006	0.75	Reported on US HWY 52.
ALBEMARLE	4/15/2007	1	Three rounds of severe weather struck Central North Carolina from the morning hours through the afternoon and into the evening. Widespread reports of damaging winds and large hail occurred with a rapidly intensifying surface low and attendant cold frontal passage. A powerful 70 knot low-level jet also aided in the initial round of severe storms. Thunderstorms re-developed in the late

Location	Date	Size (in)	Description
			afternoon and evening hours as an amplifying upper level shortwave trough rotated across Central North Carolina.
NEW LONDON	5/9/2007	0.75	Reported at New London High School on Highway 52.
ALBEMARLE	5/12/2007	0.75	In addition to penny size hail, a 16 to 18 inch diameter tree limb fell onto a house.
ALBEMARLE	6/11/2007	0.75	Upper jet dynamics associated with a 80 to 90 kt jet max combined with surface heating triggered thunderstorms across central and western portions of the piedmont.
ALBEMARLE	6/24/2007	1	Scattered thunderstorms developed in the mountains and foothills during peak diurnal heating and moved east into the western piedmont.
RICHFIELD	3/15/2008	0.75	Penny size hail was reported in Richfield.
NORWOOD	3/15/2008	1	Quarter size hail was reported in Norwood.
LAMBERT	4/20/2008	0.75	Over the course of two day, several shortwave vorticity maxes rotated across the area as a closed upper low spun rotated through the region. Severe thunderstorms developed amidst steepening mid level lapse rates and peak afternoon heating. The severe storms resulted in mainly large hail, ranging from penny to golf ball size hail with an isolated flash flooding.
MILLINGPORT	4/20/2008	1	Quarter size hail was reported near the Lambert community.
NEW LONDON	5/9/2008	0.88	Nickel size hail was reported at 44009 Hearne Road in New London.
MILLINGPORT	5/11/2008	0.75	Penny size hail was reported on Highway 73, two miles west of Plyer.
LOCUST	5/20/2008	1.75	Numerous thunderstorms developed across central North Carolina when a cold front and associated shortwave trough moved through central North Carolina during strong daytime heating. The severe storms produced widespread reports of large hail with only scattered thunderstorm wind damage.
MILLINGPORT	5/20/2008	0.88	Numerous thunderstorms developed across central North Carolina when a cold front and associated shortwave trough moved through central North Carolina during strong daytime heating. The severe storms produced widespread reports of large hail with only scattered thunderstorm wind damage.
ALBEMARLE ARPT	5/20/2008	1.5	Numerous thunderstorms developed across central North Carolina when a cold front and associated shortwave trough moved through central North Carolina during strong daytime heating. The severe storms produced widespread reports of large hail with only scattered thunderstorm wind damage.
NORWOOD	7/8/2008	1	Quarter-size hail was reported along a stretch of Highway 52 from northwest of Norwood to Price Street.
AQUADALE	7/23/2008	0.75	Pre-frontal convection broke out across central North Carolina early in the day, as a weak cold front approached from the west. Another round of storms developed late in the afternoon and evening with the approach of the upper level trough. There were a few reports of penny-size hail and minor thunderstorm wind damage.
HALLS FERRY JCT	4/10/2009	1.75	A swath of hail was reported ranging from quarter to golf ball size hail starting near Rogers Road and ending near NC Highway 740 and US Highway 52 near New London.
ALBEMARLE ARPT	5/5/2009	0.75	Penny sized hail was reported at the intersection of North Carolina Highway 24 and United States Highway 52.
PORTER	5/5/2009	0.88	Penny sized hail was reported along North Carolina Highways 24/27/73, near Tillery Lake.
ST MARTIN	7/20/2009	1	A cluster of convection developed across central North Carolina as a large upper trough and upper jet translated east across the area. Large severe hail up to the size of golf ball was reported with thunderstorm wind damage responsible for structural damage to area homes in Moore County.
LOCUST	6/15/2010	0.75	Locust Fire Department reported a period of hail up to penny size.

Location	Date	Size (in)	Description
LOCUST	6/15/2010	0.88	Nickel size hail was reported near Locust Elementary School.
ALBEMARLE ARPT	5/11/2015	1	Quarter size hail was reported southwest of Albemarle.
LAMBERT	7/23/2015	1	An area of low pressure tracked along a stalled weak frontal boundary across southern portions of central North Carolina and produced scattered showers and storms. a few of the storms became severe and produced damaging winds and quarter size hail.
COTTONVILLE	5/11/2019	1	A line of showers and thunderstorms developed ahead of a mid level disturbance and associated cold front during the afternoon. A portion of the line across the southwest Piedmont of central North Carolina tracked along a outflow boundary, which helped intensify the line and produce large hail and a tornado in Stanly County.
MILLINGPORT	3/27/2021	0.75	Thunderstorms initially over middle and eastern Tennessee during the morning moved to the east of the Appalachians during the the afternoon, where they intercepted an east/west-oriented quasi-stationary front over central and eastern North Carolina. The storms intensified, while scattered supercells developed immediately preceding them, and tracked all generally eastward along and in the vicinity of the front. Some of the storms become strong to severe and produced large hail up to the size of a golf ball and damaging wind.
Union County			
Union County	6/3/1982	1.75”	
Union County	3/8/1983	1.75	
Union County	6/7/1985	1	
Union County	6/7/1985	1	
Union County	5/25/1986	0.75	
Union County	8/3/1986	0.75	
Union County	4/15/1987	0.88	
Union County	4/16/1987	1.75	
Union County	5/1/1987	1.75	
Union County	6/18/1987	0.75	
Union County	8/29/1987	1.75	
Union County	8/29/1987	1.75	
Union County	5/17/1988	0.75	
Union County	5/17/1988	0.75	
Union County	4/29/1989	1.5	
Union County	4/30/1989	0.75	
Union County	4/30/1989	1.75	
Union County	5/5/1989	2	
Union County	6/5/1989	0.75	
Union County	4/1/1990	1	
Union County	4/1/1990	1	
Union County	5/2/1990	1.25	
Union County	5/21/1990	0.75	
Union County	3/13/1991	0.75	
Union County	7/3/1992	0.75	
Waxhaw	3/24/1993	1	
Houston	4/16/1993	1	
Stallings	8/27/1994	1.75	Golfball sized hail fell in the town of Stallings.

Location	Date	Size (in)	Description
Waxhaw	9/1/1994	1.75	Golfball-size hail reported near Waxhaw in western Union County.
New Salem, Indian Trail	5/1/1995	1.75	Golf ball-size hail at Highway 218 and 205.
Waxhaw	5/19/1995	0.75	
Indian Trail	6/12/1995	1.5	
MINERAL SPG	3/15/1996	0.75	A developing squall line caused large hail in the mountains before moving into South Carolina. As the storm system moved rapidly east it again caused damage in North Carolina - this time in the piedmont around Gastonia. A 30 foot section of the roof was blown off the loading dock at Eastridge Mall. Wind damage was also reported in Bessemer City and large hail fell in Union county.
WAXHAW	3/16/1996	0.75	Large hail fell in a number of locations. From Cleveland county into Lincoln county hail accumulated to a couple of inches in a few places. The hail was smaller around Gaston and Union counties.
WAXHAW	3/29/1997	1.25	Severe thunderstorms caused large hail.
MINERAL SPG, MONROE	7/5/1997	1.75	A cluster of severe thunderstorms developed in the evening southeast of Charlotte. Large hail caused extensive damage to cars in Monroe.
INDIAN TRAIL	7/16/1997	0.75	Severe thunderstorms developed mainly in the foothills of North Carolina during the afternoon. Damaging winds up to 75 mph downed trees and power lines. U.S. Highway 74 in Henderson county was blocked for 2 hours due to a large oak tree that fell across the road. Another large tree in Cleveland county fell onto 2 pickup trucks, totalling them. Three houses were damaged by fallen trees, a car was damaged by a collapsed convenience store canopy and trees blocked roads near Indian Trail. Power outages were scattered across the region, some due to lightning. Up to 4300 people were without power in Union county.
STURDIVANTS	9/10/1997	0.75	A severe thunderstorm blew down power lines and caused large hail.
WEDDINGTON, MONROE	6/10/1998	0.75	A warm front pushing north through western North Carolina helped initiate heavy rain and severe thunderstorms during the morning of the 10th. Many reports of trees down and large hail were received from the western piedmont. A car was blown off the road near Kings Creek. Chicken houses were damaged near Taylorsville allowing ten thousand chickens to run free. Numerous trees were uprooted in Monroe and wind-blown golf ball size hail broke windows and damaged cars. Heavy rain in a short period of time resulted in some urban flooding from the Belmont and Mount Holly areas, to the south side of Charlotte. Numerous roads were flooded and several motorists required rescue in different parts of the city. Lightning severely damaged a church in Millersville, but no damage estimate was available. Several homes were struck by lightning in the Charlotte area, causing extensive damage. In Wingate, one house was severely damaged and two others minorly damaged by lightning. Lastly, a lightning strike in Highlands ignited a fire that burned a large house and its contents, including a Corvette. No damage estimates were given.
WEDDINGTON, MINERAL SPRING	6/24/1998	0.88	Multi-cell thunderstorms again developed in the early evening and moved south across the southern mountains and piedmont. A few became severe and produced large hail up to golf ball size, as well as damaging winds. Wind damage was confined to downed trees and power lines. The hardest hit area was northeast of Brevard where roads were blocked.
MONROE	7/20/1998	0.75	A cluster of severe thunderstorms developed west into Cabarrus county, producing numerous microbursts that downed trees and power lines as they moved slowly south over the course of an hour and fifteen minutes. Especially hard hit was the area from Concord into the southern and eastern portions of the county. The storms eventually moved into Union county and produced dime size hail west of Monroe. Lightning strikes also caused several house fires in Iredell,

Location	Date	Size (in)	Description
			Cabarrus and Union counties until late in the evening. One house in Union county was a total loss.
WINGATE, WAXHAW	5/13/1999	1.75	Scattered thunderstorms developed during the afternoon and evening of the 13th and a few pulsed to severe levels. In Henderson county, golf ball size hail covered Highway 280 and a large tree fell onto a house in Hendersonville, causing significant damage to the house and outdoor furniture. Dime to golf ball size hail was reported in Union county along with a measured wind gust to 85 mph. Quarter size hail was reported late in the evening in Avery county. There was a public report of a sighting of a very weak tornado that appeared to make a brief touchdown, but caused no damage, north of Marion. Due to insufficient data in support of this report, an official tornado event will not be entered.
MARSHVILLE	8/1/1999	1	Clusters of severe thunderstorms rumbled through the southern piedmont of North Carolina during the late afternoon and evening hours. Straight-line winds produced by these storms downed many trees and some power lines. One house in Mt. Ulla was damaged by a downed tree. A citizen near Pineville reported twin gustnadoes separated by 30 seconds, which spun up along the gust front of one of the severe thunderstorms. The wind from the gustnadoes pinned the man against the outside wall of his home, chewed up tree limbs and downed a few trees, and threw a 40-foot section of a tree over his house. A neighbor measured the wind associated with the first gustnado at 70 mph with a hand held anemometer. Large hail and straight-line winds broke windows in Marshville.
MINERAL SPG, MONROE, WAXHAW	4/17/2000	0.75	Thunderstorms erupted in the afternoon and evening across western North Carolina. Several clusters of storms became severe and produced hail ranging in size from dimes to golf balls. The general public in Linville was quoted as saying the hailstorm was the worst ever seen due to the amount that covered the ground. Golf ball size hail dimpled cars in Waxhaw. Some damaging straight-line winds occurred as well with one tree falling on a car in Mecklenburg county and several trees downed in Waxhaw.
WAXHAW, MONROE	5/25/2000	1.25	Two severe thunderstorms affected Union county late in the afternoon and then later on in the evening. Large hail fell in and south of Waxhaw in the afternoon. Quarter size hail was reported west of Monroe and straight-line winds blew down trees and power lines in Waxhaw later in the evening.
INDIAN TRAIL	6/4/2000	1	Quarter size hail fell from a lone severe thunderstorm shortly after midnight.
MONROE	4/1/2001	1.75	
WAXHAW	5/19/2001	0.75	
WEDDINGTON	5/25/2001	0.75	A strong cold front dropped into the region on the 25th, resulting in numerous severe weather reports.
MONROE, INDIAN TRAIL, FAIRVIEW	3/31/2002	0.88	
WEDDINGTON	7/4/2002	0.88	
UNIONVILLE	4/10/2003	0.88	
MONROE	5/15/2003	1	Hail fell near highway 74.
UNIONVILLE	5/25/2003	0.75	
NEW SALEM	5/31/2003	1.75	
STALLINGS	7/13/2003	0.75	
MARSHVILLE	8/5/2004	0.88	
MONROE	4/3/2006	0.75	
STALLINGS	7/2/2006	1.5	
STALLINGS	4/12/2007	1.25	Large hail reported on Stallings Rd and Aurora Bvd in the Stallings area.

Location	Date	Size (in)	Description
WAXHAW	6/12/2007	0.88	Scattered severe storms developed over western North Carolina for a second day in a row. The storms mainly produced large hail.
MINERAL SPG	8/22/2007	1.75	A few severe storms affected the western Piedmont of North Carolina during the afternoon hours.
NEW SALEM	3/15/2008	0.88	Severe storms affected the far southern Piedmont of North Carolina during the late afternoon hours.
WAXHAW	6/1/2008	0.75	Large hail affected the western Piedmont of North Carolina with an isolated severe thunderstorm.
MONROE	6/10/2008	0.75	Reported on highway 200.
WAXHAW	6/11/2008	0.88	Hail reported near the intersection of Nesbit Rd and highway 200.
UNIONVILLE, WAXHAW, FAIRVIEW	6/11/2008	1	Scattered severe storms affected western North Carolina during the evening hours.
WAXHAW, MONROE	7/8/2008	0.88	Several severe storms affected western North Carolina during the afternoon and evening hours.
MARVIN	7/23/2008	0.88	Scattered severe storms developed during the evening hours over western North Carolina.
MONROE	8/2/2008	1.75	A cold front triggered several severe storms over western North Carolina during the afternoon and evening hours.
MINERAL SPRING	2/18/2009	0.75	A small cluster of thunderstorms produced isolated large hail over the western North Carolina Piedmont.
WINGATE	6/10/2009	0.88	Several clusters of thunderstorms produced areas of severe weather over parts of western North Carolina during the afternoon and evening hours. Some flash flooding was also observed over the region.
WAXHAW	4/27/2010	0.75	Dime size hail was reported along Maggie Robinson Rd.
MONROE	6/15/2010	1	Thunderstorms erupted in the lee trough over the North Carolina foothills during the early afternoon hours. The storms produced areas of damaging straight-line winds and large hail over much of the foothills and western piedmont.
INDIAN TRAIL, MARSHVILLE	7/13/2010	0.88	A couple thunderstorms developed a little ahead of a cold front over western North Carolina during the afternoon hours. A long lived multicell severe storm produced most of the severe weather. The storm exhibited supercell characteristics for short periods of time, during which it produced two brief tornadoes.
WAXHAW, ALTON, INDIAN TRAIL, WESLEY CHAPEL, MINERAL SPRING	4/9/2011	1.75	Thunderstorms initiated over the mountains of North Carolina during the afternoon hours. As the afternoon progressed, several supercell thunderstorms developed which tracked southeast across the foothills and piedmont along a slow-moving surface cold front. With unusually steep lapse rates over the region, several of the storms produced large hail. Fortunately, the supercells were a little elevated in nature, and only one, brief, weak tornado developed. Still, hail ranging up to the size of a softballs did quite a bit of damage over the region.
WINGATE	5/13/2011	1	Penny to quarter size hail was reported at Wingate University.
SHALETON	9/5/2011	1	Quarter size hail fell at Sardis Church Rd and Unionville-Indian Trail Rd.
WAXHAW	4/26/2012	1	Thunderstorms developed during the afternoon along an outflow boundary from an MCS that crossed the region earlier in the day. The afternoon and evening storms produced large hail and some straight-line wind damage.
MINERAL SPRING	5/14/2012	1.75	Numerous reports of quarter to golf ball size hail were received from near Mineral Springs to the northwest side of Monroe. The largest hail reported fell near Mineral Springs.
WAXHAW ARPT	7/1/2012	1.75	Golf ball size hail was reported near the intersection of Nesbit Rd and Potter Rd S.

Location	Date	Size (in)	Description
ALTON	7/5/2012	1	Quarter size hail fell on Bruce Thomas Rd near Stack Rd.
UNIONVILLE	7/9/2012	0.88	Scattered thunderstorms developed along a southward moving cold front during the afternoon hours. A few of the thunderstorms caused wind damage and dropped large hail.
FAIRFIELD	8/2/2012	1.75	Half dollar to golf ball size hail fell over northeast Union County.
FAIRVIEW, STALLINGS	6/13/2013	1	A line of thunderstorms developed over eastern Tennessee ahead of a cold front. The line pushed east across the mountains and then across the foothills and piedmont during the afternoon and early evening hours. The line formed in an airmass characterized by high instability and moderate wind shear, and several of the storms produced areas of straight-line wind damage and one rare tornado in the North Carolina Mountains. The storms also produced large hail over the foothills and piedmont.
UNIONVILLE	6/13/2013	1.75	Golf ball size hail was reported near Unionville.
WAXHAW	5/23/2014	1.75	Public reported golf ball size hail near Waxhaw.
STALLINGS	5/29/2014	1	Public reported quarter size hail.
ALTON	6/21/2014	1	Spotter reported quarter size hail.
WINGATE	5/2/2016	1	Public reported quarter size hail via Social Media.
INDIAN TRAIL	5/3/2016	1	Public reported quarter size hail at Porter Ridge Middle School.
MONROE	7/23/2017	1	Spotter reported quarter size hail south of Monroe.
INDIAN TRAIL	9/13/2019	1	Public reported brief quarter sized hail.
WAXHAW ARPT	6/28/2020	0.75	Public reported penny size hail.
WAXHAW ARPT	6/3/2022	0.75	Public reported 3/4 inch hail on Dapple Ridge Rd.
WAXHAW ARPT	6/17/2022	1.25	Public reported half dollar size hail on Brady Rd.
WESLEY CHAPEL	9/7/2023	1	Public reported quarter size hail in the Weddington area.
WESLEY CHAPEL	9/7/2023	0.88	Public reported nickel size hail.
ALLEN XRDS	5/10/2024	0.75	Spotter reported 3/4 inch hail.
INDIAN TRAIL	5/15/2024	0.75	Public reported 3/4 inch hail.
HOUSTON	5/15/2024	1	Public reported quarter size hail in the Mineral Springs area.

TABLE H.6: HEAVY RAIN EVENTS (1996-2024)

Location	Date	Description
Cabarrus County		
CONCORD	7/18/2003	Minor flooding of urban areas and some roads developed.
HARRISBURG	8/5/2006	Heavy rain from thunderstorms caused flooding due to poor drainage at the intersection of Hudspeth and Morehead Roads, prompting brief closure of the intersection. Also, the Rocky River briefly flooded a low spot on Pharr Mill Rd. Standing water was reported on numerous roads in the city.
CABARRUS	1/6/2009	Water from Clarke Creek briefly overflowed a bridge on Cox Mill Rd.
WEST CONCORD	8/19/2015	FD reported water flooded the basement of a home on Saddlewood Circle after about 2 inches of rain fell in a short period of time. The flooding was described as being the result of poor drainage.
Stanly County		
ALBEMARLE	2/3/1998	Heavy rain spread across central North Carolina during the evening of February 3rd and it continued until the afternoon of the 4th. Storm total rainfall amounts of 2 to 3 inches were common. Raleigh/Durham recorded 2.5 inches, Goldsboro recorded 2.25 inches, Fayetteville received 2.7 inches, and Rocky Mount had nearly 3.0 inches. There were widespread reports of flooding in low-lying, urban, and normally problematic areas. Several roads had to be closed for brief periods of time with the most numerous road closures in Sampson, Warren, Vance, Granville, Halifax, Scotland, Lee and Durham counties. No one was injured during this event.
ALBEMARLE	11/22/2006	Numerous secondary road closures and HWY 52N barricaded due to flood waters.
OAKBORO	11/22/2006	Water rescue on Hartswell Road. Driver in vehicle clung to tree for 50 minutes before rescue. Left vehicle before it was swept away.
Union County		
	4/30/1996	Thunderstorms produced heavy rain which caused some local flooding in and around Charlotte.
	4/30/1996	Thunderstroms produced heavy rain which caused some local flooding in and around charlotte.
NEAR CHARLOTTE	4/30/1996	Thunderstorms produced heavy rain which caused some local flooding in and around Charlotte.
INDIAN TRAIL	6/16/2001	Heavy rainfall, up to 2.1 inches, in a short time caused a sewer system to overflow into the South Fork Crooked Creek. About 3600 gallons of raw sewage were spilled.
FAIRVIEW	8/16/2003	Several trees were uprooted and a well house was damaged in Fairview. Minor flooding occurred on a few roads in urban portions of Fairview and New Salem.
MONROE	6/23/2004	Heavy rain caused a couple of roads to flood due to poor drainage.
MONROE	11/21/2006	Water was reported over roads in flood-prone and low lying areas during the evening. Affected roads included Secrest, Hopewell Church, and Lawyers Rd.
MINERAL SPG	9/13/2014	County comms reported up to two feet of water standing on the road near the intersection of McWhorter Rd and Potter Rd S due to poor drainage after a couple of inches of rain fell in a short period of time.

TABLE H.7: HEAVY SNOW EVENTS (1998-2024)

Date	Location
	Cabarrus County
1/18/2000	Low pressure moved east across Tennessee and weakened as it ran into a surface high pressure ridge along the East Coast. Nevertheless, enough moisture was available to cause heavy snow to fall from Avery county, east across the northern foothills and northwest piedmont. Precipitation began as light rain in the mid-evening hours on the 17th, but quickly turned to snow as the atmosphere cooled to below freezing. Snowfall ranged between 3 and 6 inches across the area by noon on the 18th, with a narrow band of 1 to 3-inch accumulation of snow and sleet to the immediate south.
1/22/2000	A cold dome of arctic high pressure centered over the Mid-Atlantic States provided very cold and dry air to western North Carolina. Meanwhile, weak low pressure moved east along a frontal boundary stalled across the Gulf Coast States to the Georgia coast. Abundant moisture flowed north into the sub-freezing air over western North Carolina, resulting in light snow as early as the afternoon on the 22nd. Snow became heavy by mid-afternoon across the mountains and by evening across the foothills and piedmont. A general 4 to 7-inch snowfall occurred in the mountains with as much as 10 inches reported in Jackson county. Generally, 4 to 6 inches of snow fell across the foothills and piedmont, with a local maximum of 7 inches in western Lincoln county. Rowan county failed to meet heavy snow criteria with accumulations of up to 3 inches. Freezing rain and sleet mixed with the snow for a short time before the precipitation ended, and for the most part, caused little additional problems. The one exception was across southern Union county where freezing rain lasted all night and through much of the morning on the 23rd. Ice accumulations reached damaging levels there around 3 am, causing a large number of trees and power lines to fall throughout the morning. This in turn, resulted in widespread power outages.
1/24/2000	Low pressure rapidly deepened near the Carolina coast, wrapping abundant moisture back across the piedmont of the Carolinas. Snow fell all day and into the night, heavy at times south and east of Interstate 85. By the time snow ended, accumulations ranged from a trace to 4 inches to the immediate north and west of Interstate 85, to 4 to 8 inches from eastern Rowan county to Charlotte and Gastonia, and 10 to 14 inches across southeastern Mecklenburg county and all of Union county. Utility damage in Union county alone was above $4 million, with damage in Monroe at more than $1 million. This storm followed no more than 36 hours after the area received several inches of snow and ice from a previous storm over the weekend.
11/19/2000	Light to moderate snow started in the mountains and spread southeast, lasting through the day. Generally, 1 to 3 inches of snow fell, but some higher elevations of the central and southern mountains reported more than 4 inches.
1/3/2002	Flurries and light snow began in the early evening and became moderate to heavy by late evening on the 2nd. Heavy snowfall accumulations were reached across this portion of the foothills and piedmont overnight on the 3rd, with 4 to 6 inches observed by noon.
1/23/2003	Light snow began around midnight in the southwest piedmont of North Carolina. A burst of heavy snow during the pre-dawn hours resulted in total accumulations of 3 to 8 inches by mid-morning.
2/26/2004	Heavy snow began to fall across the foothills, piedmont, and northern mountains of North Carolina during the late morning. Although snowfall intensity decreased dramatically during the early-to-middle portion of the afternoon, heavy snow redeveloped during the late afternoon, and continued into the evening and overnight hours. Scattered thunderstorms contributed to intense snowfall rates of 2 to 3 inches per hour from time to time, especially in the piedmont, where total snowfall of 12-22 inches occurred. The heaviest amounts occurred in the southwest piedmont, particularly in southern portions of Charlotte metro. Thousands of people were stranded on I-77 during the early afternoon, and some required rescue. The weight of the snowfall caused damage to numerous roofs, while some roofs completely collapsed. Across the foothills and northern mountains, accumulations were considerably lighter, generally in the 4-8-inch range, although amounts of 10-16 inches fell along the Blue Ridge north of I-40.

1/20/2009	Snow developed during the pre-dawn hours across the Piedmont. As snow continued to fall across the Piedmont, heavy snowfall amounts were reached across Cabarrus and Union Counties shortly before the snow completely tapered off. Accumulations ranged from 2-4 inches across the area, although a few higher amounts were reported in eastern portions of these counties.
3/1/2009	Rain changed to snow during the early evening across portions of the foothills and the western Piedmont of North Carolina. Snow became heavy at times throughout the evening, and up to 4 inches had accumulated across the area by 10 pm. Snow, heavy at times and accompanied by occasional lightning, continued into the late evening and early overnight hours. By the time the snow tapered off, accumulations of 3-6 inches were common across the area. However, localized amounts of up to 9 inches were reported, especially along a corridor extending from Shelby to Hickory. The heavy wet snow caused quite a few trees and power lines to fall, resulting in numerous power outages. Some structures received minor to moderate roof damage due to the weight of the snow. Some customers were without power for several days. A tree fell on the library in Belmont, NC, causing damage to the roof. Numerous traffic accidents also occurred.
12/25/2010	A developing coastal storm brought a mix of light rain and snow to portions of the piedmont of western North Carolina during Christmas afternoon. By early evening, precipitation had changed to all snow in most areas northwest of Charlotte, and by late evening, these areas had experienced a rare white Christmas. Shortly after midnight, the precipitation had changed to all snow in the Charlotte metro area. Snow continued to fall steadily overnight, with areas northwest of Charlotte reporting heavy snowfall totals by midnight, with heavy totals not reached until shortly before sunrise along the I-85 corridor. Total accumulations ranged from 2 to 5 inches across the area by the time the snow tapered off to flurries and light snow showers later in the morning.
1/10/2011	Moderate to heavy snow associated with a Gulf Coast storm system spread northward across the foothills and western piedmont of North Carolina during the early morning hours. The heavy snow accumulated quickly, and by sunrise parts of the southwest foothills and piedmont had received 4 inches of snow. The snow was lighter across the northern most foothills and piedmont, where only an inch or two of snow had fallen by mid-morning. The snow became lighter during the day, but continued to accumulate. By early afternoon, snowfall totals ranged from around 7 inches over the southern foothill and southwest piedmont locations, to around 3 inches over the northern most parts of the foothills and piedmont. During the afternoon, precipitation changed to light to moderate freezing rain, which continued into the evening hours. This added as much as a tenth to a quarter inch of ice to the heavy snowfall totals, resulting in sporadic power outages, particularly in the Charlotte metro area. Persistent cold air resulted in only gradual improvement in road conditions, with some businesses and schools remaining closed for several days.
1/17/2018	As a strengthening upper level disturbance and associated cold front approached the region from the Tennessee Valley, light precipitation developed across portions of the Piedmont and foothills of North Carolina during the early morning hours. While the precipitation started as rain or a rain/snow mix in most areas, a transition to snow had occurred in most locations by sunrise. As the snow band moved east throughout the morning, snowfall rates increased, with heavy snowfall accumulations reported by early afternoon. By the time the snow tapered off to flurries, total accumulation ranged from 3 to 6 inches across much of the area.
Stanly County	
1/19/1998	A soaking rain developed across central North Carolina during the overnight hours and gradually changed to snow. Two bands of heavy snow fell. The first band extended from Ansonville of the southern Piedmont northeast through Troy, Southern Pines, Pinehurst, and to Sanford. The second band stretched from Raleigh east through Zebulon, Bailey, Wilson, and Tarboro. Accumulations were in the 2 to 4 inch range with the most accumulations on grassy surfaces and in the trees. Warm ground temperatures, rain soaked ground, and air temperatures in the mid-30s throughout the storm limited snowfall totals significantly.
11/19/2000	An early season snowfall affected portions of central North Carolina on Sunday, November 19. It was the second earliest date that snow has been measured at Raleigh-Durham Airport and at the Piedmont Triad Airport. Rain began to fall in the late morning hours, then changed to a mixture of

	rain, sleet, and snow before ending in the evening. The snowfall was heavy at times in some locations, and up to three inches was recorded. Most locations in central North Carolina received around 2 inches of snow on grassy surfaces. The snow and ice created hazardous driving conditions, leading to numerous accidents.
Union County	
1/18/2000	Low pressure moved east across Tennessee and weakened as it ran into a surface high pressure ridge along the East Coast. Nevertheless, enough moisture was available to cause heavy snow to fall from Avery county, east across the northern foothills and northwest piedmont. Precipitation began as light rain in the mid-evening hours on the 17th, but quickly turned to snow as the atmosphere cooled to below freezing. Snowfall ranged between 3 and 6 inches across the area by noon on the 18th, with a narrow band of 1 to 3-inch accumulation of snow and sleet to the immediate south.
1/22/2000	A cold dome of arctic high pressure centered over the Mid-Atlantic States provided very cold and dry air to western North Carolina. Meanwhile, weak low pressure moved east along a frontal boundary stalled across the Gulf Coast States to the Georgia coast. Abundant moisture flowed north into the sub-freezing air over western North Carolina, resulting in light snow as early as the afternoon on the 22nd. Snow became heavy by mid-afternoon across the mountains and by evening across the foothills and piedmont. A general 4 to 7-inch snowfall occurred in the mountains with as much as 10 inches reported in Jackson county. Generally, 4 to 6 inches of snow fell across the foothills and piedmont, with a local maximum of 7 inches in western Lincoln county. Rowan county failed to meet heavy snow criteria with accumulations of up to 3 inches. Freezing rain and sleet mixed with the snow for a short time before the precipitation ended, and for the most part, caused little additional problems. The one exception was across southern Union county where freezing rain lasted all night and through much of the morning on the 23rd. Ice accumulations reached damaging levels there around 3 am, causing a large number of trees and power lines to fall throughout the morning. This in turn, resulted in widespread power outages.
1/24/2000	Low pressure rapidly deepened near the Carolina coast, wrapping abundant moisture back across the piedmont of the Carolinas. Snow fell all day and into the night, heavy at times south and east of Interstate 85. By the time snow ended, accumulations ranged from a trace to 4 inches to the immediate north and west of Interstate 85, to 4 to 8 inches from eastern Rowan county to Charlotte and Gastonia, and 10 to 14 inches across southeastern Mecklenburg county and all of Union county. Utility damage in Union county alone was above $4 million, with damage in Monroe at more than $1 million. This storm followed no more than 36 hours after the area received several inches of snow and ice from a previous storm over the weekend.
11/19/2000	Light to moderate snow started in the mountains and spread southeast, lasting through the day. Generally, 1 to 3 inches of snow fell, but some higher elevations of the central and southern mountains reported more than 4 inches.
1/2/2002	Heavy snow started falling early in the evening and reached heavy snowfall accumulation status between 8 pm and midnight in this part of the piedmont. Accumulation totals reached 6 to 10 inches between Waxhaw and Monroe.
1/23/2003	Light snow began around midnight in the southwest piedmont of North Carolina. A burst of heavy snow during the pre-dawn hours resulted in total accumulations of 3 to 8 inches by mid-morning.
2/26/2004	Heavy snow began to fall across the foothills, piedmont, and northern mountains of North Carolina during the late morning. Although snowfall intensity decreased dramatically during the early-to-middle portion of the afternoon, heavy snow redeveloped during the late afternoon, and continued into the evening and overnight hours. Scattered thunderstorms contributed to intense snowfall rates of 2 to 3 inches per hour from time to time, especially in the piedmont, where total snowfall of 12-22 inches occurred. The heaviest amounts occurred in the southwest piedmont, particularly in southern portions of Charlotte metro. Thousands of people were stranded on I-77 during the early afternoon, and some required rescue. The weight of the snowfall caused damage to numerous roofs, while some roofs completely collapsed. Across the foothills and northern

	mountains, accumulations were considerably lighter, generally in the 4-8-inch range, although amounts of 10-16 inches fell along the Blue Ridge north of I-40.
1/20/2009	Snow developed during the pre-dawn hours across the Piedmont. As snow continued to fall across the Piedmont, heavy snowfall amounts were reached across Cabarrus and Union Counties shortly before the snow completely tapered off. Accumulations ranged from 2-4 inches across the area, although a few higher amounts were reported in eastern portions of these counties.
3/1/2009	Rain changed to snow during the early evening across portions of the foothills and the western Piedmont of North Carolina. Snow became heavy at times throughout the evening, and up to 4 inches had accumulated across the area by 10 pm. Snow, heavy at times and accompanied by occasional lightning, continued into the late evening and early overnight hours. By the time the snow tapered off, accumulations of 3-6 inches were common across the area. However, localized amounts of up to 9 inches were reported, especially along a corridor extending from Shelby to Hickory. The heavy wet snow caused quite a few trees and power lines to fall, resulting in numerous power outages. Some structures received minor to moderate roof damage due to the weight of the snow. Some customers were without power for several days. A tree fell on the library in Belmont, NC, causing damage to the roof. Numerous traffic accidents also occurred.
12/25/2010	A developing coastal storm brought a mix of light rain and snow to portions of the piedmont of western North Carolina during Christmas afternoon. By early evening, precipitation had changed to all snow in most areas northwest of Charlotte, and by late evening, these areas had experienced a rare white Christmas. Shortly after midnight, the precipitation had changed to all snow in the Charlotte metro area. Snow continued to fall steadily overnight, with areas northwest of Charlotte reporting heavy snowfall totals by midnight, with heavy totals not reached until shortly before sunrise along the I-85 corridor. Total accumulations ranged from 2 to 5 inches across the area by the time the snow tapered off to flurries and light snow showers later in the morning.
1/10/2011	Moderate to heavy snow associated with a Gulf Coast storm system spread northward across the foothills and western piedmont of North Carolina during the early morning hours. The heavy snow accumulated quickly, and by sunrise parts of the southwest foothills and piedmont had received 4 inches of snow. The snow was lighter across the northern most foothills and piedmont, where only an inch or two of snow had fallen by mid-morning. The snow became lighter during the day, but continued to accumulate. By early afternoon, snowfall totals ranged from around 7 inches over the southern foothill and southwest piedmont locations, to around 3 inches over the northern most parts of the foothills and piedmont. During the afternoon, precipitation changed to light to moderate freezing rain, which continued into the evening hours. This added as much as a tenth to a quarter inch of ice to the heavy snowfall totals, resulting in sporadic power outages, particularly in the Charlotte metro area. Persistent cold air resulted in only gradual improvement in road conditions, with some businesses and schools remaining closed for several days.
1/17/2018	As a strengthening upper level disturbance and associated cold front approached the region from the Tennessee Valley, light precipitation developed across portions of the Piedmont and foothills of North Carolina during the early morning hours. While the precipitation started as rain or a rain/snow mix in most areas, a transition to snow had occurred in most locations by sunrise. As the snow band moved east throughout the morning, snowfall rates increased, with heavy snowfall accumulations reported by early afternoon. By the time the snow tapered off to flurries, total accumulation ranged from 3 to 6 inches across much of the area.

TABLE H.8: HIGH WIND EVENTS (1996-2024)

Date	Description
Cabarrus County	
1/19/1996	An extremely strong cold front, preceded by heavy rain all day, moved through the mountains, foothills, and piedmont during the night. High winds affected the mountains first and then the foothills and piedmont as the front swept through. Prefrontal southeast winds were extremely high in the mountains with Flat Top mountain reporting gusts to 72 knots during the early evening. This was the highest wind in 20 years of record. Numerous trees and power lines were blown down in western North Carolina with a large number of power outages as a result. The gradient wind caused considerable damage in the foothills and piedmont as the front moved through.
9/6/1996	The fringes of Hurricane Fran caught the Piedmont with high winds especially in the eastern parts of these counties. A number of trees were downed with some power outages as a result. Some of the trees fell on structures. Damage was quite light compared with areas to the east.
2/24/1998	High gradient winds in the wake of an existing strong storm system combining with saturated soil conditions to blow down some trees and power lines across the foothills and piedmont.
3/3/1999	High winds, gusting between 50 and 70 mph, occurred just ahead of a strong cold front. The winds were mostly gradient, but convectively boosted in some cases. Most of the damage occurred in the piedmont where mobile homes and other structures were damaged. Numerous trees and power lines were downed as well.
3/28/2000	High winds following a cold front caused a number of problems during the afternoon. Numerous trees and power lines were downed and some light structural damage occurred. Several thousand people were without power for a while too. A man was injured when a wall toppled over onto him in Concord. Streets were blocked by the downed trees and power lines in Charlotte.
2/16/2001	A strong cold front crossed the region on the 16th, accompanied by gusty winds. Persistent high gradient winds following the frontal passage resulted in downed trees and power lines. Some of the resulting power outages were long-lived, and there was even some structural damage reported.
2/4/2002	High winds, mostly in the form of gusts rather than sustained winds, blew down a number of trees and some power lines during the afternoon and early evening. A number of brush fires were reported around the Charlotte metro area. Some trees blocked roads and some fell on structures. In Statesville, a limb fell on a power line, which in turn caused a house fire. In Cleveland, a sign was blown out of a fast food restaurant. In Rowan, a roof was blown off of an abandoned mobile home.
3/7/2004	As the cold front moved into the piedmont, wind damage continued and became more severe. Numerous trees and power lines were blown down, while roofs were torn off of some buildings. Some outbuildings and barns were damaged or destroyed. In Mecklenburg County, an 81-year-old man was killed in Huntersville, when a tree fell across the deck on which he was standing.
4/16/2007	After an intense, but relatively brief high wind event affected the mountains and foothills on the evening of the 15th, another widespread damaging high wind event developed during the day of the 16th. However, this particular event included much of the piedmont. Thousands of trees fell across the area, resulting in widespread power outages. Numerous trees fell on roads, homes, and vehicles. The Blue Ridge mountains and the foothills received the brunt of the strongest winds. In Highlands, NC, two homes were heavily damaged by fallen trees, while approximately 100 homes received minor to moderate damage. A tree fell on and severely damaged a home in Otto, NC. Two businesses received significant roof damage in Cashiers, NC. Three contruction workers were injured in Mount Holly when an inflatable structure collapsed at a constructions site. Five homes were damaged by fallen trees in Lincoln County, NC alone. Three homes were damaged in Iredell County and in In Catawba County, a 30-foot brick wall on top of a building in Newton was blown down, while sections of a metal roof were torn off a business in Viewmont.

2/10/2008	As the polar vortex dropped into New England, an unusually tight gradient developed over western North Carolina. This gradient, combined with daytime heating, helped to mix down areas of strong winds during the afternoon hours. Numerous trees were reported down across the foothills and western Piedmont, some across roads and on homes. The gusty winds combined with ongoing drought conditions to produce numerous brush fires across the area during the afternoon.
Stanly County	
2/16/1998	Strong winds with gusts to 35 mph were common across central North Carolina during the night of the 16th and into the morning hours of the 17th. The strongest gust was recorded at Goldsboro (52 mph). Several trees were downed in almost all of the counties in central North Carolina from Winston-Salem to Raleigh/Durham to Goldsboro and Rocky Mount. A combination of the wind and very soggy soils led to many of the trees to fall. Several homes were damaged in Sampson, Wayne, Wake, and Cumberland counties.
3/7/2004	High winds just behind a fast-moving cold front produced extensive damage across central North Carolina. In addition to trees and powerlines being blown down, numerous structures sustained damage. A small airplane was blown over at RDU airport, and a portion of Terminal A was damaged. Trailers were turned over and roofs were blown off many buildings. Measured wind gusts were as high as 74 mph. Over 50,000 power outages were reported.
2/10/2010	Numerous trees were blown down countywide blocking many roads and highways. Widespread power outages were caused by the falling trees along with some minor property damage to roofs and small buildings.
Union County	
9/6/1996	The fringes of Hurricane Fran caught the Piedmont with high winds especially in the eastern parts of these counties. A number of trees were downed with some power outages as a result. Some of the trees fell on structures. Damage was quite light compared with areas to the east.
2/24/1998	High gradient winds in the wake of an exiting strong storm system combining with saturated soil conditions to blow down some trees and power lines across the foothills and piedmont. Some trees fell on structures and a steeple was blown off a church in Casar (Cleveland county).
9/15/1999	A tight pressure gradient between powerful Hurricane Floyd across eastern North Carolina and strong high pressure over the Ohio Valley and Great Lakes pulled cooler and very dry air south across the mountains and foothills of North Carolina on strong north winds. Henderson and Transylvania counties were particularly hard hit as winds gusting over 50 mph at times downed numerous trees and power lines - some on homes and vehicles. A person was injured in a car while driving near Zirconia when a tree fell on the vehicle. A large tent providing shelter at a fair in Henderson county was damaged. Numerous brush fires that started were fanned by the high winds. The Asheville Regional airport reported winds sustained at 45 mph with gusts to 54 mph around 9 am EST on the 16th. The wind abated in the mountains around noon. Farther east, especially near and east of Interstate 77, winds more directly associated with Hurricane Floyd caused scattered damage. Winds gusting between 35 and 45 mph downed some trees and power lines. Trees fell on structures in Bessemer City and Gastonia. A warehouse under construction in Lowesville (Lincoln county) was destroyed.
2/4/2002	High winds, mostly in the form of gusts rather than sustained winds, blew down a number of trees and some power lines during the afternoon and early evening. A number of brush fires were reported around the Charlotte metro area. Some trees blocked roads and some fell on structures. In Statesville, a limb fell on a power line, which in turn caused a house fire. In Cleveland, a sign was blown out of a fast food resteraunt. In Rowan, a roof was blown off of an abandoned mobile home.
3/7/2004	As the cold front moved into the piedmont, wind damage continued and became more severe. Numerous trees and power lines were blown down, while roofs were torn off of some buildings. Some outbuildings and barns were damaged or destroyed. In Mecklenburg County, an 81-year-old man was killed in Huntersville, when a tree fell across the deck on which he was standing.

12/10/2008	A localized area of intense winds developed across the Piedmont during the early evening in association with a small area of low pressure. Numerous trees and power lines were blown across the southern part of Union County in North Carolina, with the wind damage extending southward into the northwest Piedmont of South Carolina.
2/24/2016	Very strong west/northwest winds developed across the portions of the northern foothills and western Piedmont during the afternoon in the wake of a cold front. Numerous trees were blown down across the area, some of which fell on and took down power lines, resulting in scattered power outages. Some minor roof damage also occurred, including sections of roof peeled off small businesses in Lowell (Gaston County) and Shelby (Cleveland County) and off a mobile home near Love Valley (Iredell County).

TABLE H.9: ICE STORM EVENTS (1996-2024)

Date	Description
Cabarrus County	
2/2/1996	Rain began to freeze in the southern foothills and most of the piedmont. Bridges and overpasses quickly became icy with numerous problems reported on highways and streets. Rain was falling so heavily that not much was accumulating as ice. However, by about noon, ice storm conditions began to develop quickly with numerous power outages reported. Areas west and north of Charlotte were hardest hit. Damage estimates for this major ice storm are a broad estimate and not reliable. Road repair/cleanup costs in North Carolina exceeded $20 million. Numerous traffic accidents caused many injuries and some indirect fatalities.
12/24/1998	Freezing rain accumulated to damaging levels around midnight and by morning there were numerous power outages reported due to downed trees and power lines. Road problems were mostly limited to bridges and overpasses.
1/29/2000	Weakening low pressure in the Ohio River Valley, developing low pressure along the Gulf Coast and cold, arctic air in place across the Carolinas resulted in a wintry mess across western North Carolina. This was the last in a series of 5 winter storms that wreaked havoc on western North Carolina in an 11-day span. The ice storm in the mountains consisted mainly of a couple inches of sleet. However, the combined accumulation of the mixture of sleet and snow was generally 2 to 3 inches. Some freezing rain mixed in during the morning of the 30th. Across the foothills and piedmont, precipitation which briefly began as some light sleet and snow, turned quickly to freezing rain. The freezing rain was heavy enough across the southern piedmont, including the Charlotte area, to result in a 1/4 to 1/2-inch glaze. Scattered power outages resulted, with Gaston county reporting 2500 people without power. The entire Duke Power system reported 77,000 people without power.
12/4/2002	Freezing rain began over the extreme southern mountains of North Carolina during the early afternoon on the 4th, and had spread into the southwest piedmont by midafternoon. Resultant damage due to ice accumulation began during the mid-to-late afternoon. The intensity of the freezing rain increased after midnight, and by sunrise on the 5th, devastating ice accumulations of 1/2 to 1 1/2 inches were observed. The hardest hit area was Charlotte metro. Hundreds of thousands lost power, and the outages lasted for as long as 2 weeks in some areas.
Stanly County	
1/6/1996	
1/11/1996	
2/2/1996	
12/23/1998	An ice storm began during the afternoon of 12/23/98 and continued through the early morning hours on 12/25/98. Most of the precipitation fell in the form of freezing rain across central North Carolina causing power outages to approximately 500,000 people sometime during the period. The most severe ice accumulations were found in a southwest to northeast band across central North Carolina. This band extended from near Albemarle in Stanly county, northeast through the Asheboro area in Randolph county, and continued northeast to Raleigh/Durham and Halifax. Accumulations from 1/2 to 1 inch of ice occurred in these areas. With temperatures in the mid-20s, this made travel conditions nearly impossible on the night of the 23rd.
Union County	
2/2/1996	Rain began to freeze in the southern foothills and most of the piedmont. Bridges and overpasses quickly became icy with numerous problems reported on highways and streets. Rain was falling so heavily that not much was accumulating as ice. However, by about noon, ice storm conditions began to develop quickly with numerous power outages reported. Areas west and north of Charlotte were hardest hit. Damage estimates for this major ice storm are a broad estimate and not reliable. Road repair/cleanup costs in North Carolina exceeded $20 million. Numerous traffic accidents caused many injuries and some indirect fatalities.

2/13/1997	A winter storm brought a variety of weather woes to western and central North Carolina. Snow in the mountains gradually became heavy as it spread east with the highest accumulations in the higher elevations west and north of Asheville. Four to six inches fell with similar amounts in the mountainous parts of the foothill counties. Several inches fell in parts of the piedmont with up to 3 1/2 inches around Cherryville. In the foothills and piedmont, the snow changed to a sleet storm during the afternoon with several inches accumulations. Around Charlotte and Monroe freezing rain during the evening caused scattered power outages.
1/23/2000	A cold dome of arctic high pressure centered over the Mid-Atlantic States provided very cold and dry air to western North Carolina. Meanwhile, weak low pressure moved east along a frontal boundary stalled across the Gulf Coast States to the Georgia coast. Abundant moisture flowed north into the sub-freezing air over western North Carolina, resulting in light snow as early as the afternoon on the 22nd. Snow became heavy by mid-afternoon across the mountains and by evening across the foothills and piedmont. A general 4 to 7-inch snowfall occurred in the mountains with as much as 10 inches reported in Jackson county. Generally, 4 to 6 inches of snow fell across the foothills and piedmont. Freezing rain and sleet mixed with the snow for a short time before the precipitation ended, and for the most part, caused little additional problems. The one exception was across southern Union county where freezing rain lasted all night and through much of the morning on the 23rd. Ice accumulations reached damaging levels there around 3 am, causing a large number of trees and power lines to fall throughout the morning. This in turn, resulted in widespread power outages.
1/29/2000	Weakening low pressure in the Ohio River Valley, developing low pressure along the Gulf Coast and cold, arctic air in place across the Carolinas resulted in a wintry mess across western North Carolina. This was the last in a series of 5 winter storms that wreaked havoc on western North Carolina in an 11-day span. The ice storm in the mountains consisted mainly of a couple inches of sleet. However, the combined accumulation of the mixture of sleet and snow was generally 2 to 3 inches. Some freezing rain mixed in during the morning of the 30th. Across the foothills and piedmont, precipitation which briefly began as some light sleet and snow, turned quickly to freezing rain. The freezing rain was heavy enough across the southern piedmont, including the Charlotte area, to result in a 1/4 to 1/2-inch glaze. Scattered power outages resulted, with Gaston county reporting 2500 people without power. The entire Duke Power system reported 77,000 people without power.
12/4/2002	Freezing rain began over the extreme southern mountains of North Carolina during the early afternoon on the 4th, and had spread into the southwest piedmont by midafternoon. Resultant damage due to ice accumulation began during the mid-to-late afternoon. The intensity of the freezing rain increased after midnight, and by sunrise on the 5th, devastating ice accumulations of 1/2 to 1 1/2 inches were observed. The hardest hit area was Charlotte metro. Hundreds of thousands lost power, and the outages lasted for as long as 2 weeks in some areas.
1/16/2022	Moisture overspread the southern North Carolina Piedmont early on the 16th as strengthening low pressure moved across the Deep South. Precipitation began as rain or a mix of rain and sleet across much of this area shortly after midnight, but with strong northeast winds at the surface supplying ample cold air, while temperatures aloft stayed relatively warm, precipitation transitioned to sleet and then freezing rain across much of this area during the overnight. The freezing rain tapered off during early afternoon, but periods of snow showers developed later in the afternoon into the evening, producing spotty light accumulations. Total ice accretion of one quarter to less than one half inch was reported, along with less than an inch of sleet and snow.

TABLE G.10: LIGHTNING EVENTS (1996-2024)

Location	Date	Description
Cabarrus County		
KANNAPOLIS	8/24/1996	
COUNTYWIDE	7/15/1997	Thunderstorms developed in the foothills and western piedmont of North Carolina during the afternoon. A couple became severe producing damaging winds which downed trees in Rowan county and large hail on the east side of Hickory. Persistent lightning in Cabarrus county resulted in countywide power outages for 4 hours.
COUNTYWIDE	7/20/1998	An isolated severe thunderstorm in Waynesville downed numerous limbs and power lines. One thousand people power lost power as well. A cluster of thunderstorms moved from northern Cleveland county, east-southeast and became severe in the eastern portions, downing numerous trees. This cluster of severe thunderstorms moved across Gaston county, continuing to down trees and some power lines and leaving 6500 people without power for a while. The storms then moved into southern Mecklenburg county, blowing down 6 trees on the southwest side of Charlotte. Intense cloud to ground lightning from these storms that became nearly stationary struck 15 dwellings ranging from apartments to condominiums to houses in the Charlotte area. Damage was estimated near 1 million dollars as many homes were destroyed. Flash flooding occurred in South Charlotte late in the evening and continued into the early morning hours. One injured woman had to be rescued from her auto on South Blvd by a firefighter. Another cluster of severe thunderstorms developed west into Cabarrus county, producing numerous microbursts that downed trees and power lines as they moved slowly south over the course of an hour and fifteen minutes. Especially hard hit was the area from Concord into the southern and eastern portions of the county. The storms eventually moved into Union county and produced dime size hail west of Monroe. Lightning strikes also caused several house fires in Iredell, Cabarrus and Union counties until late in the evening. One house in Union county was a total loss.
HARRISBURG	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
HARRISBURG	6/15/2001	LIghtning caused a house fire, resulting in serious damage.
GLASS	8/5/2009	Lightning struck a home on Summit Ridge Ln, causing extensive damage.
KANNAPOLIS	3/30/2012	Lightning struck a vacant home near the intersection of Hilltop Ave and Pine St, starting a fire that destroyed the structure.
ROCKY RIVER	7/1/2012	Lightning started a fire at a home on Thistle Down Dr, heavily damaging the structure.
HARRISBURG	7/26/2016	Media reported a worker at the Charlotte Motor Speedway was injured when lightning struck a fence that he was touching.
Stanly County		
COUNTYWIDE	8/28/1997	LIGHTNING HIT SEVERAL FARM BUILDINGS IN THE COUNTY. MOST OF THE BUILDINGS WERE IN THE LOCUST AND STANFIELD AREAS. AT LEAST THREE OUTBUILDINGS WERE HIT AND DESTROYED.
NORWOOD	6/23/2006	
ALBEMARLE	7/27/2009	Lightning resulted in several house fires from Albemarle to New London. The entire town of Albermarle was without power.
ALBEMARLE	8/19/2010	A lightning strike caused a house fire in Albemarle. Fire fighters was able to contain the fire to the attic.

Union County		
MONROE	4/29/1996	
MONROE	4/29/1996	Morning thunderstorms caused lightning strikes which partially burned two houses.
MONROE	7/30/1996	
MONROE	8/24/1996	Severe thunderstorms swept from the foothills through much of the piedmont causing widespread reports of large hail and damaging wind. Trees were blown down in all locations where wind damage was listed above and in Iredell county a tree crushed a mobile home. Power was out in much of the area. In Charlotte excessive rainfall caused flash flooding. The worst flooding was reported along Independence Avenue where at least one car dealership flooded. Thirty one cars were damaged or destroyed. Lightning caused power outages to 1000 homes around Concord and partially burned a home near Shelby. At Monroe lightning struck two trees, ran through a carport, cracked the wall of a house and injured one woman.
WINGATE	6/10/1998	A warm front pushing north through western North Carolina helped initiate heavy rain and severe thunderstorms during the morning of the 10th. Many reports of trees down and large hail were received from the western piedmont. A car was blown off the road near Kings Creek. Chicken houses were damaged near Taylorsville allowing ten thousand chickens to run free. Numerous trees were uprooted in Monroe and wind blown golf ball size hail broke windows and damaged cars. Heavy rain in a short period of time resulted in some urban flooding from the Belmont and Mount Holly areas, to the south side of Charlotte. Numerous roads were flooded and several motorists required rescue in different parts of the city. Lightning severely damaged a church in Millersville, but no damage estimate was available. Several homes were struck by lightning in the Charlotte area, causing extensive damage. In Wingate, one house was severely damaged and two others minorly damaged by lightning. Lastly, a lightning strike in Highlands ignited a fire that burned a large house and its contents, including a Corvette. No damage estimates were given.
COUNTYWIDE	7/20/1998	An isolated severe thunderstorm in Waynesville downed numerous limbs and power lines. One thousand people power lost power as well. A cluster of thunderstorms moved from northern Cleveland county, east-southeast and became severe in the eastern portions, downing numerous trees. This cluster of severe thunderstorms moved across Gaston county, continuing to down trees and some power lines and leaving 6500 people without power for a while. The storms then moved into southern Mecklenburg county, blowing down 6 trees on the southwest side of Charlotte. Intense cloud to ground lightning from these storms that became nearly stationary struck 15 dwellings ranging from apartments to condominiums to houses in the Charlotte area. Damage was estimated near 1 million dollars as many homes were destroyed. Flash flooding occurred in South Charlotte late in the evening and continued into the early morning hours. One injured woman had to be rescued from her auto on South Blvd by a firefighter. Another cluster of severe thunderstorms developed west into Cabarrus county, producing numerous microbursts that downed trees and power lines as they moved slowly south over the course of an hour and fifteen minutes. Especially hard hit was the area from Concord into the southern and eastern portions of the county. The storms eventually moved into Union county and produced dime size hail west of Monroe. Lightning strikes also caused several house fires in Iredell, Cabarrus and Union counties until late in the evening. One house in Union county was a total loss.
MARSHVILLE	7/29/1999	A severe thunderstorm downed trees in downtown Charlotte in the Charlotte Plaza. A lightning strike in Marshville sparked a blaze which destroyed a house.
MONROE	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown

		down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
MONROE	4/1/2001	Emergency management reported 2 large oak trees down. One tree fell on a horse trailer, the other on a house. The roof was torn off a small building. There was also some structural damage to a separate home, one house fire and one brush fire was started from lightning.
WEDDINGTON	7/29/2003	A person was injured when he was struck by lightning.
WEDDINGTON	8/14/2003	Flash flooding developed first in Indian Trail on the evening of the 14th, and quickly expanded to Weddington and Stallings. Twelve Mile Creek, which is normally 2 feet wide, overflowed its banks and expanded to a width of 50 feet, flooding Forest Lawn Dr. Numerous homes were threatened by flood water, and 16 homes received at least minor water damage. Some motorists and residents required rescue from their vehicles and homes. Several homes were also struck by lightning.
INDIAN TRAIL	8/16/2003	Two people were struck by lightning.
MONROE	5/23/2004	Lightning ignited some structural fires.
MONROE	7/19/2005	Lightning struck a home, igniting a fire which completely destroyed the structure and its contents.
WEDDINGTON	7/21/2009	Lightning struck a home, igniting a fire that destroyed much of the structure.
MINERAL SPRINGS	8/20/2009	Lightning struck a large home on Pimlico Ln, igniting a fire that caused enough damage to render the home uninhabitable.
MINERAL SPRINGS	4/9/2011	Lightning ignited a fire which damaged much of a home in Mineral Springs.
MONROE	8/2/2012	Lightning struck a tree on Church St, which fell on and damaged two vehciles.

TABLE H.11: SLEET EVENTS (1998-2024)

Date	Description
Cabarrus County	
12/23/1998	Freezing rain and sleet developed early Wednesday morning and persisted through the morning of Christmas Eve. These areas would receive enough glaze by Christmas Eve morning to cause damage.
3/9/1999	Light snow and sleet fell during the morning, associated with a strong low-pressure area moving north through the Mississippi River Valley. Accumulations by noon ranged between 1 and 3 inches. Some light freezing rain mixed in from time to time as well.
2/16/2003	A light freezing rain developed over the piedmont and foothills of North Carolina during the early morning hours. By mid-morning, the precipitation began to intensify, and a transition to sleet occurred. The sleet accumulated rapidly to a depth of 1 inch in most locations, while periods of afternoon, evening, and overnight sleet increased total accumulations to around 2 inches in most areas. Numerous traffic accidents and road closures resulted.
1/25/2004	During the early afternoon, snow began to mix with sleet across the foothills and northern piedmont, before becoming all sleet later in the evening. In the southern piedmont, precipitation fell almost exclusively as sleet. Total sleet accumulations were generally between 1 and 2 inches across the area. A light freezing rain developed during the evening, which resulted in a thin glaze of ice on top of the layer of sleet. Very slick roads were responsible for hundreds of traffic accidents, some of which involved injuries and fatalities. Numerous injuries also occurred due to falls.
Union County	
12/23/1998	Freezing rain and some sleet developed early Wednesday morning and persisted through the morning of Christmas Eve. Some areas later received enough glaze to cause damage.
2/16/2003	A light freezing rain developed over the piedmont and foothills of North Carolina during the early morning hours. By mid-morning, the precipitation began to intensify, and a transition to sleet occurred. The sleet accumulated rapidly to a depth of 1 inch in most locations, while periods of afternoon, evening, and overnight sleet increased total accumulations to around 2 inches in most areas. Numerous traffic accidents and road closures resulted.
1/25/2004	During the early afternoon, snow began to mix with sleet across the foothills and northern piedmont, before becoming all sleet later in the evening. In the southern piedmont, precipitation fell almost exclusively as sleet. Total sleet accumulations were generally between 1 and 2 inches across the area. A light freezing rain developed during the evening, which resulted in a thin glaze of ice on top of the layer of sleet. Very slick roads were responsible for hundreds of traffic accidents, some of which involved injuries and fatalaties. Numerous injuries also occurred due to falls.

TABLE H.12: TORNADO EVENTS (1950-2024)

Location	Date	Description
Cabarrus County		
Unincorporated Area	7/27/1950	
Unincorporated Area	11/28/1954	
Unincorporated Area	7/25/1965	
Unincorporated Area	5/28/1973	
Unincorporated Area	5/28/1973	
Unincorporated Area	6/6/1975	
Unincorporated Area	8/23/1983	
Unincorporated Area	3/10/1992	
CONCORD	5/14/2006	The tornado briefly touched down along Cline School Rd in the Rimer community. Damage was mainly confined to downed trees, although the roof was torn off a barn. Power lines were also blown down in the area.
WEST CONCORD	5/11/2008	A tornado touched down briefly near the intersection of highway 49 and highway 601.
WATTS XRDS	12/11/2008	This tornado developed just south of the intersection of Mount Pleasant Rd North and Gold Hill Rd, where part of the roof and southwest side wall of a barn were lifted and tossed 20 to 30 yards. The tornado continued almost due north, roughly paralleling Mount Pleasant Rd, knocking a mobile home 5-10 feet off its foundation on Gold Hill Rd. The tornado continued its intermittent track to the north toward Klutz Rd, where a barn received some minor roof damage and a large hardwood tree snapped off and destroyed a travel trailer. The south side of a barn was torn off and lifted just north of Klutz Rd, with debris scattered up to 100 yards north of the structure. The tornado lifted shortly after this damage occurred. In addition to the structural damage, quite a few trees were snapped off or uprooted along the 2.5 mile track.
HARRISBURG	3/3/2012	This tornado moved into Cabarrus County from Mecklenburg County, south of Harrisburg and west of the Robinson Church Rd and Peach Orchard Rd intersection. The tornado affected several residential areas, damaging around 30 homes and destroying two homes which slid off their foundations. The tornado crossed Robinson Church Rd and Peach Orchard Rd, lifting just short of Hickory Ridge Rd.
GLASS	10/22/2019	Emergency manager reported a brief, weak tornado developed in the Davidson Rd/Sudbury Rd area of Davidson in extreme northwest Cabarrus County. Damage was primarily limited to multiple uprooted trees and at least one snapped tree. Some beehives were also overturned.
MT GILEAD	2/6/2020	NWS storm survey found the damage path of an EF2 tornado that began just west of I-85 near Lane St where trees were snapped and uprooted as the tornado crossed the interstate and moved east along Lane St. The awning of a service station was also damaged. The tornado then moved along Old Salisbury-Concord Rd snapping and uprooting trees until it reached Gold Fish Rd where several homes were damaged. The tornado then moved east along Irish Potato Rd snapping and uprooting trees. Farther along this road another home was damaged. Little damage was noted as the tornado moved east until it crossed Dutch Buffalo Creek where trees were snapped and

		uprooted. The strongest damage was found just east along Pless Rd where several homes were damaged. The tornado weakened as it moved east snapping and uprooting trees as it went. The tornado ended near Sisk-Carter Rd.
HARRISBURG	5/23/2022	NWS storm survey found that a tornado that began in the Reedy Creek community of Mecklenburg County moved northeast into Cabarrus County just east of I-485 and just north of Rocky River Rd. The tornado continued northeast, crossing Robinson Church Rd, Hickory Ridge Rd, and Stallings Rd before lifting near the intersection of Rocky River Rd and Hearth Lane Southwest. Damage in Cabarrus County was primarily limited to numerous snapped tree limbs and small trees and uprooted larger trees, although minor structural damage was also observed and a vehicle was flipped.
Stanly County		
Unincorporated Area	5/17/1963	
Unincorporated Area	12/31/1975	
Unincorporated Area	10/9/1976	
Unincorporated Area	11/4/1977	
Unincorporated Area	4/27/1982	
Unincorporated Area	5/5/1989	
Unincorporated Area	6/16/1989	
Unincorporated Area	3/29/1991	
LOCUST	9/29/1999	A tornado touched down briefly and took the entire roof off a brick ranch. No other damage was noted in the area. A spotter was tracking the funnel.
ALBEMARLE	9/29/1999	A second tornado, spawned by another thunderstorm, dropped a tornado 6 miles west of Albemarle. It destroyed a modular home, then did serious damage to the roof of a church. Several large trees were also taken down in the area. This was near the community of Lambert. The tornado then produced sporadic tree and roof damage on its way to the southern part of Albemarle. Several businesses were then heavily damaged, and a lock and store facility was destroyed. The tornado then apparently dissipated.
MILLINGPORT	9/5/2011	The National Weather Service in Raleigh has confirmed that an EF-0 tornado touched down south of the Richfield area in Stanly County. The first touchdown occurred immediately south of Rogers Road where a swath of downed trees and power lines 100 yards across were located. The tornado continued northward tearing the roof off of four wooden outbuildings with metal sheet roofing. Two of the buildings were completely destroyed while the other two were intact despite considerable roof damage. Debris from these buildings was scattered for 200-300 yards in a circular pattern. Debris also included half inch-thick metal fencing that had been twisted and displaced one hundred yards. Many trees were snapped off near their bases. Beyond the outbuildings of the farm, the tornado continued northward, briefly lifting north of Sunnybrook Road. | |Another brief touchdown was noted approximately 3 miles to the north and produced damage to several trees at a residence along NC Highway 49. Touchdown occurred south of Highway 49, continued across the road and lifted near the residence at 22221 Highway 49 just north of the road. No structural damage was found at this location.
COTTONVILLE	5/11/2019	The tornado touched down near Plank Rd, just west of the intersection with Aldridge Rd. Large branches were broken and small trees were snapped on the northern side of Plank Rd. The tornado then moved southeast into the town of Cottonville, where |large trees

		were uprooted and snapped. At the intersection between Plank Rd and Hardy Rd, the tornado appeared to reach maximum intensity, with numerous trees uprooted and some trees snapped at the trunk. The tornado then continued east along Hardy Road, with minor structural damage noted to farm outbuildings consistent with EF-0 damage. It then lifted and dissipated, as no further significant damage was evident.
MILLINGPORT	2/6/2020	An EF-1 tornado with maximum wind speeds of 110 mph touched down west of Albemarle. A discontinuous damage path started along Flint Ridge Road approximately two miles southwest of Millingport. The damage there consisted of a double-wide manufactured home that had the roof completely removed and shifted off of its foundation. A large storage outbuilding at the same location was completely destroyed. In addition, there was a long and narrow patch of substantial tree damage consisting of both uprooted and snapped hard and softwood trees. This type of damage was noted in numerous locations along Biles Road. The tree damage continued east of Biles Road after crossing Millingport Road. The damage path was picked back up along Pennington Road, where a childcare center had considerable roof damage and numerous surrounding tree damage. A large swath and path of trees damage continued to the northeast, before the damage mostly ended around Snuggs Park Road.
ST MARTIN	5/3/2021	A very brief EF-0 tornado touch down occurred during the afternoon of May 3, 2021, approximately 4 miles northeast of Oakboro in Stanly County, just off of Little Creek Road. Damage consisted of several snapped and uprooted trees, and a chicken house that was completely blown down and blown away. The tornado was confined to a very brief period, or approximately one or two minutes, which corresponds to one volume scan on the Charlotte TCLT radar where a gate-to-gate rotational couplet was noted in conjunction with the primary damage location.
COTTONVILLE	3/31/2022	The tornado tracked from Anson County across the Rocky River into Stanly County near Plank Road. The tornado continued to track northeastward and across mostly rural southern Stanly County before lifting after 3 miles. The tornado caused mostly tree damage and blew a roof of a residents around on Hardy Road near Mount Zion Church Road, shortly before it lifted.
Union County		
Unincorporated Area	5/14/1950	
Unincorporated Area	4/18/1969	
Unincorporated Area	8/1/1970	
Unincorporated Area	3/24/1975	
Unincorporated Area	7/15/1976	
Unincorporated Area	7/12/1977	
Unincorporated Area	6/6/1978	
Unincorporated Area	5/18/1980	
Unincorporated Area	3/6/1983	
Unincorporated Area	3/28/1984	
Unincorporated Area	5/24/1988	

Unincorporated Area	5/5/1989	
Unincorporated Area	10/18/1990	
Stallings	4/12/1995	Two miles south of Stallings, on Chestnut Road, a small tornado produced significant damage to a barn and a large outbuilding. The roof on a small local business also received damage. Numerous trees were blown down. One injury occurred when the wind slammed a door on a resident's hand.
MONROE	4/13/1996	A tornado touched down briefly and caused significant damage to a house, destroyed several outbuildings, damaged a mobile home, and blew down a few trees. The damage was surveyed the next day and convergent rotary wind damage was quite evident. The funnel was observed as it approached the residence.
MONROE	7/4/2001	A “gustnado" formed along a gust front ahead of a line of thunderstorms. The small tornado destroyed a 70 X 70 barn by lifting its roof and carrying it 100 yards and dropping it to the ground. A refrigerator inside the barn had its door removed and a large post
BAKERS	4/16/2011	An area of weak tornado damage began on the north side of Monroe, just west of highway 74 along Williams Rd. Part of the metal roof was blown off a building and some trees were blown down here. The tornado skipped northeast across highway 74 and damaged some outbuildings and blew out the plastic roof covering of an outdoor garden center. The tornado continued northeast, blowing down a few trees as it approached Secrest Shortcut Rd. Part of an outbuilding was destroyed just west of Red Fox Run Rd. The tornado continued over Secrest Hill Dr and Barbee Farm Dr, uprooting pine trees, snapping small trees and causing minor structural damage to homes. As the tornado continued northeast, it may have lifted briefly near Maple Hill Rd before touching down again near the intersection of Ridge Rd and Concord Highway. The metal roof of an outbuilding was tossed about 100 yards and some trees uprooted in a wooded area at this location. The tornado appeared to lift shortly thereafter, just before the intersection of Concord highway and Sikes Mill Rd.
UNIONVILLE	9/5/2011	This brief, weak tornado touched down at a farm site just southwest of the intersection of Ridge Rd and C.J. Thomas Rd. The tornado traveled around one-half mile before lifting near Bernard Thompson Rd. A few barns received roof damage and some trees were blown down.
ALTON	12/28/2015	NWS Storm Survey found the path of a brief, weak tornado that touched down along Jug Broome Rd south of Monroe and moved northeast for less than a mile before lifting along E Sandy Ridge Rd. Five sheds and outbuildings were damaged or destroyed and multiple trees downed. The wall of one home sitting on concrete blocks was shifted about one foot. Additionally, a camper was rolled on its side.
ALTON	5/24/2017	NWS storm survey found a weak tornado tracked northeast from Lancaster County, SC into Union County in a rural area west of South Rocky River Rd. Two walls and much of the roof was blown off a barn off in this area, which was the most significant damage associated with the tornado. Otherwise, damage was primarily confined to numerous downed trees, damage or destruction to multiple outbuildings, and minor structural damage to multiple homes as the tornado tracked northeast, lifting near Joe Collins Rd.
INDIAN TRAIL	2/6/2020	A weakening tornado moved into Union County from Mecklenburg County near Idlewild Rd. Damage in Union County was generally confined to downed weakened and dead trees before the tornado lifted near Hawthorne Drive in Indian Trail.

TABLE H.13: THUNDERSTORM EVENTS (1995-2024)

Location	Date	Description
Cabarrus County		
Randolph	7/6/1995	Several reports of trees down.
Stanly	7/6/1995	Trees were knocked down.
Granville	7/6/1995	Trees down on Beltown Road.
Person	7/6/1995	Trees were knocked down.
CONCORD	4/30/1996	An area of severe thunderstorms moved across the Charlotte metro area causing scattered wind damage. A roof was blown off a business in the south part of town and trees and power lines were downed. Trees and power lines were also blown down near Concord and Monroe.
HARRISBURG	5/11/1996	
CONCORD	5/11/1996	Severe thunderstorms moved northeast across the Piedmont. Numerous trees and power lines were downed all along this path. A second swath of damage began along the Rowan/Cabarrus county line. Numerous trees were downed in the Spencer/East Spencer area. A large number of homes were damaged by downed trees and power lines. Sheds were blown away and some light structural damage occurred. In Granite Quarry similar damage was reported with roofs of carports and garages blown off. These damage paths extended to High Rock Lake. Two fatalities were reported on the lake but these were not related to the storm.
CONCORD	5/28/1996	A squall line, plus one or two isolated severe storms, moved from South Carolina into the North Carolina foothills and piedmont. Damage was mostly limited to downed trees and power lines but light structural damage was reported. In northern Mecklenburg county some outbuildings were destroyed and a farm animal killed. Trees fell onto homes near Shelby and power was out for thousands of customers all night.
MIDLAND	6/20/1996	A tree fell during a severe thunderstorm and destroyed a mobile home.
CONCORD	7/15/1996	Severe thunderstorms developed along the foothills and piedmont and became more powerful as they moved east. Trees were blown down in areas listed above and east of Troutman underpinning was blown out from under a mobile home. Roofs of houses, outbuildings and a garage were destroyed by the wind in this same area. Power outages were common. Up to 10,000 customers were without power. Some trees fell on cars and houses.
HARRISBURG	8/3/1996	Thunderstorms produced some flooding in the mountains where several bridges were flooded out. Winds gusts were estimated to 50 knots at Hot Springs by an employee of NCDC. A steady state thunderstorm moved across northern Mecklenburg county leaving quite a bit of damage to homes resulting from downed trees. Wind and hail damage was likely more than the $50,000 listed above. The storm had weakened considerably by the time it reached Harrisburg but was still strong enough to blow down a few trees. Lightning severely damaged a home at Hickory.
MIDLAND	4/27/1999	A backdoor cold front moving southwest across the western piedmont of North Carolina and a warm front moving north across the mountains provided the focus for strong to severe thunderstorm activity during the afternoon and evening. The severe thunderstorms produced mainly large hail ranging in size between dimes and half dollars. However, there was one report of damaging winds which blew down trees late in the evening in Cabarrus county.
KANNAPOLIS	7/24/1999	Clusters of slow-moving thunderstorms developed during the afternoon on another hot and humid summer day. Some of the storms became severe,

		producing large hail the size of nickels and quarters, and straight-line winds which downed numerous trees. In Kannapolis, the roof of a commercial building was blown off. The Gastonia area experienced a severe thunderstorm which lasted nearly an hour. Numerous trees and power lines were downed, some of which fell on a trailer and homes. Urban flooding in normally flood-prone areas stranded a few cars and lightning strikes caused several house fires. In rural areas around Monroe, small streams briefly came out of their banks and flooded typical flood-prone areas.
HARRISBURG	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
CONCORD	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
MT PLEASANT	9/9/1999	A line of thunderstorms crossed the foothills and piedmont during the afternoon, producing a large amount of lightning, gusty winds and hail. A few storms became severe briefly as they produced dime size hail or damaging wind. A large oak tree was downed across power lines on Sherrills Ford Road west of Salisbury. Another tree was blown down and blocked a lane on Interstate 85 near Spencer. Three trees were downed in the Mt Pleasant vicinity and one house under construction was destroyed when collapsed by the wind. A combination of lightning activity and gusty winds near 50 mph at times caused scattered power outages and trees limbs to fall. These reports came mainly from southern Cleveland county through western Lincoln county and into Catawba county.
MT PLEASANT	9/29/1999	A weak boundary and a favorable shear profile was sufficient to produce 3 supercell thunderstorms in a row which tracked east northeast across the Charlotte metro area and through Cabarrus County. Funnel clouds were observed with 2 of the storms across extreme eastern Cabarrus county. About 4 miles north of where one of the funnel clouds was seen, the severe thunderstorm produced damaging wind which blew down a half dozen trees. Flash flooding developed in the same areas of eastern Cabarrus county due to the repeat thunderstorms. Some roads were washed out and several major intersections were flooded.
MIDLAND	5/19/2001	At least three trees down, one on a power line.
CONCORD	8/18/2001	A few trees and power lines brought down southeast of town, along NC Highway 24/27 and on Reed Mine Road.
MT PLEASANT	4/22/2006	
CONCORD	6/10/2006	Numerous trees down, some on homes and power lines, from the city to the area near Flowes Store Rd and Highway 601.
CONCORD	6/12/2006	Seven power poles blown down along Pitts School Rd. A barn was blown down near the intersection of Shelton and Poplar Tent Rds.

CONCORD	6/12/2006	Large tree limbs down.
HARRISBURG	7/22/2006	Tree down on Robinson Church Rd and a few large limbs down in the area.
KANNAPOLIS	3/4/2008	Several trees and power lines blown down between Kannapolis and Mount Pleasant.
CONCORD	6/22/2008	Trees were blown down.
ROCKY RIVER	6/22/2008	Trees were blown down near the intersection of Stough Rd and highway 49.
CABARRUS	6/28/2008	Trees blown down on Sam Black Rd.
MT PLEASANT	7/8/2008	Numerous trees were blown down in the Mount Pleasant area, with damage being most concentrated in the Mount Olive Rd area.
CONCORD	7/8/2008	A tree was blown down on a house off Virginia St in Concord, which caused significant damage to the roof. Another tree was blown down on Hillindale St.
MT PLEASANT	7/22/2008	Two trees were blown down.
JACKSON PARK	4/5/2011	Multiple trees were blown down from west of Concord, through the city, and across the Mount Pleasant area. One tree fell on a home west of Concord.
NORTH CONCORD	4/28/2011	Two large pine trees were blown down on Southcircle Dr. Another tree was blown onto a home on Kannapolis Highway about 3.5 miles northwest of Concord.
CONCORD	6/11/2011	A few trees were blown down around Concord.
KANNAPOLIS	6/18/2011	Large tree limbs were blown down in the Kannapolis area.
MT PLEASANT	6/18/2011	Public reported large tree limbs blown down in the Mount Pleasant area.
JACKSON PARK	6/21/2011	Multiple trees were blown down on the west side and east side of Concord.
ROBERTA MILLS	8/11/2011	Six aircraft were damaged and at least one tree blown down at Concord Regional Airport. Large tree limbs were also blown down near Concord Mills.
ROBERTA MILLS	9/2/2011	Part of the roof was blown off a warehouse on Lyles Lane. Witnesses in the area reported extreme winds and a small rotary wind that may have been a “gustnado.”
CONCORD	9/2/2011	Multiple trees were blown down on the north and west side of Concord. Several power poles were also snapped along highway 29 south of town.
CONCORD	9/27/2011	Part of a roof was blown off a vacant warehouse in Concord and trees were blown down at McGill Ave and Kerr St.
ROBERTA MILLS	10/19/2011	The FAA reported that wind blew a small helicopter onto its side at the Concord Regional Airport.
KANNAPOLIS	6/22/2012	A few trees were blown down in the Kannapolis area with one tree down on power lines on Southeast Ave.
KANNAPOLIS	7/27/2012	Multiple power lines were blown down across Kannapolis, with at least two of those having been brought down by large tree limbs.
BARRIERS MILL	6/18/2015	FD reported two tree and multiple power lines blown down near Mount Pleasant.
HARRISBURG	6/19/2015	FD reported one tree and multiple large limbs blown down, some onto power lines in the Harrisburg area.
ROBERTA MILLS	6/20/2015	Spotter reported multiple trees down west of Concord. Another spotter reported multiple large trees down near Newport Dr and South Main St in Kannapolis. Public reported parts of roofing peeled off the YMCA building in Kannapolis.
HARRISBURG	6/22/2015	Public reported a tree down just south of the Charlotte Motor Speedway, and another tree down in Harrisburg proper, via social media.
WEST CONCORD	6/22/2015	EM reported dozens of trees and some power lines blown down across the city of Concord. Trees or large limbs fell on homes on Burrage Rd, Queens Rd, Brookwood Ave, McKinnon Ave near Church St, Long Ave, and May St. Two vehicles were also destroyed by falling trees on May St.

CONCORD	8/19/2015	County comms reported a few trees blown down in the Concord area when two severe storms moved over the city within a few minutes of each other.
WEST CONCORD	9/4/2015	County comms reported multiple trees blown down southwest of Concord. Media reported some billboards damaged near Charlotte Motor Speedway.
CABARRUS	4/24/2017	Newspaper reported a combination of gusty winds and saturated soils from more than 48 hours of moderate to heavy rain caused a tree to fall on a home on Bethel Church Rd, resulting in significant damage that made the home uninhabitable.
ROBERTA MILLS	6/13/2017	County comms reported a tree blown down on Blackberry Trail and another tree down on Memory Ln.
HARRISBURG	7/5/2017	FD reported a tree blown down on a car on Sherborne Dr.
CONCORD	9/1/2017	Local law enforcement reported several trees and some power lines blown down in Concord.
WEST CONCORD	5/4/2019	County comms reported several trees blown down on Highway 601 near the intersection of Highway 49.
HARRISBURG	5/11/2019	Law enforcement reported numerous trees blown down along with multiple power lines across southern Cabarrus County.
JACKSON PARK	6/20/2019	County comms reported numerous trees blown down in the Concord area.
JACKSON PARK	7/4/2019	Fire dept reported a tree blown down on power lines on Meadowview Ave SW and at Hoover Ave at Reed St.
WEST CONCORD	10/31/2019	County comms reported a couple of trees blown down.
CONCORD	2/6/2020	Spotter reported multiple trees blown down in the area bound by Highway 3, Old Airport Road, and Highway 73.
GLASS	4/13/2020	Media reported multiple trees blown down on the Cabarrus County side of Kannapolis, with some homes damaged due to fallen trees.
KANNAPOLIS	7/17/2020	County comms reported trees blown down off Brantley Rd and China Grove Rd.
ROCKY RIVER	7/18/2020	County comms reported multiple trees blown down off Zion Church Rd.
MT PLEASANT ARPT	7/18/2020	Public reported the roof blown off a barn and multiple trees blown down on Saint Stephens Rd. County comms reported multiple trees blown down south of Gold Hill in Cabarrus County.
ROBERTA MILLS	7/12/2021	County comms reported a tree blown down on a house on Glen Eagles Ln.
GEORGEVILLE	8/11/2021	Public reported multiple trees blown down with a large limb on a house on Club View Dr.
JACKSON PARK	8/11/2021	County comms reported several trees blown down in the Concord area.
GLASS	8/15/2021	Law enforcement reported multiple trees blown down across Kannapolis.
GLASS	6/1/2022	Trees and utility lines were blown down, with one tree on a house near Wilkinson St.
ROBERTA MILLS	6/14/2022	Public reported two trees blown down and blocking Odell School Rd and additional trees and many large limbs down in the Poplar Tent community.
CONCORD	6/16/2022	Public reported numerous trees and power lines blown down across Cabarrus County, especially the central part of the county.
KANNAPOLIS	7/5/2022	County comms reported several trees blown down in Kannapolis and vicinity.
GEORGEVILLE	7/29/2022	County comms reported multiple trees, power lines, and numerous large tree limbs blown down.
MIDLAND	8/10/2022	Public reported trees blown down in the Midland area.
HARRISBURG	1/12/2023	Public reported (via Social Media) a tree blown down in the Harrisburg area and multiple trees down at Miami Church Rd and Mount Pleasant Rd. Spotter

		reported a tree down near the intersection of Zion Church Rd and Flowes Store Rd.
MT GILEAD	6/26/2023	Utility company reported multiple trees or large limbs blown down.
KANNAPOLIS	8/6/2023	Ham radio operator reported a tree blown down on a house on Ashbury Ln.
GLASS	8/7/2023	Emergency manager and public reported multiple trees blown down from northwest Cabarrus County through Concord and Harrisburg. One tree fell through the roof of a home on the northwest side of Concord.
HARRISBURG	8/15/2023	County comms reported trees blown down near Roberta Rd and Physicians Blvd and a tree blown down along Mary Circle.
WEST CONCORD	8/24/2023	County comms and law enforcement reported around 20 trees blown down from the south side of Concord to west of Mount Pleasant.
GLASS	8/26/2023	County comms reported multiple trees and power lines blown down on Shiloh Church Rd.
HARRISBURG	8/27/2023	Utility company reported trees blown down on power lines on Rocky River Rd.
KANNAPOLIS	1/9/2024	Public reported (via Social Media) several trees blown down in Kannapolis. Emergency manager reported numerous trees down in Concord and vicinity.
HARRISBURG	4/11/2024	Emergency manager reported numerous trees and power lines blown down from the Harrisburg area, across Concord and points northeast. One tree fell on a structure on Buckingham Ln in Harrisburg.
ROBERTA MILLS	5/8/2024	Public reported a few trees and power lines blown down near the Charlotte Motor Speedway.
RIMER	7/16/2024	Public reported multiple trees blown down near the Rowan County line, including on Irish Potato Rd. Several homes in the area also reported roof damage from a combination of wind and hail.
KANNAPOLIS	8/2/2024	Spotter reported trees blown down onto houses on Pine St and on West C St in Kannapolis.
Stanly County		
	5/13/1995	Trees down on the Montgomery County line and at the edge of the Pee Dee River south of Morrow Mountain State Park.
BADIN	4/30/1996	Strong thunderstorm winds toppled trees and blew down power lines in the Badin area.
ALBEMARLE	7/15/1996	Trees down.
NRN HALF	7/15/1996	Trees down north of Albemarle.
ALBEMARLE	9/29/1999	The same thunderstorm that spawned a tornado in Locust produced a downburst on the out skirts of Albemarle which damaged three mobile homes.
ALBEMARLE	5/22/2001	Six trees were blown down across Gene, Gurley, and Yadkin Brick Roads.
NEW LONDON	4/17/2006	NUMEROUS TREE DOWN ACROSS NORTHERN PORTIONS OF THE COUNTY.
STANFIELD	6/11/2006	Trees down near Love Mill Road and Talley Road.
NORWOOD	6/23/2006	Power lines down.
ALBEMARLE	8/3/2006	Several reports of trees and power lines down on SR-27.
NEW LONDON	8/30/2006	Trees reported down.
NORWOOD	11/16/2006	Trees down near Norwood.
OAKBORO	3/4/2008	Fifteen to twenty trees were blown down. A trailer was also moved 150 FEET by wind speeds estimated at 65 to 70 mph.
ALBEMARLE	3/4/2008	Several trees were reported blown down across Albemarle.
NORWOOD	3/4/2008	Severe winds estimated at 60 to 70 mph blew off an awning off of a gas station.
ST MARTIN	5/20/2008	Straight line winds downed trees onto St Martin Road northeast of Oakboro.
AQUADALE	7/6/2008	Trees were blown down on Highway 138 between Oakdale and Aquadale.

NORWOOD	7/8/2008	Several trees were blown down in the Norwood area.
RICHFIELD	7/8/2008	Several trees were blown down in the Richfield area.
ALBEMARLE ARPT	7/8/2008	One tree was blown down at the intersection of Aquadale and Morgan Roads.
RICHFIELD	7/22/2008	Several trees were blown down near Highway 52 and Old Salisbury Road.
BADIN	7/31/2008	One tree was blown down at the corner of Henderson Street and Valley Drive.
ST MARTIN	8/7/2008	A severe thunderstorm knocked a tree onto a house just northeast of Oakboro.
STANFIELD	4/5/2011	Several trees were blown down along a swath from just west of Stanfield to near Badin.
NORWOOD	6/11/2011	Large tree limbs were blown down across Quail Trail Road.
LOCUST	6/18/2011	Numerous trees were blown down in Locust.
FINGER	6/18/2011	Several trees were blown down in Finger.
NEW LONDON	7/4/2011	Trees and power-lines were blown down, with one down tree on Highway 52 North.
OAKBORO	7/13/2011	Numerous trees were reported down throughout Stanly County.
ALBEMARLE	7/31/2011	Several trees were blown down along the wind swath, including down trees on Lowder Street and NC Highway 205. One tree was also reported down on a home. There was no information available regarding monetary damages.
PALESTINE	8/6/2011	One tree was blown down on Palestine Road.
ALBEMARLE	9/2/2011	A tree was blown down a few miles north of Albemarle on Snuggs Park Road.
LAMBERT	3/3/2012	Two old barns were blown down and one home on Substation Road sustained minor damage.
LOCUST	3/24/2012	Two trees were blown down in Locust.
HALLS FERRY JCT	5/22/2012	One tree was reported down on Old Salisbury Road.
NEW LONDON	5/22/2012	One tree was reported down on Herlocker Road.
NEW LONDON	7/3/2012	Trees were blown down across North Carolina Highway 740 near New London.
ALBEMARLE	7/6/2012	Several trees were reported down across roads and power lines near Albemarle, with one tree reported to have fallen on a home.
PALMERVILLE	7/9/2012	One tree was blown down on power-lines resulting in scattered power outages in New London and Badin.
PALMERVILLE	7/18/2012	Several trees were blown down on Palmerville Road near Badin.
BIG LICK	7/19/2012	A tree downed several power lines on NC 24/27 near Oakboro. Also, several power outages were reported in Albemarle.
RED CROSS	7/27/2012	A couple of trees were blown down along a swath from near Oakboro to near Badin, with one tree falling on a home near Badin. Monetary damages were unknown.
PALMERVILLE	8/8/2012	One tree was reported down onto a house. No other information was available.
ALBEMARLE ARPT	8/8/2012	Power-lines were reported down.
ALBEMARLE	8/17/2012	A couple of trees were blown down just west of the city of Albemarle.
NORWOOD	6/2/2015	One tree was blown down on Piney Point Road in Norwood.
LOCUST	7/20/2015	A tree and several power lines were blown down on Carol Avenue in Locust.
ALBEMARLE	9/4/2015	Numerous trees were blown down along a swath from Old Salisbury Road in North Albemarle to Lakewood Drive in Oakboro.
STANFIELD	4/6/2017	Numerous trees were blown down along a swath from Stanfield to Badin, several of which were blocking roads.

OAKBORO	5/5/2017	Trees were reported down on both lanes of Griffin Green Boulevard.
ALBEMARLE ARPT	5/5/2017	Numerous trees were reported down in Albemarle, focused near Pee Dee Avenue and East Main Street.
ALBEMARLE	5/5/2017	One tree fell onto a home at New Castle Court. The tree crashed through the roof of the house.
OAKBORO	7/5/2017	A couple of trees were blown down on Old Sandbar Road.
ALBEMARLE	7/18/2017	Multiple trees were reported and power lines were reported down in the Albemarle area.
NEW LONDON	7/28/2017	One tree was blown down near the intersection of NC-740 and Woodhurst Road.
ALBEMARLE	4/19/2019	Several trees blown down in the city of Albemarle.
NORWOOD	4/19/2019	Several trees blown down through-out the city.
RICHFIELD	5/4/2019	One tree was reported down on Willie Road at Fontana Drive and another tree down on Willie Road at Spivey Road.
NEW LONDON	6/20/2019	Numerous trees and power lines were reported down in the New London area.
BLOOMINGTON	8/1/2019	Multiple trees were blown down and a roof was blown off a barn near the intersection of Canton Road and Austin Road.
RED CROSS	1/11/2020	Numerous trees and power lines were reported down across western portions of the county.
BLOOMINGTON	1/11/2020	Numerous trees were reported down across the county.
ALBEMARLE	2/6/2020	The goal post at the Albemarle High School was bent from the damaging winds.
ALBEMARLE	2/6/2020	The roof was reported damaged to a business in the 1400 block of United States Highway 52.
PALESTINE	2/6/2020	Several trees were reported snapped off in the vicinity of Mountain Creek Road and Talbert Drive. The roof to a carport was also blown off.
ALBEMARLE	2/6/2020	Several trees were reported down in Albemarle. Some of the trees fell on outbuildings and vehicles causing minor damage.
NORWOOD	2/6/2020	Numerous trees were reported down in and around Norwood.
BIG LICK	5/22/2020	Multiple trees were reported down on Griffin Green Boulevard.
BADIN	5/22/2020	One tree was reported down on Stand Drive.
STANFIELD	5/28/2020	A tree was reported down on a car at the intersection of Robert Drive and North Carolina Highway 200.
BIG LICK	5/28/2020	Trees and power lines were reported down at Big Lick Road and Oak Grove Road.
OAKBORO	6/11/2020	Multiple trees were reported down in Oakboro.
RED CROSS	6/22/2020	Numerous trees were reported down across Stanley County.
OAKBORO	5/3/2021	Trees were reported down and damage to a roof was reported near Hurley Road to Pecan Drive.
OAKBORO	5/3/2021	Numerous trees were reported down from Sun Rise Lane to Hazard Road.
PORTER	5/6/2022	Extensive tree damage was reported around Lake Tillery, including trees on residences. The intersection of one report was Indian Mound Rd and Shore Farm Rd near Norwood.
PLYLER	5/23/2022	State officials report numerous trees down across Stanly County.
COTTONVILLE	5/27/2022	Many trees were reported down around the intersection of Rocky River Springs Rd and Southern Rd in Norwood.
OAKBORO	6/16/2022	Several trees were reported down in the Oakboro area.
OAKBORO	7/20/2022	Multiple trees were reported down near the intersection of South Main St and Aquadale Rd in Oakboro.

AQUADALE	7/20/2022	A tree fell on power lines, causing power outages near the intersection of Ray Bud Rd and Old Aquadale Rd in Aquadale.
LOCUST	8/10/2022	Trees were reported down near the intersection of Market Street and Ray Kennedy Drive.
NEW LONDON	1/12/2023	Trees were reported down on Church Street.
RICHFIELD	6/19/2023	A tree was reported down, blocking the roadway near the 48800 block of High Rock Rd in Richfield.
ALBEMARLE ARPT	7/1/2023	Trees were reported down and roof damage in Albemarle.
ALBEMARLE	8/7/2023	Trees were down all over Stanly County, including one that fell on an apartment building in Albemarle.
RICHFIELD	9/7/2023	One tree was reported down in the Richfield area near the intersection of Moss St and N Main St.
COTTONVILLE	1/9/2024	Trees and powerlines were reported down near the intersection of Whitley Rd and Mt Zion Church Rd.
ALBEMARLE ARPT	1/9/2024	Several trees were reported down in the town of Albemarle.
ST MARTIN	5/8/2024	Widespread trees and powerlines were reported down from the towns of Locust to Albemarle.
NORWOOD	5/15/2024	A tree was reported down, resulting in power lines down near the intersection of Fork Rd and highway 731.
NEW LONDON	8/18/2024	Numerous trees were reported down in the town of New London.
Union County		
Weddington	4/24/1995	Trees down on home on Route 16.
Waxhaw	8/15/1995	Trees down near Waxhaw in SW Union County.
MARSHVILLE	4/20/1996	Severe thunderstorms developed in the western North Carolina mountains and moved east. Trees and power lines were blown down at several locations from Swain County to Union County. Around Maggie Valley and Lake Junaluska a porch was blown off a house and landed on a car. Power was out to about 5700 people in that area. Another area of damage was near the Blue Ridge Parkway where trees and signs were blown down. Around Cashiers a number of trees were downed causing damage to homes and a pickup truck was blown off an embankment. Also shingles were blown off houses and roofs were blown off of some utility buildings. Near Brevard there was a damage swath about 200 yards wide and 3/4 mile long where a mobile home was blown off its foundation. Nine other mobile homes and two houses were damaged by the wind. In Gaston county shingles were blown off homes in a couple of locations, large trees were downed by the wind and a trampoline was blown into power lines. A damaging storm traversed Union county, blowing over a mobile home, destroying a barn and downing a number of large trees. Trees and power lines were downed near Charlotte.
MONROE	4/30/1996	
MONROE	5/29/1996	
MONROE	7/30/1996	A severe thunderstorm blew down trees and power lines from Monroe to the east of town. There were numerous cloud to ground lightning strikes. A restaurant was reported to have burned from one of the strikes.
MARSHVILLE	8/26/1996	A downburst ripped part of the roof off a well-constructed barn causing significant damage. Some swirls in nearby grass suggested a tornado possibly caused the damage but evidence is insufficient and no witnesses observed the storm.

MONROE	1/3/1999	A fast moving low-topped thunderstorm moved through Union county North Carolina along a boundary separating remnants of an arctic airmass and warm moist air from the Atlantic Ocean. The storm became severe, producing a southwest to northeast path of damage across central Union county. Trees were downed and there was damage to a home and picnic table.
WEDDINGTON	3/21/1999	A severe thunderstorm generated damaging winds that blew down fences and injured horses that were loosed from their pasture.
WINGATE	5/13/1999	Scattered thunderstorms developed during the afternoon and evening of the 13th and a few pulsed to severe levels. In Henderson county, golf ball size hail covered Highway 280 and a large tree fell onto a house in Hendersonville, causing significant damage to the house and outdoor furniture. Dime to golf ball size hail was reported in Union county along with a measured wind gust to 85 mph. Quarter size hail was reported late in the evening in Avery county. There was a public report of a sighting of a very weak tornado that appeared to make a brief touchdown, but caused no damage, north of Marion. Due to insufficient data in support of this report, an official tornado event will not be entered.
WAXHAW	6/10/1999	Scattered thunderstorms developed in the mountains during the early afternoon. A couple of those storms became severe and downed trees and power lines. A cluster of severe thunderstorms developed in the southern piedmont during the evening and produced damaging straight-line winds which downed trees in many locations. A small mobile home was blown over southwest of Lincolnton. More than one inch of rain fell in a short period of time in Charlotte and caused some urban flooding in which a few cars were involved. However, no serious problems were reported.
WEDDINGTON	7/6/1999	One thunderstorm early in the afternoon became severe and an automated gage at Panthertown measured a wind gust to 58 mph. Downed trees in Weddington caused some property damage, but a dollar amount was not known at the time of the writing.
MONROE	7/24/1999	Clusters of slow-moving thunderstorms developed during the afternoon on another hot and humid summer day. Some of the storms became severe, producing large hail the size of nickels and quarters, and straight-line winds which downed numerous trees. In Kannapolis, the roof of a commercial building was blown off. In rural areas around Monroe, small streams briefly came out of their banks and flooded typical flood-prone areas.
MONROE	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
MONROE	8/1/1999	Clusters of severe thunderstorms rumbled through the southern piedmont of North Carolina during the late afternoon and evening hours. Straight-line winds produced by these storms downed many trees and some power lines. One house in Mt. Ulla was damaged by a downed tree. A citizen near Pineville reported twin gustnadoes separated by 30 seconds, which spun up along the gust front of one of the severe thunderstorms. The wind from the gustnadoes pinned the man against the outside wall of his home, chewed up tree limbs and downed a few trees, and threw a 40-foot section of a tree over his house. A neighbor measured the wind associated with the first gustnado at 70 mph

		with a hand held anemometer. Large hail and straight-line winds broke windows in Marshville.
WAXHAW	8/1/1999	Clusters of severe thunderstorms rumbled through the southern piedmont of North Carolina during the late afternoon and evening hours. Straight-line winds produced by these storms downed many trees and some power lines. One house in Mt. Ulla was damaged by a downed tree. A citizen near Pineville reported twin gustnadoes separated by 30 seconds, which spun up along the gust front of one of the severe thunderstorms. The wind from the gustnadoes pinned the man against the outside wall of his home, chewed up tree limbs and downed a few trees, and threw a 40-foot section of a tree over his house. A neighbor measured the wind associated with the first gustnado at 70 mph with a hand held anemometer. Large hail and straight-line winds broke windows in Marshville.
MARSHVILLE	8/1/1999	Clusters of severe thunderstorms rumbled through the southern piedmont of North Carolina during the late afternoon and evening hours. Straight-line winds produced by these storms downed many trees and some power lines. One house in Mt. Ulla was damaged by a downed tree. A citizen near Pineville reported twin gustnadoes separated by 30 seconds, which spun up along the gust front of one of the severe thunderstorms. The wind from the gustnadoes pinned the man against the outside wall of his home, chewed up tree limbs and downed a few trees, and threw a 40-foot section of a tree over his house. A neighbor measured the wind associated with the first gustnado at 70 mph with a hand held anemometer. Large hail and straight-line winds broke windows in Marshville.
MONROE	8/14/1999	Isolated severe thunderstorms brought damaging wind and large hail to a few locations in the northwest and southern piedmont of North Carolina. Just north of Conover, it hailed for 15 minutes, with the largest hail falling near the end and badly denting a car. Ten trees were blown down in southeast Union county. Trees were also blown down in Rowan county including 2 large trees which fell on a mobile home in the town of Cleveland.
INDIAN TRAIL	4/1/2001	911 center reported trees down and wind estimated to 65 mph. A storm spotter nearby recorded an actual measured gust of 60 mph.
MONROE	4/1/2001	911 center reported trees down.
MONROE	4/1/2001	
MARSHVILLE	4/1/2001	911 center reported trees down and wind estimated at 65 mph.
INDIAN TRAIL	5/19/2001	Sheriff's department measured a 52-knot wind gust during a severe thunderstorm. Minutes later, large hail was reported. There were also power outages.
STALLINGS	5/19/2001	Emergency management reported trees down.
WINGATE	5/19/2001	Emergency operations center reported six trees down between Wingate and Marshville.
INDIAN TRAIL	5/22/2001	Sheriff's department reported three large trees down, with large limbs landing on roofs.
WINGATE	6/22/2001	A very strong microburst completely tore the roof off one duplex and damaged five others. Numerous trees and power lines also brought down.
MONROE	8/9/2001	Two trees were snapped off by marginally-severe thunderstorm winds.
MONROE	4/17/2006	Quite a few trees down.
MARSHVILLE	4/22/2006	Power lines down between Marshville and New Salem. A tree and large limbs also down on Medlin-Roberts Rd, with roof damage to several barns and sheds in the area.
WINGATE	4/22/2006	A couple trees blown down.

FAIRVIEW	5/26/2006	Three large oak trees blown down, one on a house.
NEW SALEM	5/26/2006	A couple trees blown down.
FAIRVIEW	6/11/2006	Trees down on Unionville Brief Rd.
MONROE	6/12/2006	Numerous trees and power lines down in the area around the intersection of Potter and Newton Rds.
MONROE	8/4/2006	Trees down on highway 205 near Olive Branch Rd.
WAXHAW	8/4/2006	Trees blown down just south of Waxhaw near highway 75 and power lines blown down in Waxhaw.
MONROE	8/9/2006	Several trees down between highway 601 and Morgan Mill Rd and another tree down along Lawyers Rd.
MARSHVILLE	11/16/2006	Six trees blown down along highway 205, with additional trees down on Olive Branch Rd.
ALTON	4/4/2008	A tree was blown down on McManus Rd.
WAXHAW	4/4/2008	A tree was blown down on Parkwood School Rd.
MONROE	5/20/2008	Numerous trees were blown down across much of the county.
WAXHAW	6/11/2008	A tree was blown down and the roof blown off a barn on S Potters Rd.
WAXHAW	6/11/2008	Trees blown down.
STALLINGS	6/27/2008	A large tree and several large limbs were blown down across Stallings.
MONROE	7/8/2008	Numerous trees and power lines were blown down across the county.
MARVIN	7/23/2008	Large tree limbs were blown down.
STOUTS	7/23/2008	Numerous trees were uprooted, two large storage containers blown around, and garage doors blown in on Stinson Hartis Rd.
UNIONVILLE	2/28/2011	Several trees were blown down a little way south of Fairview.
WEDDINGTON	4/5/2011	Numerous trees were blown down across Union County, with several roads closed around Monroe due to downed trees.
WAXHAW ARPT	5/11/2011	Numerous trees were blown down to the south of Waxhaw, toward the state line.
ALTON	5/11/2011	Multiple trees were blown down along highway 207, near the state line.
ALLEN XRDS	6/10/2011	Several trees were blown down in the Allens Crossroads area, with one tree down on a fire truck.
WAXHAW	6/18/2011	Numerous trees and power lines were blown down across the county.
INDIAN TRAIL ARPT	7/13/2011	Several large tree limbs were blown down at Lawyers Rd and Stevens Mill Rd, near the Mecklenburg County line.
HAMILTONS XRDS	7/25/2011	A tree was blown down near highway 205 and Ansonville Rd.
ALLEN XRDS	7/25/2011	A tree was blown down on Camden Rd about 4.5 miles south of Marshville.
MONROE	8/8/2011	Numerous trees were blown down from just east of the Monroe city limits toward Marshville.
STALLINGS	8/11/2011	A few trees were blown down in the Water Oak area.
MONROE	8/11/2011	A tree was blown down onto a house on Johnson St in Monroe.
MINERAL SPG	8/11/2011	Trees were blown down on Pleasant Grove Rd.
INDIAN TRAIL	8/21/2011	Several trees and power lines were blown down.
HAMILTONS XRDS	8/21/2011	A tree was blown down on Ansonville Rd.
NEW SALEM	8/21/2011	A tree was blown down on highway 205 near New Salem.
MARSHVILLE	3/24/2012	Two large trees were blown down at Olive Branch Rd and Old Gold Mine Rd.
HOUSTON	4/3/2012	Multiple trees were blown down along Waxhaw Highway, especially near the intersection of South Rocky River Rd.
WESLEY CHAPEL	6/24/2012	Trees were blown down on power lines on Antioch Church Rd.

FAIRVIEW	7/1/2012	Trees were blown down near Fairview and in Unionville. More than two dozen trees were felled on the Wingate University campus, with the roofs of several buildings and some automobiles damaged by the fallen trees. Another tree fell on a convenience store in Wingate.
WINGATE	7/1/2012	Multiple trees were blown down near the intersection of Macedonia Church Rd and highway 601.
MINERAL SPG	7/3/2012	A tree was blown down on Nesbit Rd and another tree down on Plyler Mill Rd several miles southwest of Monroe.
MONROE	7/5/2012	Multiple trees and power lines were blown down on Franklin St and Bragg St in the city with large limbs down at Medlin Rd and Macedonia Church Rd. Other large limbs were blown down on Wolf Pond Rd near Joe Collins Rd and four trees blown down on Bruce Thomas Rd near Stack Rd. Trees fell on seven homes, with four of the homes incurring major damage.
MONROE	7/9/2012	Several trees were blown down from Monroe to Wingate.
HAMILTONS XRDS	7/9/2012	Several power lines were blown down on Ansonville Rd.
WEDDINGTON	7/10/2012	Multiple trees and large limbs were blown down in the Blakeney area.
MONROE	7/16/2012	A few trees were blown down along Wolf Pond Rd, including one tree that fell on a vehicle south of the Marvin Watkins Rd intersection.
WAXHAW	7/24/2012	Multiple trees were blown down around the Waxhaw area.
WEDDINGTON	7/27/2012	Multiple trees and power lines were blown down from near Waxhaw to near Monroe.
FAIRFIELD	8/2/2012	Multiple trees were blown down along New Salem Rd from the Tarton Mill Rd intersection to the highway 200 intersection.
MINERAL SPG	8/6/2015	County comms reported multiple trees blown down between Waxhaw and Monroe.
NEW SALEM	9/4/2015	County comms reported multiple trees blown down along Highway 218 east of Fairview.
STURDIVANTS	4/3/2017	Shingles were blown off an outbuilding on Gulledge Rd and a carport was blown across a road. A couple of trees were also blown down.
MARSHVILLE	7/5/2017	County comms reported multiple trees and power lines blown down in the Marshville area.
UNIONVILLE	7/15/2017	Public reported numerous trees blown down, several houses with roof damage and multiple chicken houses heavily damaged or destroyed in and around Unionville.
STOUTS	7/28/2017	Law enforcement reported trees blown down on Flagstone Ln.
WAXHAW	10/23/2017	County comms reported multiple trees and power lines blown down in the Waxhaw area.
BAKERS	4/19/2019	Public reported trees blown down, a collapsed shed and damage to a silo north of Union.
BAKERS	6/22/2019	County comms reported multiple trees blown down off Highway 601 just north of Monroe.
UNIONVILLE	4/13/2020	Public reported (via Social Media) trees blown down on Unionville Brief Rd.
WAXHAW ARPT	5/22/2020	Amateur radio reported trees blown down and blocking Providence Road South.
INDIAN TRAIL ARPT	5/29/2020	Public reported via Social Media a few trees blown down in the vicinity of Highway 218.
FAIRFIELD	7/18/2020	County comms reported at least two trees blown down, with one blocking New Salem Rd.
STOUTS	7/18/2020	Public reported (via Social Media) trees blown down on Painted Horse Dr and large limbs down on Secreat Short Cut Rd.

UNIONVILLE	8/31/2020	Fire dept reported trees blown down near the intersection of Unionville Rd and Sikes Mill Rd.
WAXHAW	8/14/2021	Public reported trees blown down near Cuthbertson Rd and Providence Rd South.
NEW SALEM	3/31/2022	Public reported multiple trees blown down at Highway 205 and Highway 218.
WAXHAW	5/6/2022	County comms reported numerous trees blown down between Waxhaw and Monroe.
ALTON	5/23/2022	Media reported trees blown down and minor damage to a house.
WAXHAW ARPT	6/3/2022	Public reported multiple utility poles down on Dapple Ridge Rd.
MONROE	6/16/2022	Emergency manager reported trees blown down throughout Union County.
SHALETON	7/6/2022	Public reported trees blown down off Spring Meadow Ln.
WESLEY CHAPEL	7/7/2022	Emergency manager reported multiple trees and large limbs blown down near the intersection of New Town Rd and Potter Rd South.
STOUTS	7/9/2022	County comms reported a tree blown down and blocking roadway on Indian Trail Fairview Rd at 1st Ave in Indian Trail. Another tree was down on Boyte Rd at Valley St.
STALLINGS	7/23/2023	Utility company reported trees and limbs blown down on power lines.
UNIONVILLE	7/30/2023	Spotter reported multiple trees and some power lines blown down.
WAXHAW	8/7/2023	County comms reported numerous trees blown down across the county, with two trees down on houses in Monroe, one on a vehicle in Marshville, and others down on power lines.
FAIRVIEW	5/8/2024	Utility company reported trees blown down on power lines.
MONROE	5/8/2024	Public reported several trees blown down in the Monroe area.
WAXHAW ARPT	5/8/2024	Public reported a couple of trees blown down in southern Union County.
WESLEY CHAPEL	6/30/2024	Utility company reported several trees and power lines blown down in the Wesley Chapel area. Public also reported trees down near Weddington.
HOUSTON	7/6/2024	Utility company reported trees and large limbs blown down on power lines southwest of Monroe.

TABLE H.14: WINTER STORM EVENTS (1996-2024)

Date	Description
Cabarrus County	
1/6/1996	Rain gradually changed to freezing rain and then snow and sleet across the southern Piedmont. The precipitation continued well into the next day. The layer of ice under the 1 to 2 inches of snow caused serious traffic problems. All across western and central North Carolina, numerous traffic accidents and sledding accidents were reported. There were numerous indirect injuries and a few fatalities associated with the storm. Most injuries and deaths were traffic related. In Alexander, a man was crushed when an outbuilding collapsed from the weight of the snow.
1/11/1996	The second snowstorm within a week caused more excitement in North Carolina. Up to a foot of snow was reported in some of the mountains with most mountain and foothill locations receiving 3 to 6 inches. In the piedmont, there was more of a mixture of ice with minimal ice storm conditions reported in and around the Charlotte area. There were some power outages and numerous traffic accidents.
2/3/1996	Light snow accumulated to 1 to 3 inches on top of the ice. Travel problems worsened in some places.
2/16/1996	Snow fell and accumulated to several inches with heavier amounts in the northern mountains.
2/19/1999	A surface low moving across central Georgia and South Carolina combined with a strong upper level system to produce light snow across much of western North Carolina during the afternoon. Most accumulations were between 1 and 2 inches. Although there was a band of 3-inch accumulations stretching from the northern mountains, southeast through Morganton and to Shelby. Also, some isolated accumulations of around 8 inches were reported from the very highest peaks in the northern mountains.
1/16/2008	Light snow developed across the Piedmont during mid-evening, and continued through much of the overnight hours. By mid-morning on the 17th, total accumulations ranged from around an inch south of I-85, to 3 inches or so along the I-40 corridor. Sleet and freezing rain mixed in with the snow before the event ended.
1/22/2008	Freezing drizzle and light freezing rain developed across the western Piedmont around sunrise. Roads became very slick and hazardous, and there were numerous traffic accidents during the morning commute.
2/16/2015	A mix of sleet, snow, and freezing rain overspread the I-77 corridor in Charlotte metro and surrounding areas during late afternoon. Sleet became the primary precipitation type during the evening, before precipitation transitioned to freezing rain south of the I-85 corridor by late evening. Deteriorating road conditions were reported throughout the evening. By midnight, heavy accumulations of sleet and/or freezing rain were reported. Most areas saw around a half inch to an inch of sleet, along with around a tenth of an inch of ice accretion. However, areas south of I-85 saw more in the way of freezing rain, with up to a quarter inch of ice accretion reported in addition to light sleet accumulations. Scattered power outages were therefore more concentrated there. Roads became very treacherous and impassable in many areas until melting began on the afternoon of the 17th.
2/23/2015	Light snow associated with a wave of low pressure overspread the foothills and Piedmont of the Carolinas by late evening of the 23rd, and continued through the overnight before tapering off during the morning of the 24th. Accumulations ranged from a dusting to 2 inches, with the highest amounts generally occurring closer to the mountains. Temperatures right around freezing and warm roads resulted in minimal travel issues.
2/25/2015	After the light snow that fell across portions of the Piedmont on the morning of the 24th, an area of low pressure moving along the Gulf Coast spread yet another round of snow across the North Carolina Piedmont during the evening. Heavy snowfall accumulations were reported in many areas north of the I-85 corridor by midnight. Due to occasional transitions to rain undercutting snowfall rates, total accumulations were generally in the 2 to 4 inch range, although localized

	amounts as high as 7 inches were reported across the northwest Piedmont. The snow tapered off before sunrise.
1/6/2017	As an area of surface low pressure moved northeast along the Gulf and Southeast coasts, moisture overspread the North Carolina Piedmont throughout the 6th. As cold air gradually spilled in from the north, precipitation slowly transitioned from rain to sleet and snow. By daybreak on the 7th, locations across far northern Gaston, Mecklenburg, and Cabarrus Counties had received as much as 5 inches of snow, while locations near the South Carolina border were just beginning to transition to sleet. By the time the precipitation had tapered off to flurries during late morning, mostly snow had fallen near the Iredell, Rowan, and Lincoln County lines, and total accumulations there ranged from 4 to 6 inches. Meanwhile, locations from Gastonia, through Uptown Charlotte to Concord saw quite a bit of sleet, with total accumulations of sleet and snow ranging from 1 to 3 inches. Locations closer to the South Carolina border saw primarily sleet and rain, with some sleet accumulations as high as one half inch.
2/5/2017	Very light freezing precipitation developed briefly across portions of the Piedmont during the pre-dawn hours. This caused some patchy areas of a light glaze that resulted in a few accidents.
3/12/2017	An upper level disturbance interacting with an unseasonably cold air mass resulted in an area of snow that moved quickly across much of the western Piedmont and foothills of North Carolina during the morning of the 12th. Precipitation began as rain in some areas, but quickly changed to snow. Most locations saw total snowfall accumulation from a dusting to less than two inches. However, some locations across the southern Piedmont saw up to 3 inches.
1/23/2019	Patchy light freezing rain developed across western North Carolina during the early morning hours of the 23rd and continued off and on through mid-morning. Ice accretion was generally confined to areas north of I-85, and was quite light in most areas, around a tenth of an inch or less. Some slick spots developed on roads, resulting in a few traffic accidents.
4/2/2019	Moisture associated with an area of low pressure developing off the southeast coast overspread an unseasonably cool air mass over the Piedmont during the morning hours. Precipitation initially fell as a mix of rain and snow. However, pockets of snow developed in association with heavier precipitation rates. This resulted in some areas of accumulation in the 0.5 to 1-inch range, mainly in areas south and east of the city of Charlotte. However, up to 2 inches fell across portions of Union County. Despite warm pavement, snowfall rates were such that snow accumulated on some roadways, resulting in slick spots.
1/16/2022	Moisture overspread the North Carolina Piedmont early on the 16th as strengthening low pressure moved across the Deep South. Strong northeast winds supplied ample cold air for the precipitation to begin as light snow across much of the area, resulting in light snow accumulations of up to a couple of inches during the pre-dawn hours. Slight warming of the air aloft resulted in snow changing to sleet across much of this area by sunrise. By late morning, total snow and sleet accumulations of 2 to 5 inches were reported, with locations north of I-40 seeing more snow than sleet, and locations south of I-85 seeing more sleet. Further warming aloft resulted in precipitation briefly changing to freezing rain before tapering off by early afternoon, with light ice accretion reported on top of the sleet and snow. However, scattered snow showers redeveloped during the afternoon and evening, producing spotty additional light accumulations.
Stanly County	
1/17/2008	Between one to two inches of snow accumulated countywide mostly before daybreak.
1/19/2008	Around one-half inch of snow accumulated during the afternoon and early evening hours.
1/10/2011	Six inches of snow fell across the area during the morning and afternoon hours. Snow changed over to freezing rain during the afternoon resulting in nearly an eighth inch of ice on top of the snow. All area roads were covered in snow resulting in the closure of schools and businesses.
2/16/2015	Snowfall amounts of a half of an inch to an inch fell across the county. In addition, around a tenth of an inch of freezing rain accrual was reported.
2/24/2015	Snowfall amounts of a trace to 1 inch fell across the county.

2/25/2015	Snowfall/sleet amounts of 2 to 3 inches fell across the county.
1/7/2017	Snowfall amounts ranged from a dusting across southern portions of the county to near 1 inch across the north.
1/16/2022	Snow and sleet amounts ranged from one to two inches across the county, with up to a quarter of an inch of freezing rain.
Union County	
1/6/1996	Rain gradually changed to freezing rain and then snow and sleet across the southern Piedmont. The precipitation continued well into the next day. The layer of ice under the 1 to 2 inches of snow caused serious traffic problems. All across western and central North Carolina, numerous traffic accidents and sledding accidents were reported. There were numerous indirect injuries and a few fatalities associated with the storm. Most injuries and deaths were traffic related. In Alexander, a man was crushed when an outbuilding collapsed from the weight of the snow.
1/11/1996	The second snowstorm within a week caused more excitement in North Carolina. Up to a foot of snow was reported in some of the mountains with most mountain and foothill locations receiving 3 to 6 inches. In the piedmont, there was more of a mixture of ice with minimal ice storm conditions reported in and around the Charlotte area. There were some power outages and numerous traffic accidents.
1/16/2008	Light snow developed across the Piedmont during mid-evening, and continued through much of the overnight hours. By mid-morning on the 17th, total accumulations ranged from around an inch south of I-85, to 3 inches or so along the I-40 corridor. Sleet and freezing rain mixed in with the snow before the event ended.
1/22/2008	Freezing drizzle and light freezing rain developed across the western Piedmont around sunrise. Roads became very slick and hazardous, and there were numerous traffic accidents during the morning commute.
2/16/2015	A mix of sleet, snow, and freezing rain overspread the I-77 corridor in Charlotte metro and surrounding areas during late afternoon. Sleet became the primary precipitation type during the evening, before precipitation transitioned to freezing rain south of the I-85 corridor by late evening. Deteriorating road conditions were reported throughout the evening. By midnight, heavy accumulations of sleet and/or freezing rain were reported. Most areas saw around a half inch to an inch of sleet, along with around a tenth of an inch of ice accretion. However, areas south of I-85 saw more in the way of freezing rain, with up to a quarter inch of ice accretion reported in addition to light sleet accumulations. Scattered power outages were therefore more concentrated there. Roads became very treacherous and impassable in many areas until melting began on the afternoon of the 17th.
1/7/2017	As an area of surface low pressure moved northeast along the Gulf and Southeast coasts, moisture overspread the Piedmont throughout the 6th. Most of the precipitation fell as rain south of the I-85 corridor. However, as cold air gradually spilled in from the north, a transition to mainly sleet with some pockets of freezing rain occurred. By mid-morning on the 7th, locations closer to the I-85 corridor had up to a half inch of mainly sleet, while some locations saw a light glaze of ice, mainly on elevated surfaces.
3/12/2017	An upper level disturbance interacting with an unseasonably cold air mass resulted in an area of snow that moved quickly across much of the western Piedmont and foothills of North Carolina during the morning of the 12th. Precipitation began as rain in some areas, but quickly changed to snow. Most locations saw total snowfall accumulation from a dusting to less than two inches. However, some locations across the southern Piedmont saw up to 3 inches.
4/2/2019	Moisture associated with an area of low pressure developing off the southeast coast overspread an unseasonably cool air mass over the Piedmont during the morning hours. Precipitation initially fell as a mix of rain and snow. However, pockets of snow developed in association with heavier precipitation rates. This resulted in some areas of accumulation in the 0.5 to 1-inch range, mainly in areas south and east of the city of Charlotte. However, up to 2 inches fell across portions of

	Union County. Despite warm pavement, snowfall rates were such that snow accumulated on some roadways, resulting in slick spots.

Source: NOAA, NCEI

Appendix H:
NCEI Storm Event Data

This section of the Plan includes the historic storm event data as reported to the National Centers for Environmental Information as of 2024.

- H.1 – Cold/Wind Chill
- H.2 – Drought
- H.3 – Extreme Heat
- H.4 – Flood
- H.5 – Hail
- H.6 – Heavy Rain
- H.7 – Heavy Snow
- H.8 – High Wind
- H.9 – Ice Storm
- H.10 – Lightning
- H.11 – Sleet
- H.12 – Tornado
- H.13 – Thunderstorm
- H.14 – Winter Storm

TABLE H.1: COLD/WIND CHILL EVENT DESCRIPTIONS

Location	Date	Description
STANLY	2/3/1996	-
CABARRUS	4/1/1997	Several cold snaps following the relatively warm late winter caused temperatures to dip well into the 20s at times yielding substantial damage to the apple crop and perhaps other crops.
UNION	4/1/1997	Several cold snaps following the relatively warm late winter caused temperatures to dip well into the 20s at times yielding substantial damage to the apple crop and perhaps other crops.
CABARRUS	1/6/2014	An arctic cold front blasted through the western Carolinas during the morning of the 6th, bringing gusty winds and the coldest air mass to have affected the region since 1994. By early evening, winds of 10 to 20 mph, with stronger gusts combined with temperatures falling into the 20s and teens to produce wind chill values below 0 across the Piedmont and foothills. Although wind gradually diminished overnight, low temperatures fell into the single digits across the Piedmont and foothills. The low temperature of 6 at the Charlotte/Douglass International Airport shattered the previous daily record of 12 that had stood for more than a century.
UNION	1/6/2014	An arctic cold front blasted through the western Carolinas during the morning of the 6th, bringing gusty winds and the coldest air mass to have affected the region since 1994. By early evening, winds of 10 to 20 mph, with stronger gusts combined with temperatures falling into the 20s and teens to produce wind chill values below 0 across the Piedmont and foothills. Although wind gradually diminished overnight, low temperatures fell into the single digits across the Piedmont and foothills. The low temperature of 6 at the Charlotte/Douglass International Airport shattered the previous daily record of 12 that had stood for more than a century.
CABARRUS	1/7/2015	A strong arctic cold front moved through the western Carolinas during the morning and afternoon of the 7th, bringing gusty winds and very cold air to the Piedmont and foothills. By late evening, sustained winds of 5 to 15 mph combined with air temperatures in the teens to yield wind chill values near 0. Although winds gradually diminished overnight, air temperatures fell to around 10 degrees in many areas by daybreak, and wind chills of 0 to 5 above lingered until temperatures began warming during late morning. However, temperatures remained at or below freezing in many areas throughout the 8th. Record daily lows were set in the Charlotte area on the morning of the 8th.
CABARRUS	3/16/2017	The 2017 growing season began early across western North Carolina, due to an unusually warm February and early March that saw average temperatures of almost 10 degrees above normal. An episode of cold arctic high pressure in the middle of March led to a hard freeze on the morning of the 16th, when low temperatures in the lower to mid 20s were reported. This caused significant damage to berry, wheat, apple, and peach crops. While subsequent days of freezing temperatures caused further damage, the vast majority of the damage occurred on the 16th.
UNION	3/16/2017	The 2017 growing season began early across western North Carolina, due to an unusually warm February and early March that saw average temperatures of almost 10 degrees above normal. An episode of cold arctic high pressure in the middle of March led to a hard freeze on the morning of the 16th, when low temperatures in the lower to mid 20s were reported. This caused significant damage to berry, wheat, apple, and peach crops. While subsequent days of freezing temperatures caused further damage, the vast majority of the damage occurred on the 16th.
CABARRUS	12/23/2022	An arctic cold front swept across the foothills and Piedmont of western North Carolina during the morning of the 23rd and introduced the coldest air mass in more than 5 years. Temperatures in the single digits and lower teens combined with 10 to 20 mph

		winds to produce wind chill values in the 0 to -15 range from the evening of the 23rd through Christmas Eve morning. While winds abated throughout Christmas Eve into Christmas Day, unseasonably cold weather persisted for the better part of four days. There were numerous reports of frozen and burst pipes along with mostly minor damage to infrastructure throughout the area.

TABLE H.2: DROUGHT EVENT DESCRIPTIONS

Location	Description
7/1/1998	Dry weather continued through much of the month of July, affecting crops during the critical part of the growing season. Corn and other vegetables sustained the most damage, but a dollar amount was not available at the time of this writing.
10/1/1998	The drought which began during the summer continued through October. The only significant rainfall during the month occurred on the 7-8th. Cities and counties began to restrict water usage and streamflows for several mountain locations were reduced to the lowest seen in 50 years.
11/1/1998	Dry weather persisted into the late fall with rainfall deficits between 5 and 10 inches. This affected late season crops and caused water shortages. Water usage restrictions were initiated in many communities.
7/1/1999	A long-term dry spell became a drought in July. Without any widespread rain events, the only relief came in the form of widely scattered afternoon and evening thunderstorms. But even those were few and far between. The lack of rainfall lowered water tables significantly and significant damage to crops began to occur. The North Carolina northern foothills and northwest piedmont were affected first, followed by the southern foothills and southern piedmont. Dollar amounts of the damage were unavailable at the time of this writing.
8/1/1999	The drought worsened during the month of August as high evaporation rates and little rainfall occurred. The most severe conditions by the end of the month had developed in the foothills and piedmont. Water restrictions began in several communities, and for some, the first time in memory. Hay and late crops dried up in many counties. Ponds and wells began to dry up as well, affecting homeowners, farmers, and businesses such as nurseries. In addition, boaters were running aground on recreational lakes due to low water levels.
9/1/1999	Rainfall continued to be scarce across much of western North Carolina through the month of September, prolonging the drought conditions which existed all summer. However, some areas in the piedmont picked up some rain from the remnants of Hurricane Dennis early in the month and from Hurricane Floyd itself two weeks later. Although this rain brought some relief, more wells ran dry and many more areas began mandatory water restrictions.
10/1/1999	The return of some rainfall as well as lower evaporation rates due to the change of seasons, resulted in the drought easing somewhat. Drought classifications were lowered in some cases, and some places lifted water restrictions. However, the drought had not ended by the end of the month.
8/1/2000	The 2-year drought was reaching a critical stage by late summer. Many 80 to 100-foot wells were going dry. Area lakes were at record low levels causing property damage to docks, boats, etc.
9/1/2000	Overall, drought conditions continued across western North Carolina despite some locations receiving near their month's average rainfall. Low stream flow and municipal water supply remained the largest issues with many towns and cities enacting water restrictions. Citizens were quoted as saying this is the driest, they have ever seen it. Despite the drought conditions, impact on crops seemed to be minimal.
10/1/2000	Effects of the drought intensified as many areas received absolutely no rain during the month, setting records for the longest stretch without measurable rainfall in several locations. Wells and mountain streams continued to dry up and lake levels continued to drop. Many communities were forced to start more stringent water conservation measures.

Location	Description
11/1/2000	The long-term drought continued to affect the region. Rainfall during the month was near or slightly above normal, but this had little effect on the ground water levels. Numerous wells dried up during the fall, and well borers and drillers could not keep up with the demand. Large lakes reported record low levels and some communities continued or initiated water control measures.
2/1/2001	The long-term drought's impact became more severe, even during the winter, as water levels in lakes dropped and stream flow on rivers reached the lowest in memory. More and more communities began water restrictions and started preparing for a busy fire weather season.
3/1/2001	Despite beneficial rain during March, the drought continued to grip most of the area. Severe water restrictions were implemented in parts of the North Carolina piedmont, where reservoir had dropped to all-time low levels. In Concord, food establishments were asked to use paper and plastic products to conserve water.
4/1/2001	Some relief to the long-term drought occurred at mid-month, but for the most part, the rainfall deficit for the three-year period actually grew larger by the end of April. Mandatory water restrictions continued at a few mountain locations, with voluntary water restrictions urged at many others. Numerous wells went dry during April.
5/1/2001	Unprecedented drought conditions continued. Some rivers and lakes reached record-low levels. Well-drilling companies in the North Carolina piedmont were recording twice as much business as usual.
8/1/2001	The effects of the long-term drought became more severe, especially in the North Carolina piedmont. Critical water conditions were beginning to concern officials and residents of Charlotte.
12/1/2001	Very little active weather during December signaled that the drought was still present - and becoming critically important to more and more people. The Charlotte area recorded an all-time record dry calendar year with just 26.23 inches of rainfall during 2001. Records have been kept in the area since 1878. Many communities initiated either mandatory or voluntary water restrictions. At Kings Mountain, NC - a new pump was required at Lake Moss because the water level dropped below 2 of the 3 existing pumps. Record low ground water supplies, lake levels, and stream flows were reported across all of Western North Carolina.
8/1/2002	The water supply situation reached crisis levels in some communities, as the effects of the long-term drought continued to plague western North Carolina. Particularly hard hit were several Piedmont communities along the Interstate 77 corridor. The city of Shelby was forced to buy water from surrounding communities and even from private companies and citizens. In Statesville, emergency construction of wells and a dam was necessary to prevent the city from running out of water, as the South Yadkin River reached historically low levels. Water levels on area lakes were as much as 10 feet below full pond. Most of the larger towns and cities along the I-77 corridor had imposed mandatory water restrictions by the end of the month, including the Charlotte metro area.
5/1/2004	A period of dry weather that began in August of 2003 resulted in moderate drought conditions across portions of western North Carolina by late spring of 2004. Streamflow and lake levels began to run below normal, and a few communities instituted water restrictions.
5/1/2007	The effects of an extended period of dry weather were exacerbated by an abnormally dry May, with many locations reporting one of the driest Mays in recorded history. By the end of May, many climatological stations were reporting yearly rainfall deficits as high as 10 inches. The result was severe to extreme drought conditions across much of western North Carolina by the end of the month. Water restrictions were implemented in some counties across extreme western North Carolina. The very dry conditions added to agriculture hardships caused by a hard freeze and widespread damaging winds in April.
6/1/2007	Despite an increase in thunderstorm activity, drought conditions persisted across much of western North Carolina. The persistent drought continued to cause hardships to agricultural interests that were still recuperating from the April freeze. Dollar values for the drought damage should be included in either the August or September Storm Data for this region.
7/1/2007	Drought conditions persisted across much of western North Carolina during July. By the end of July, voluntary water restrictions were instituted in almost all North Carolina counties along and west of I-

Location	Description
	77. Some mandatory restrictions were introduced in Union County, NC. Agricultural interests continued to be especially hard hit. The absence of rain negatively affected the hay crop, creating concern for the loss of livestock. Dollar values for the drought damage should be included in either the August or September Storm Data for this region.
8/1/2007	Severe to extreme drought conditions persisted across much of western North Carolina during August. By the end of the month, voluntary water restrictions continued in almost all North Carolina counties along and west of I-77. Stream flows and groundwater levels approached record low levels. Water levels on some reservoirs decreased by as much as 1 foot every 10 days. Agricultural interests continued to be especially hard hit, and the North Carolina governor requested federal disaster aid by the end of the month. Dollar values for the drought should be included in either the September or October Storm Data for this region.
9/1/2007	Extreme drought conditions persisted across western North Carolina through September, as the region experienced another month of well-below normal precipitation. By the end of the month, most locations were running a yearly rainfall deficit of 11-17 inches. Stream flows and groundwater levels were near record low levels, with many streams running at 5 percent or less of normal flow. Water levels on area reservoirs were some of the lowest in recorded history. Agricultural interests continued to be especially hard hit. Farmers continued to struggle to feed livestock due to a lack of hay and poor pasture conditions, forcing many cattle to be sold or slaughtered. Agricultural and other losses attributed to the drought are estimated to be in the hundreds of millions of dollars. County-based losses for the growing season will be included in next month's Storm Data.
10/1/2007	Unusually dry weather continued across western North Carolina through October. Although a soaking rain near the end of the month resulted in near-normal monthly precipitation for the mountains, the piedmont saw another month of well-below normal rainfall. Most areas were on pace to break yearly rainfall deficit records. By the end of the month, exceptional drought conditions were reported across the majority of the area. Water flow on area streams continued at 3 to 6 percent of normal, while lake levels remained at near-record lows. Although most cities and towns were requesting voluntary water restrictions be observed, mandatory restrictions were ordered in quite a few communities. In some areas, the water situation was becoming dire, with Monroe, NC officials reporting that water supplies would be exhausted by early 2008 if significant rain did not occur. Also, private wells were beginning to dry up in many areas. Agriculture continued to be severely impacted by the drought. As of this writing, county by county dollar estimates of drought damage have not been made available.
11/1/2007	November provided no relief from the effects of the long-term drought. In fact, another month of well-below normal rainfall made an already dire situation even worse. Many locations remained on pace to set annual records for rainfall deficit. By the end of the month, the vast majority of the region was experiencing exceptional drought conditions. Streamflow on area rivers remained extremely low, generally less than 10 percent of normal. Meanwhile, lakes continued to gradually fall toward record low levels.
12/1/2007	The latter half of December saw a transition to a wetter pattern across the southeast. Most observing stations in western North Carolina reported above normal monthly rainfall for the first time since January 2007. However, this was not enough to put much of a dent in the long-term drought as extreme to exceptional drought conditions persisted into the New Year. Although the increase in rainfall did allow for some recharge of area streams, many were still running at less than 25 percent of normal flow at the end of the month.
1/1/2008	January saw a return to dry weather across western North Carolina. Most observing stations across the region reported a rainfall deficit of 1 to 2 inches during the month, resulting in another month of exceptional drought conditions across most of the area. Water levels on area lakes remained within a foot or two of record low stages. However, rivers and streams remained somewhat recharged from the December rains, with streamflow on most waterways running 25 to 75 percent of normal.
6/1/2008	Although near normal rainfall was observed across much of the area during the late winter and early spring, another period of abnormally dry weather in May and June exacerbated severe to extreme

Location	Description
	drought conditions over the western Carolinas and northeast Georgia. Much of the area saw less than 2 inches of rain during this period of time. By the end of the month, much of the mountains and foothills of western North Carolina were running 10 inches below normal annual rainfall. Total rainfall deficits since the beginning of 2007 were around 20 inches or more in the hardest hit areas. By the end of the month, flow on almost all major streams was running less than 10 percent of normal. Many area crops suffered.
7/1/2008	Unusually dry weather continued through the month of July, with severe to extreme drought conditions persisting across the area. Afternoon and evening thunderstorms provided some degree of relief across portions of the North Carolina piedmont, but locations across Upstate South Carolina and extreme western North Carolina reported annual rainfall deficits of nearly 11 inches by the end of the month. Mandatory water restrictions were instituted across much of the North Carolina foothills. Water well levels began to descend below record low levels, most of which were recorded during the 1999-2002 drought. The vast majority of major streams across the area continued to run 1-10 percent of normal flow. Agriculture continued to be hard hit, with some areas reporting a 100 percent loss of the corn crop.
8/1/2008	Dry weather persisted across much of the area for most of August, although portions of the North Carolina Piedmont began to see relief from the dry conditions early in the month, due to an increase in daily thunderstorm activity. Elsewhere, exceptional drought conditions persisted and even expanded slightly westward to cover more of far western North Carolina and northeast Georgia. During the early part of the month, flows on most of the major streams across the area were running at record low levels, with the French Broad River setting a minimum flow record that had stood for almost 100 years. Only a handful of streams were running at more than 1 to 7 percent of normal. Groundwater levels were 2-5 feet below normal. Significant agricultural impacts persisted, with losses to summer crops, including hay, estimated at 30%. The dry weather also affected the livestock industry, due to shortages of pasture crops necessary for feeding. By the end of the month, Tropical Storm Fay had dropped up to 11 inches of rainfall across the area, providing some relief from the drought conditions, especially across the North Carolina Piedmont.
9/1/2008	The heavy rain brought by Tropical Storm Fay in late August provided some relief to the drought conditions across the area. This was particularly true across the North Carolina piedmont, where improving conditions were aided by normal September rainfall. However, another dry month resulted in a persistence of extreme to exceptional drought conditions across the North Carolina mountains and foothills. Voluntary water restrictions remained widespread during the month. A few communities held onto mandatory restrictions early in the month, but many of these were lifted by the end of the month. Well water remained near record low levels in many areas, while lake levels persisted well below normal stages. Rainfall from Fay resulted in some improvement in streamflows, although most rivers and major streams remained at less than 25 percent of normal, with many still running at less than 10 percent of normal. By the end of the month, government officials had requested a federal disaster declaration for most of the counties in the area, due to crop damages.

TABLE H.3: EXTREME HEAT

Date	Location
7/22/1998	Excessive heat plagued central North Carolina during July 22 through July 23. Maximum temperatures reached the 98 to 103-degree range combined with dew points in the 78 to 80-degree range with little wind to give heat index values of around 110 degrees for several hours each afternoon. To make matters worse, the minimum temperatures did not fall below 80 at several locations and those that did achieved that feat for only an hour or two. Strong thunderstorms ended the 2-day excessive heat ordeal on the evening of the 23 when rain cooled the environment enough to send temperatures into the lower 70s at most locations.
6/29/2012	A very hot and humid airmass that spent several days building west of the Appalachians finally made it east of the mountains, bringing very hot conditions to foothills and Piedmont of North Carolina. The high temperature at Charlotte-Douglas International Airport hit 104 degrees on both the 29th and 30th, tying the all-time high. The heat index hit 105 degrees. Excessive heat affected areas east of Charlotte. The ASOS at Monroe, NC reported a heat index value of 110 degrees on 30th. Lower dewpoints over the foothills resulted in sub-advisory and warning level heat index values. The heat lasted through July 1st, before thunderstorms brought somewhat cooler conditions.
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7/1/2012	Oppressive heat continued the first day of July, with Charlotte-Douglas International Airport tying its all-time record high temperature of 104 degrees for a 3rd consecutive day. The ASOS at Monroe reported a high temperature of 105 degrees with a max heat index of at least 111 degrees. Once again, Hickory in the foothills failed to reach even heat advisory criteria. Widespread thunderstorms developed during the afternoon hours, bringing a few days of relief from the heat.
7/1/2012	Oppressive heat continued the first day of July, with Charlotte-Douglas International Airport tying its all-time record high temperature of 104 degrees for a 3rd consecutive day. The ASOS at Monroe reported a high temperature of 105 degrees with a max heat index of at least 111 degrees. Once again, Hickory in the foothills failed to reach even heat advisory criteria. Widespread thunderstorms developed during the afternoon hours, bringing a few days of relief from the heat.
7/8/2012	Hot and humid conditions affected parts of the North Carolina Piedmont during the day. The high temperature at the Monroe ASOS was 100 degrees, with a heat index as high as 109 degrees. At Charlotte-Douglas International Airport the high was 101 and the heat index rose to 108 degrees.
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TABLE H.4: FLOOD EVENTS

Location	Date	Description
Cabarrus County		
Cabarrus County	1/23/2002	Persistent overnight and morning rainfall resulted in the flooding of a couple of roads. One was northeast of Concord, and another southeast of Mt. Pleasant.
Cabarrus County	3/20/2003	After morning flash flooding, moderating rainfall contributed to slower rises, but continued and additional flooding along numerous creeks and streams into the evening hours. Flooding was quite severe from Kannapolis to Concord, as well as across southern and eastern sections of the county. A nursing home and a school had to be evacuated due to rising water. At least 10 roads were closed across the county.
Cabarrus County	4/10/2003	After a night of moderate to heavy rainfall, flooding developed during the morning along some creeks and streams between Kannapolis and Concord, causing several roads to be closed. Water levels on the Rocky River increased to 20 feet above normal. Significant flooding also occurred along the Irish Buffalo Creek. In some areas, boats were required to ferry people to and from work.
Cabarrus County	4/18/2003	Persistent heavy rainfall resulted in slow rises and eventual flooding in the southern part of the county. Several fields were flooded, and 12 roads were closed.
Cabarrus County	5/22/2003	Persistent heavy rainfall resulted in slow rises along creeks and streams, which culminated in flooding that lasted for much of the day. Flooding began during the morning near Harrisburg, where a bridge and a road were flooded. Flooding slowly worsened through the afternoon and expanded to areas from Harrisburg to Midland, and from Kannapolis to Concord.
Cabarrus County	5/25/2003	Slow rises along creeks and streams culminated in a few flooded roads in the Harrisburg and Mt Pleasant areas.
Cabarrus County	9/8/2004	After earlier flash flooding, general flooding continued through the early afternoon. The Rocky River continued to be the main stream affected, but gradual rises eventually culminated in flooding along additional streams as well.
Cabarrus County	9/28/2004	Although moderating rainfall rates resulted in more gradual rises along creeks and streams, flooding expanded and became widespread later in the morning. By mid-morning, numerous roads were closed. A school in Cabarrus County was evacuated when it was threatened by rising water. In Rowan County, several motorists had to be rescued after driving their vehicles through flood water.
Cabarrus County	6/2/2005	Flooding first began along several creeks in the Midland area, including Clear, Muddy, and Little Meadow, as well as some small tributaries of the Rocky River. Later in the morning, the Rocky River flooded in the northwest part of the county, near Poplar Tent Rd. Several roads were closed due to high water, including Hopewell Church Rd, where several homes were surrounded by high water.
Cabarrus County	7/4/2005	Heavy rain falling over Rowan County produced flooding along Irish Buffalo Creek near Kannapolis. This required evacuation of around 70 people from a nursing home and a mobile home park.
COUNTYWIDE	9/1/2000	Heavy rain from slow-moving thunderstorms caused a considerable amount of standing water and minor flooding on secondary roads.
CONCORD	7/22/2002	A few streets were flooded.
COUNTYWIDE	12/15/2005	Flooding developed after an extended period of moderate to heavy rain. Approximately 7 roads were closed due to high water conditions.
CONCORD	11/22/2006	Flooding developed along portions of the Rocky River, some of its tributaries, and along other streams, including Back Creek when 4 to 5 inches of rain fell in

Location	Date	Description
		about an 18 hour period. Several roads were closed, including Mt Pleasant Rd, Pharr Mill Rd, and Stallings Rd, and highway 200 in Harrisburg.
KANNAPOLIS	8/27/2008	Although flash flooding ended across the area by mid-morning, stream levels remained elevated, and in some cases continued to slowly rise into the afternoon hours. In fact, the South Fork River did not crest until mid-evening. Numerous roads remained closed through the day.
GLASS	7/22/2009	Although heavy rain ended, water levels remained high from the city limits of Concord southwest to Stough Rd for several hours during the early morning.
ROBERTA MILLS	11/11/2009	Flooding continued along portions of Back Creek and the Rocky Broad River into the evening hours. Total rainfall amounts of 4-5 inches occurred, mostly within a 24-hour period.
ROBERTA MILLS	1/26/2010	Although heavy rainfall ended over the county during the early morning hours, runoff from the rainfall caused high water conditions to persist until after sunrise. The main stream affected was the Rocky River, which went well above itï¿½ï¿½ï¿½s established flood stage.
ROBERTA MILLS	2/5/2010	A gauge on The Rocky River exceeded established flood stage above Irish Buffalo|Creek, indicating flooding of Pharr Mill Rd and Mount Pleasant Rd.
HARRISBURG	12/23/2013	The Rocky River went into flood during the afternoon hours of the 23rd after widespread rainfall of around 3 inches fell over the headwaters of the river. Several roads were flooded along the Rocky River, including Stallings Road, Pharr Mill Road and Mt Pleasant Road. Back Creek also flooded a road near the intersection of Robinson Church and Stallings Roads near Middleton and Rocky Meadows Subdivisions.
ROCKY RIVER	3/7/2014	Emergency Manager reported flooding of Stallings Rd and Pharr Mill Rd.
MT PLEASANT ARPT	3/7/2014	Emergency Manager reported multiple roads flooded across the exreme eastern portion of Cabarrus County, particularly in the Midland and Mount Pleasant areas.
ROCKY RIVER	10/3/2015	Although rain began to taper off by late-morning, runoff from earlier rainfall resulted in a stream gauge on the Rocky River exceeding flood stage during late morning, indicating that Back Creek was likely flooding Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	11/2/2015	County comms and stream gauges reported flooding developed across mainly the southern part of the county, after about 3 inches of rain fell in a 36-hour period, with most of that falling during the morning of the 2nd. Water from the Rocky River backed into Back Creek, flooding Stallings Rd, Pharr Mill Rd, and Rocky River Rd in Harrisburg. Other closed roads included Bethel Ave Exd, Hopewell Church Rd, and Pine Bluff Rd, all in Midland.
ROCKY RIVER	11/10/2015	After more than two inches of rain fell across much of Cabarrus County in about 24 hours, a stream gauge on the Rocky River near Irish Buffalo Creek exceeded the established flood stage, eventually by more than a foot. This indicated water backing into Back Creek from the Rocky River was causing flooding of Stallings Rd and Pharr Mill Rd, and that the Rocky River was likely flooding Poplar Tent Rd.
ROCKY RIVER	12/23/2015	After 2.5 to 4 inches of rain fell over Cabarrus County in about 2 days, a stream gauge on the Rocky River exceeded established flood stage during the late evening of the 23rd, and remained there through the morning of the 24th. High water backing into Back Creek resulted in flooding of Pharr Mill Rd as well as Stallings Rd.
ROBERTA MILLS	12/30/2015	Although heavy rain tapered off across Cabarrus County by late afternoon, runoff from the earlier heavy rainfall, along with the occasional moderate to

Location	Date	Description
		heavy rain shower, resulted in only slow recession of flood water into the evening hours.
MIDLAND	12/30/2015	While flood waters receded across much of Cabarrus County, continued runoff resulted in persistent flooding along the Rocky River and some of its tributaries through the morning of the 31st. Affected roads included Pharr Mill, Stallings, Hopewell Church, Bowman Barrier, Cox Mill Roads and portions of Highway 200.
ROCKY RIVER	4/24/2017	Gradual stream rises developing as a result of 4 to 6 inches of rain falling over about a 48-hour period resulted in flooding of streams and roads across Cabarrus County during the morning of the 24th and continuing through much of the day. The main streams impacted were tributaries of the Rocky River, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek.
ROCKY RIVER	9/16/2018	Although heavy rain ended across Cabarrus County during the evening flooding continued along the Rocky River and its tributaries through daybreak.
ROCKY RIVER	10/11/2018	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall of around 2 inches fell within the basin throughout the morning of the 11th. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	11/13/2018	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall of around 2 inches occurred within the basin over a period of several hours. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	11/15/2018	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall 1 to 2 inches fell within the basin, which was already saturated due to an extended period of wet weather. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	12/20/2018	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall of around 2 inches fell within the basin in about 24 hours. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	2/22/2019	A stream gauge on the Rocky River near Irish Buffalo Creek exceeded its established flood stage after widespread rainfall of around 2 inches fell within the basin in about 24 hours. Multiple tributaries of the river overflowed and flooded roads, including Pharr Mill Rd and Stallings Rd.
ROCKY RIVER	2/6/2020	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed mainly along tributaries of the river including Back Creek Irish Buffalo Creek and Dutch Buffalo Creek after 2 to 4 inches of rain fell across Cabarrus County in around 24 hours. Multiple roads were inundated including Stallings Rd Poplar Tent Rd Bowman-Berrier Rd Mount Pleasant Rd and Highway 200.
ROCKY RIVER	4/30/2020	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed, mainly along tributaries of the river, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek after 2 to 3.5 inches of rain fell across the basin in just a few hours. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Mount Pleasant Rd, and Highway 200. An 82-year-old man drowned in his vehicle after driving around a barrier where Miami Church Road crossed Dutch Buffalo Creek.
ROCKY RIVER	5/20/2020	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed, mainly along tributaries of the river, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek after 2 to 3 inches of rain fell across Cabarrus County in around 36 hours. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Mount Pleasant Rd, and

Location	Date	Description
		Highway 200. Periods of continues showers and thunderstorms that continued into the 21st resulted in the streams remaining above flood stage for more than 24 hours.
ROCKY RIVER	5/27/2020	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed, mainly along tributaries of the river, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek after 2 to 2.5 inches of rain fell across Cabarrus County in around 12 hours. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Mount Pleasant Rd, and Highway 200.
ROCKY RIVER	11/12/2020	Although heavy rain tapered off across Cabarrus County throughout the afternoon into the evening, runoff from the earlier rainfall maintained elevated stream levels which continued to flood roads throughout the overnight hours.
ROCKY RIVER	4/8/2023	A stream gauge on the Rocky River above Irish Buffalo Creek indicated flooding developed, mainly along tributaries of the river, including Back Creek, Irish Buffalo Creek, and Dutch Buffalo Creek after 2.5 to 3.5 inches of rain fell across Cabarrus County in around 36 hours. Multiple roads were inundated, including Stallings Rd, Poplar Tent Rd, Bowman-Berrier Rd, Mount Pleasant Rd, and Highway 200.
ROCKY RIVER	1/9/2024	Although heavy rain tapered off across Cabarrus County throughout the evening, runoff from the earlier rainfall maintained elevated stream levels along tributaries of the Rock River which continued to flood roads throughout the overnight hours.
Stanly County		
Stanly County	1/6/1998	River Flooding began on the Rocky River at Norwood during the evening and continued for 2 days. The crest at Norwood was 17.1 feet or 2.1 feet above the flood stage of 15 feet. Heavy rain during the afternoon and evening in the Rocky River basin produced the flooding that affected mainly farmland adjacent to the river.
Stanly County	1/27/1998	A soaking rain fell over central North Carolina during January 27 into the early afternoon hours of January 28th. The rain became heavy in many locations during the 28th. Flooding caused many rural county roads to become impassable and many had to be closed. In addition to the rapid rises in streams and creeks in these counties, river flooding was well underway due to the excessive rainfall for the month of January. Continuous storm systems brought heavy precipitation to central North Carolina during the month, with a major storm ending the month with flooding and river flooding.
Stanly County	2/17/1998	The Rocky River at Norwood crested at 7.0 feet above flood stage during February 17th.
Stanly County	3/20/2003	Persistent heavy rain brought widespread flooding across central North Carolina, beginning in the morning of March 20 and continuing into the afternoon. Numerous roads across the area had to be closed due to flooding, and numerous creeks overflowed their banks. Rainfall amounts were mainly between 2 and 4 inches in less than 12 hours. The heaviest rain fell in Forsyth County, where major flooding occurred along Muddy Creek, Mill Creek, and Grassy Creek, and several water rescues were needed.
Stanly County	4/10/2003	Persistent showers and thunderstorms produced heavy rain and flooding across the Piedmont of North Carolina. Several creeks and streams overflowed their banks, leading to road flooding and numerous road closures. Some basements

Location	Date	Description
		of homes were flooded in Guilford County, and a water rescue was made in Moore County.
MISENHEIMER	2/5/2010	Heavy rain resulted in widespread minor flooding across the county. Several roads were closed due to flooding including Matton Grove Road at Wesley Chaple road, Mountain View Church Road and East Park Road. Hill Ford Bridge at Hill View Road was also under water.
STANFIELD	3/7/2014	Multiple roads flooded in the county.
NORWOOD	9/17/2018	Heavy rainfall of 6 to 8 inches caused widespread flooding across the county. Combined with additional rainfall upstream, the rainfall caused all-time record major flooding along the Rocky River near Norwood. Flooding damaged approximately 142 structures throughout the county, destroying 3 and resulting in over $3.63 million in property damage and at least $20 million in crop damage. Numerous roads were flooded all throughout the county. The Rocky River overflowed the Highway 52 bridge and reached the base of the Plank Road bridge.
Union County		
Union County	1/27/1996	Prolonged rain became heavier following the ice. the rain increased into the night when some thunderstorms moved in from the west. Rainfall became excessive, more than 3 and 4 inches in some cases, causing flooding to begin by mid evening. At Asheville the flooding caused a wall to collapse onto several parked cars causing extensive damage. Numerous roads were closed around the mountains and foothills. Several major rivers flooded including the French Broad and the Oconoluftee. Evacuations were required in several counties because of flooding. In this event the flooding was not severe in the northern mountains.
Union County	8/31/2002	Pebble Creek overflowed its banks, flooding a golf course in the northwest part of the county. Many roads were also flooded.
Union County	10/13/2002	Heavy morning rainfall resulted in flooding in at least one subdivision. A retention pond overflowed in Savannah Hills, resulting in flooding of roads in the neighborhood.
Union County	3/6/2003	A number of small streams and roads flooded throughout the county.
Union County	3/20/2003	After early morning rain caused flash flooding across the area, moderating rainfall resulted in slower rises, but continued and additional flooding along creeks and streams. Numerous roads flooded, and several motorists were stranded due to high water.
Union County	4/10/2003	After a night of moderate to heavy rainfall, some overflowing creeks began flooding adjacent roads and low bridges. The flooding gradually worsened throughout the day and evening.
Union County	9/28/2004	After earlier flash flooding, moderating rain rates led to more gradual rises along creeks and streams, but general flooding continued. Numerous small streams and low-lying areas remained flooded through late morning.
Union County	6/2/2005	After a night of moderate to heavy rain, flooding developed along some creeks in the northern part of the county during the morning. The first stream that flooded was Goose Creek, which flooded near the intersection of highways 601 and 218. Flooding from the South Fork of Crooked Creek later threatened a home on station road. Several roads were closed because of high water, including Goldmine, Mill Grove, and Matthew-Weddington roads.
MONROE	7/24/1999	Clusters of slow-moving thunderstorms developed during the afternoon on another hot and humid summer day. Some of the storms became severe, producing large hail the size of nickels and quarters, and straight-line winds which downed numerous trees. In Kannapolis, the roof of a commercial building was blown off. The Gastonia area experienced a severe thunderstorm which

Location	Date	Description
		lasted nearly an hour. Numerous trees and power lines were downed, some of which fell on a trailer and homes. Urban flooding in normally flood-prone areas stranded a few cars and lightning strikes caused several house fires. In rural areas around Monroe, small streams briefly came out of their banks and flooded typical flood-prone areas.
COUNTYWIDE	6/23/2006	High water conditions continued for several hours after flash flooding ended, as moderate to occasionally heavy rainfall continued across the county. A motorist drove into high water on East Sandy Springs and required rescue. This prompted the county to close 6 roads in the area.
MONROE	11/22/2006	Numerous roads and bridges flooded when 4 to 6 inches of rain fell in about an 18-hour period. Poor drainage and stream flooding were involved, as Twelvemile Creek, Crooked Creek, Stewarts Creek, Bearskin Creek, and several other streams overflowed their banks. Two men had to be rescued when their car was swept off of Ridge Rd by flood water from Crooked Creek.
INDIAN TRAIL ARPT	3/1/2009	Quite a few roads were closed due to flood water across central and northern portions of the county. Some flooding was the result of overflowing streams, while some was caused by poor drainage. Affected roads included but were not limited to Macedonia Church Rd, Antioch Church Rd at Highview Rd, Howey Bottoms Rd at Duncan Rd, and Jackson and Benton Streets in the city of Monroe.
FAIRVIEW	2/5/2010	A stream gauge along Goose Creek indicated the stream briefly exceeded established flood stage, flooding a few roads in locations near the junction of highway 218 and highway 601.
FAIRVIEW	7/12/2010	Flooding continued in the Goose Creek Basin through the evening, and progressed downstream to Fairview, where additional flooding developed near the highway 218 and 601 junction.
INDIAN TRAIL ARPT	7/15/2014	Although heavy rainfall ended across northern Union County by 9 pm, flooding continued in the Goose Creek basin, as excessive runoff continued to work its way downstream, with a stream gauge near Fairview eventually exceeding the established flood stage after 1 AM on the 16th.
INDIAN TRAIL ARPT	8/18/2015	Although heavy rain ended in the Crooked Creek basin by late evening of the 18th, the stream remained out of its banks until well after midnight, flooding several roads, especially at Ridge Rd, which was actually covered in water until daybreak of the 19th.
FAIRVIEW	8/19/2015	Although heavy rain ended in the Goose Creek basin by mid-evening of the 19th, continued runoff resulted in the stream remaining out of its banks and flooding several roads, including the intersection of Highways 218 and 601, until well after midnight.
WESLEY CHAPEL	11/2/2015	County comms and emergency manager reported flooding developed across the central part of the county during the afternoon, after more than 3.5 inches of rain fell in about a 36-hour period, with much of that falling during the morning and early afternoon of the 2nd. The main streams involved included tributaries of Twelvemile Creek, which flooded multiple roads, including Shannon Rd between Mineral Springs and Weddington. Many homes along Shannon Rd were cut off from passable roads by early evening. Public reported portions of Griffin Memorial Park flooded by Bearskin Creek. A small stream feeding into Lake Lee flooded a bridge. Portions of Stack Rd in Monroe and Potter Rd in Waxhaw were also closed due to high water.
WEDDINGTON	11/19/2015	After more than 2.5 inches of rain fell across much of Union County in about 24 hours, county comms reported flooding developed, especially across the western part of the county. Flooded roads included Antioch Church Rd in

Location	Date	Description
		Weddington, Shannon Rd, Bigham Rd, and Billy Howell Rd in Waxhaw, and Trinity Church Rd and Medlin Rd near the South Carolina border.
INDIAN TRAIL	12/22/2015	County comms reported quite a bit of flooding developed, mainly across the northwest part of the county after around 2 inches of rain fell in about a 12-hour period. The main streams affected included South Fork Crooked and Twelvemile Creek and tributaries. Crooked Creek flooded portions of Sardis Church Rd, Lawyers Rd, and Friendly Baptist Church Rd. Additional roads flooded included Shannon Rd (due to flooding of Little Twelvemile Creek), Austin Chaney Rd, and multiple roads off Highway 74 in the Indian Trail area.
FAIRVIEW	12/30/2015	Although heavy rainfall tapered off across Union County by early evening, continued runoff from the earlier heavy rainfall resulted in only slow recession of flood water through the evening hours.
INDIAN TRAIL ARPT	4/24/2017	Public reported the South Fork of Crooked Creek overflowed its banks and flooded a portion of Lawyers Rd.
OLIVE BRANCH	9/16/2018	Although heavy rain ended across Union County during the evening, EM reported high water conditions continued through the overnight, as waters were slow to recede in light of the 7 to 13 inches that fell across the county in about 24 hours. During the morning of the 17th, an 88-year-old man drowned when he drove his vehicle through a swollen tributary on Landsford Dr.
INDIAN TRAIL ARPT	2/6/2020	Although heavy rainfall tapered off across Union County into the evening, runoff from the earlier rainfall resulted in high water conditions persisted, with multiple roads remaining closed through late evening.

TABLE H.5: HAIL EVENTS

Location	Date	Size (in)	Description
Cabarrus County			
Cabarrus County	4/28/1959	1.25”	
Cabarrus County	4/13/1970	1.75	
Cabarrus County	6/21/1970	2	
Cabarrus County	5/16/1982	1	
Cabarrus County	3/8/1983	1.25	
Cabarrus County	4/14/1984	1.75	
Cabarrus County	6/4/1985	1.75	
Cabarrus County	6/5/1985	4.5	
Cabarrus County	6/5/1985	1	
Cabarrus County	6/5/1985	0.75	
Cabarrus County	6/5/1985	1	
Cabarrus County	4/24/1987	1	
Cabarrus County	8/29/1987	0.75	
Cabarrus County	7/8/1990	1	
Cabarrus County	8/7/1991	0.88	
Cabarrus County	4/30/1992	1.75	
Concord	5/19/1993	0.75	
Mt Pleasant	5/1/1995	0.88	
NE Concord	7/6/1995	1	Several reports of trees down.
CONCORD	8/28/1997	1	Severe thunderstorms caused wind damage and hail in the southern Piedmont. Trees were blown down in scattered locations from Kings Mountain across Gaston county, to the Charlotte-Douglas International Airport area. A more powerful downburst apparently occurred around Mineral Springs where 20 to 25 trees were downed, homes suffered damage, and a business was partly unroofed.
HARRISBURG	3/20/1998	1	Deep low pressure moved through the Tennessee and Ohio River Valleys on the 20th, pushing a strong cold front east across western North Carolina. Severe thunderstorms developed in a very unstable airmass during the morning in the mountains and the piedmont during the mid-afternoon. Straight-line wind damage resulted in several downed trees. A weak, short-lived tornado was observed by a woman in Mint Hill to briefly touchdown in front of her stopped car. Tornado damage was confined to trees and power lines. Hail up to 2 inches in diameter did quite a bit of damage - especially in the Mint Hill area where dollar

Location	Date	Size (in)	Description
			amounts were unknown, but considered very high. Hail piled up to a depth of 2 feet in Pineville and twin rope funnel clouds were observed as well. A couple of roads were washed out in western Caldwell county as excessive rain fell on the higher elevations of the county.
MIDLAND	4/3/1998	1.75	A strong spring storm system moved northeast through the Tennessee Valley on the 3rd. A couple thunderstorms along the occluded front that passed across the mountains became severe and produced hail up to quarter size. Other severe thunderstorms developed along a thermal-moisture boundary in the piedmont and produced hail up to 2 inches in diameter.
KANNAPOLIS, CONCORD	5/7/1998	2.75	Supercell thunderstorms developed in a highly sheared atmosphere in eastern Tennessee then moved east across the mountains, foothills and western piedmont of North Carolina. These long-lived, cyclic supercells produced a considerable amount of large hail and some damaging winds in the mountains.
KANNAPOLIS	5/8/1998	0.75	An isolated severe thunderstorm downed three large trees and produced grape size hail.
CONCORD	5/27/1998	0.75	A frontal boundary in the area again provided the focus for thunderstorm development during the afternoon of the 27th. Many storms became severe across western North Carolina and produced hail ranging in size between dimes and quarters. Severe straight-line winds downed numerous trees and power lines, some on houses, in Sylva and Brevard. A few cars were damaged as well. Several trees and power lines were downed in Cornelius later in the afternoon. Lightning struck an apartment in Hickory and caused an attic fire.
KANNAPOLIS	5/2/2000	0.75	A cluster of strong to severe thunderstorms tracked east across the western piedmont during the early evening. The storms produced dime to golf ball size hail and some wind damage. The most severe storm occurred in Lincoln county where golf ball size hail fell for 10 minutes and piled high enough to survive the night and still be on the ground the next morning. Icy roads and dense fog developed along NC Hwy 27 East out of Lincolnton as a result of the hail's longevity. Scattered trees and limbs were also blown down around Lincolnton and south of Denver.
CONCORD	5/13/2000	1	Thunderstorms developed in the mountains in the early afternoon with several becoming severe a few hours later. Other severe thunderstorms moved into or developed in the foothills and piedmont during the early evening. Hail up to the size of walnuts and some wind damage occurred in the mountains and foothills. Several trees were blown down near Fairview. In Cleveland county, 1.5-foot diameter trees were blown down in Belwood, and a number of structures were damaged in Polkville. Just west of Lincolnton several trees and power lines were downed, some on mobile homes. Lightning from the storm in Lincolnton knocked out power to the 911 center. Numerous trees and power lines were downed and a couple of storage buildings were blown over northeast of Gastonia. In Dallas, a trailer park sustained damage to a storage building, 3 young Bradford pear trees, underpinning, a power meter, and heavy doghouse. Mecklenburg county police reported 7 to 10 trees downed north of Charlotte. Considerable damage occurred in Cabarrus county with numerous trees blown down through the northern and central parts of Concord. Winds were estimated as high as 70 mph in western Cabarrus county due to a significant number of downed trees, with many on houses and some blocking roads. Crews had to work most of the night to clear trees and restore power. A deputy said he observed a tornado touch down, lift, and touch down again before ending as a waterspout over Coddle Creek Reservoir. However, there was not enough evidence to confirm the event as a tornado.

Location	Date	Size (in)	Description
CONCORD	4/1/2001	0.75	
HARRISBURG	7/5/2001	1.25	Half-dollar-sized hail reported at Lowes Motor Speedway.
HARRISBURG	7/3/2002	1	
HARRISBURG	7/4/2002	0.88	Reported on Highway 49.
CONCORD	7/22/2002	0.75	
CONCORD	5/3/2003	1	
MT PLEASANT	5/3/2003	0.88	
HARRISBURG	5/3/2003	0.75	
KANNAPOLIS	6/7/2005	1	
MT PLEASANT	4/22/2006	0.75	Penny size hail and large tree limbs down on Lentz Harness Shop Rd.
KANNAPOLIS	5/14/2006	1.75	
CONCORD	5/14/2006	1.75	Golf ball hail reported at exit 60 on Interstate 85.
CONCORD	5/14/2006	1.75	Golf ball hail reported at exit 60 on Interstate 85.
CONCORD	5/18/2006	1	
CONCORD	5/18/2006	0.75	
KANNAPOLIS	5/18/2006	1	
CONCORD	6/10/2006	1.75	
HARRISBURG	6/10/2006	1	Quarter size hail near the intersection of Rocky River Rd and Hickory Ridge Rd.
CONCORD	6/12/2006	0.75	
MT PLEASANT	8/7/2006	0.75	Reported at the intersection of Mount Pleasant Rd and highway 49.
CONCORD	4/15/2007	1	Severe thunderstorms developed during the early afternoon hours over the foothills and western Piedmont of North Carolina.
KANNAPOLIS	5/12/2007	0.75	Severe storms produced large hail over the North Carolina Foothills and Piedmont during the afternoon hours.
CABARRUS	6/24/2007	0.75	Reported on highway 601 south of Concord.
KANNAPOLIS	6/25/2007	0.88	Scattered severe storms developed over western North Carolina during the afternoon and evening hours.
CONCORD	6/26/2007	0.75	Scattered severe storms developed over western North Carolina. Most of the storms occurred during the late afternoon and evening hours.
MT PLEASANT	4/20/2008	0.75	Reported on Pickens Rd.
ROBERTA MILLS	4/26/2008	0.75	Reported at Poplar Tent Rd and I-85.
CONCORD	4/26/2008	0.88	Scattered severe storms affected western North Carolina during the afternoon and evening hours.
CONCORD	5/9/2008	1	Severe storms developed over western North Carolina during the evening hours and produced large hail.
GLASS	5/11/2008	1	Reported at the intersection of highway 73 and Odell School Rd.
CONCORD	5/11/2008	2.75	An isolated supercell thunderstorm developed over the South Mountains in the North Carolina Piedmont. The storm then tracked east, producing large to very large hail and brief tornadoes during its 3-hour lifetime. There was quite a bit of hail damage, particularly in the city of Concord in Cabarrus County, though no damage estimates were available.
NORTH CONCORD	5/11/2008	1.75	Reported on Kidd Ct.
CABARRUS	5/11/2008	0.88	Reported at Branch View Rd and South Union Rd.
JACKSON PARK	5/11/2008	1	Reported at highway 601 and highway 29.
CONCORD	5/11/2008	1	An isolated supercell thunderstorm developed over the South Mountains in the North Carolina Piedmont. The storm then tracked east, producing large to very large hail and brief tornadoes during it's 3 hour lifetime. There was quite a bit of

Location	Date	Size (in)	Description
			hail damage, particularly in the city of Concord in Cabarrus County, though no damage estimates were available.
MT PLEASANT	5/11/2008	1.75	Hail covered the ground.
GLASS	5/20/2008	0.88	Reported on Golden Desert Ct.
CONCORD	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
CONCORD	5/20/2008	1	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
CONCORD	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
CONCORD	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
CONCORD	5/20/2008	0.75	Several clusters of severe thunderstorms developed over western North Carolina during the afternoon and evening hours ahead of a cold front.
MIDLAND	6/11/2008	0.88	Scattered severe storms affected western North Carolina during the evening hours.
CONCORD	6/22/2008	1	Hail lasted for several minutes.
ROBERTA MILLS	6/22/2008	1	Severe storms developed over the North Carolina mountains during the early afternoon hours. The storms progressed eastward during the afternoon and evening affecting much of western North Carolina.
WEST CONCORD	6/22/2008	0.88	Severe storms developed over the North Carolina mountains during the early afternoon hours. The storms progressed eastward during the afternoon and evening affecting much of western North Carolina.
WATTS XRDS	4/10/2009	1	Elevated thunderstorms produced large hail over the Piedmont and foothills of western North Carolina.
ROBERTA MILLS	4/10/2009	1.25	Numerous hail reports were received in this area. Reports included penny size hail near the Lowes Motor Speedway, several quarter size hail reports in the Concord area and half dollar sie hail in Mount Pleasant.
NORTH CONCORD	7/22/2009	0.75	Hail was reported near I-85 on the north side of town.
CABARRUS	7/23/2009	0.75	Scattered thunderstorms developed over the North Carolina Foothills. A few of the storms produced large hail and wind damage.
JACKSON PARK	3/28/2010	1	Hail, up to the size of quarters, was reported to be covering the ground.
MT PLEASANT ARPT	6/29/2010	1.25	Scattered thunderstorms developed over western North Carolina during the afternoon hours. With moderate wind shear over the region, a couple multicell severe storms developed.
WATTS XRDS	7/20/2010	0.88	Scattered thunderstorms developed in a moist airmass over western North Carolina during the afternoon hours. A few of the thunderstorms produced small areas of wind damage and a little small hail.
JACKSON PARK	5/27/2011	1.75	Golf ball size hail fell from International Dr near I-85 into Kannapolis.
JACKSON PARK	6/11/2011	1	Quarter size hail near the intersection of Poplar Tent Rd and George Liles Parkway.
MT GILEAD	6/11/2011	0.75	Dime size hail fell at the intersection of Centergrove Rd and Camp Julia Rd.
ROBERTA MILLS	6/11/2011	0.75	Dime size hail was reported on Bruton Smith Bvd.
KANNAPOLIS	6/28/2011	1.5	Larger than half dollar size hail on highway 127 in the Viewmont community.
JACKSON PARK	9/2/2011	0.88	While the wind shear was fairly weak over western North Carolina, a very unstable atmosphere and hot temperatures resulted in scattered thunderstorm activity over the region. A few of the storms produced areas of damaging straight-line winds and even some large hail as they drifted slowly to the south.

Location	Date	Size (in)	Description
CONCORD	9/27/2011	0.75	Scattered showers and thunderstorms developed late in the day along a strong cold front. A few of the storms produced wind damage and small hail.
MIDLAND	3/24/2012	0.88	Multiple reports of up to nickel size hail were received along highway 601 north of Midland.
HARRISBURG	5/21/2013	1	Scattered, disorganized thunderstorms developed over the North Carolina Piedmont, and eventually the mountains, during the afternoon hours. A few of the storms became severe, producing large hail and wind damage.
CONCORD	6/13/2013	1.5	Large hail was reported near Concord.
BARRIERS MILL	6/28/2013	1	Quarter size hail was reported a few miles south of Mount Pleasant.
CONCORD	5/10/2014	1	Two public reports of quarter size hail were received from the Concord area.
MT PLEASANT	6/10/2014	1	EM reported quarter size hail near Mount Pleasant. Public reported nickel to quarter size hail off North Dr (1 NNE).
MT PLEASANT	6/10/2014	0.88	FD and county comms reported nickel size hail in the Mount Pleasant area.
CONCORD	6/11/2014	0.75	HAM radio operator reported 3/4 inch hail on Firelight Ct at Highway 601.
WATTS XRDS	9/2/2014	0.75	Public reported 3/4 inch hail on Rock Olive Dr.
GLASS	4/20/2015	1	Multiple spotters and public reports of dime to quarter size hail were received between Kannapolis and Concord. Public reported quarter size hail 8 6 NNW Mount Pleasant.
HARRISBURG	4/20/2015	1	Spotter and the public reported quarter size hail near Harrisburg.
FLOWS STORE	4/20/2015	0.88	FD reported nickel size hail.
CONCORD	6/22/2015	0.75	Public reported 3/4 inch hail near downtown Concord.
WEST CONCORD	5/2/2016	1	Public reported quarter size hail at the intersection of Highways 49 and 601.
CONCORD	5/2/2016	0.75	Public reported 3/4 inch hail in downtown Concord.
CABARRUS	7/19/2016	0.75	Public reported 3/4 inch hail near Midland.
GLASS	3/1/2017	1	Public reported quarter size hail near Bethpage Rd and South Main St. At least one other report of nickel to quarter size hail was received in the Kannapolis area.
KANNAPOLIS	3/1/2017	1	HAM radio operator reported quarter size hail on south Main Street.
HARRISBURG	3/21/2017	2.5	Public reported golf ball to tennis ball size hail near Harrisburg.
ROCKY RIVER	3/21/2017	2.75	Public reported ping pong ball to baseball size hail covering the ground on Moss Creek Drive.
CONCORD	7/23/2017	0.88	Spotter reported nickel size hail near Concord.
KANNAPOLIS	5/4/2019	1.5	Public reported quarter size hail in the Kannapolis area. Emergency manager reported ping pong ball size hail on Pless St in Concord.
ROBERTA MILLS	5/4/2019	1	Public reported quarter size hail.
FLOWS STORE	5/11/2019	0.88	Spotter reported nickel size hail near Geneva Road and Lower Rocky River Road.
ROBERTA MILLS	3/27/2021	1.75	Multiple public reports of quarter to golf ball size hail along Highway 73 in western Cabarrus County from near Coddle Creek reservoir to the west side of Concord.
MT PLEASANT	3/27/2021	1	Public reported quarter size hail near Mount Pleasant.
ROCKY RIVER	5/21/2022	0.88	Public reported nickel size hail.
GLASS	6/14/2022	1	Public reported quarter sized hail on Odell School Rd.
JACKSON PARK	6/14/2022	1	Public reported dime to nickel sized hail in the Poplar Tent community.
GLASS	6/16/2022	1	Public reported quarter size hail.
ROBERTA MILLS	4/22/2023	0.75	Public reported 3/4 inch hail via mping project.
ROBERTA MILLS	6/26/2023	1.5	Public reported (via Social Media) ping pong ball size hail along Pitts School Rd north of the Speedway and quarter size hail closer to Harrisburg.

Location	Date	Size (in)	Description
KANNAPOLIS	6/26/2023	1	Public reported quarter size hail in the Kannapolis area.
MT PLEASANT	6/4/2024	1	Public reported up to quarter size hail in Mount Pleasant.
RIMER	7/16/2024	1	Public reported marble to quarter size hail.
Stanly County			
Stanly County	6/26/1961	2”	
Stanly County	5/20/1967	1.75	
Stanly County	6/22/1978	1.75	
Stanly County	7/16/1981	2	
Stanly County	3/8/1983	1	
Stanly County	3/8/1983	1.75	
Stanly County	6/6/1985	1.25	
Stanly County	8/29/1987	1.75	
Stanly County	8/29/1987	2.75	
Stanly County	8/29/1987	2.75	
Stanly County	8/29/1987	2.75	
Stanly County	5/16/1988	1.75	
Stanly County	9/10/1990	0.75	
Stanly County	10/25/1990	0.88	
Stanly County	4/24/1992	0.75	
Albemarle	3/24/1993	1.75	
Oakboro	5/19/1993	0.75	
Locust	9/25/1994	1	
Near Albemarle	4/30/1995	1.75	Sheriff's Department reported golf ball-size hail in the north-eastern part of the county.
ALBEMARLE	5/24/1996	1.5	
BADIN	6/13/1997	0.75	DIME SIZE HAIL FELL IN BADIN AND ALBEMARLE.
NORWOOD	4/3/1998	1	
STANFIELD	4/3/1998	0.75	
MILLINGPORT	5/27/1998	0.75	
OAKBORO	6/10/1998	0.88	
OAKBORO	7/22/2000	0.75	Dime size hail reported on NC 138.
OAKBORO	3/31/2002	1.25	
LOCUST	7/1/2002	0.75	
BADIN	5/3/2003	0.88	
AQUADALE	5/3/2003	2.75	
ALBEMARLE	5/3/2003	1.75	
RICHFIELD	4/22/2006	0.75	PENNY SIZE HAIL REPORTED ON ROUTE 49 IN RICHFIELD.
RICHFIELD	5/14/2006	2.5	
NEW LONDON	5/18/2006	0.75	
ALBEMARLE	6/23/2006	0.75	Reported near Lake Tillery.
ALBEMARLE	6/23/2006	0.75	
ALBEMARLE	8/3/2006	0.75	Reported on US HWY 52.
ALBEMARLE	4/15/2007	1	Three rounds of severe weather struck Central North Carolina from the morning hours through the afternoon and into the evening. Widespread reports of damaging winds and large hail occurred with a rapidly intensifying surface low and attendant cold frontal passage. A powerful 70 knot low-level jet also aided in the initial round of severe storms. Thunderstorms re-developed in the late

Location	Date	Size (in)	Description
			afternoon and evening hours as an amplifying upper level shortwave trough rotated across Central North Carolina.
NEW LONDON	5/9/2007	0.75	Reported at New London High School on Highway 52.
ALBEMARLE	5/12/2007	0.75	In addition to penny size hail, a 16 to 18 inch diameter tree limb fell onto a house.
ALBEMARLE	6/11/2007	0.75	Upper jet dynamics associated with a 80 to 90 kt jet max combined with surface heating triggered thunderstorms across central and western portions of the piedmont.
ALBEMARLE	6/24/2007	1	Scattered thunderstorms developed in the mountains and foothills during peak diurnal heating and moved east into the western piedmont.
RICHFIELD	3/15/2008	0.75	Penny size hail was reported in Richfield.
NORWOOD	3/15/2008	1	Quarter size hail was reported in Norwood.
LAMBERT	4/20/2008	0.75	Over the course of two day, several shortwave vorticity maxes rotated across the area as a closed upper low spun rotated through the region. Severe thunderstorms developed amidst steepening mid level lapse rates and peak afternoon heating. The severe storms resulted in mainly large hail, ranging from penny to golf ball size hail with an isolated flash flooding.
MILLINGPORT	4/20/2008	1	Quarter size hail was reported near the Lambert community.
NEW LONDON	5/9/2008	0.88	Nickel size hail was reported at 44009 Hearne Road in New London.
MILLINGPORT	5/11/2008	0.75	Penny size hail was reported on Highway 73, two miles west of Plyer.
LOCUST	5/20/2008	1.75	Numerous thunderstorms developed across central North Carolina when a cold front and associated shortwave trough moved through central North Carolina during strong daytime heating. The severe storms produced widespread reports of large hail with only scattered thunderstorm wind damage.
MILLINGPORT	5/20/2008	0.88	Numerous thunderstorms developed across central North Carolina when a cold front and associated shortwave trough moved through central North Carolina during strong daytime heating. The severe storms produced widespread reports of large hail with only scattered thunderstorm wind damage.
ALBEMARLE ARPT	5/20/2008	1.5	Numerous thunderstorms developed across central North Carolina when a cold front and associated shortwave trough moved through central North Carolina during strong daytime heating. The severe storms produced widespread reports of large hail with only scattered thunderstorm wind damage.
NORWOOD	7/8/2008	1	Quarter-size hail was reported along a stretch of Highway 52 from northwest of Norwood to Price Street.
AQUADALE	7/23/2008	0.75	Pre-frontal convection broke out across central North Carolina early in the day, as a weak cold front approached from the west. Another round of storms developed late in the afternoon and evening with the approach of the upper level trough. There were a few reports of penny-size hail and minor thunderstorm wind damage.
HALLS FERRY JCT	4/10/2009	1.75	A swath of hail was reported ranging from quarter to golf ball size hail starting near Rogers Road and ending near NC Highway 740 and US Highway 52 near New London.
ALBEMARLE ARPT	5/5/2009	0.75	Penny sized hail was reported at the intersection of North Carolina Highway 24 and United States Highway 52.
PORTER	5/5/2009	0.88	Penny sized hail was reported along North Carolina Highways 24/27/73, near Tillery Lake.
ST MARTIN	7/20/2009	1	A cluster of convection developed across central North Carolina as a large upper trough and upper jet translated east across the area. Large severe hail up to the size of golf ball was reported with thunderstorm wind damage responsible for structural damage to area homes in Moore County.
LOCUST	6/15/2010	0.75	Locust Fire Department reported a period of hail up to penny size.

Location	Date	Size (in)	Description
LOCUST	6/15/2010	0.88	Nickel size hail was reported near Locust Elementary School.
ALBEMARLE ARPT	5/11/2015	1	Quarter size hail was reported southwest of Albemarle.
LAMBERT	7/23/2015	1	An area of low pressure tracked along a stalled weak frontal boundary across southern portions of central North Carolina and produced scattered showers and storms. a few of the storms became severe and produced damaging winds and quarter size hail.
COTTONVILLE	5/11/2019	1	A line of showers and thunderstorms developed ahead of a mid level disturbance and associated cold front during the afternoon. A portion of the line across the southwest Piedmont of central North Carolina tracked along a outflow boundary, which helped intensify the line and produce large hail and a tornado in Stanly County.
MILLINGPORT	3/27/2021	0.75	Thunderstorms initially over middle and eastern Tennessee during the morning moved to the east of the Appalachians during the the afternoon, where they intercepted an east/west-oriented quasi-stationary front over central and eastern North Carolina. The storms intensified, while scattered supercells developed immediately preceding them, and tracked all generally eastward along and in the vicinity of the front. Some of the storms become strong to severe and produced large hail up to the size of a golf ball and damaging wind.
Union County			
Union County	6/3/1982	1.75”	
Union County	3/8/1983	1.75	
Union County	6/7/1985	1	
Union County	6/7/1985	1	
Union County	5/25/1986	0.75	
Union County	8/3/1986	0.75	
Union County	4/15/1987	0.88	
Union County	4/16/1987	1.75	
Union County	5/1/1987	1.75	
Union County	6/18/1987	0.75	
Union County	8/29/1987	1.75	
Union County	8/29/1987	1.75	
Union County	5/17/1988	0.75	
Union County	5/17/1988	0.75	
Union County	4/29/1989	1.5	
Union County	4/30/1989	0.75	
Union County	4/30/1989	1.75	
Union County	5/5/1989	2	
Union County	6/5/1989	0.75	
Union County	4/1/1990	1	
Union County	4/1/1990	1	
Union County	5/2/1990	1.25	
Union County	5/21/1990	0.75	
Union County	3/13/1991	0.75	
Union County	7/3/1992	0.75	
Waxhaw	3/24/1993	1	
Houston	4/16/1993	1	
Stallings	8/27/1994	1.75	Golfball sized hail fell in the town of Stallings.

Location	Date	Size (in)	Description
Waxhaw	9/1/1994	1.75	Golfball-size hail reported near Waxhaw in western Union County.
New Salem, Indian Trail	5/1/1995	1.75	Golf ball-size hail at Highway 218 and 205.
Waxhaw	5/19/1995	0.75	
Indian Trail	6/12/1995	1.5	
MINERAL SPG	3/15/1996	0.75	A developing squall line caused large hail in the mountains before moving into South Carolina. As the storm system moved rapidly east it again caused damage in North Carolina - this time in the piedmont around Gastonia. A 30 foot section of the roof was blown off the loading dock at Eastridge Mall. Wind damage was also reported in Bessemer City and large hail fell in Union county.
WAXHAW	3/16/1996	0.75	Large hail fell in a number of locations. From Cleveland county into Lincoln county hail accumulated to a couple of inches in a few places. The hail was smaller around Gaston and Union counties.
WAXHAW	3/29/1997	1.25	Severe thunderstorms caused large hail.
MINERAL SPG, MONROE	7/5/1997	1.75	A cluster of severe thunderstorms developed in the evening southeast of Charlotte. Large hail caused extensive damage to cars in Monroe.
INDIAN TRAIL	7/16/1997	0.75	Severe thunderstorms developed mainly in the foothills of North Carolina during the afternoon. Damaging winds up to 75 mph downed trees and power lines. U.S. Highway 74 in Henderson county was blocked for 2 hours due to a large oak tree that fell across the road. Another large tree in Cleveland county fell onto 2 pickup trucks, totalling them. Three houses were damaged by fallen trees, a car was damaged by a collapsed convenience store canopy and trees blocked roads near Indian Trail. Power outages were scattered across the region, some due to lightning. Up to 4300 people were without power in Union county.
STURDIVANTS	9/10/1997	0.75	A severe thunderstorm blew down power lines and caused large hail.
WEDDINGTON, MONROE	6/10/1998	0.75	A warm front pushing north through western North Carolina helped initiate heavy rain and severe thunderstorms during the morning of the 10th. Many reports of trees down and large hail were received from the western piedmont. A car was blown off the road near Kings Creek. Chicken houses were damaged near Taylorsville allowing ten thousand chickens to run free. Numerous trees were uprooted in Monroe and wind-blown golf ball size hail broke windows and damaged cars. Heavy rain in a short period of time resulted in some urban flooding from the Belmont and Mount Holly areas, to the south side of Charlotte. Numerous roads were flooded and several motorists required rescue in different parts of the city. Lightning severely damaged a church in Millersville, but no damage estimate was available. Several homes were struck by lightning in the Charlotte area, causing extensive damage. In Wingate, one house was severely damaged and two others minorly damaged by lightning. Lastly, a lightning strike in Highlands ignited a fire that burned a large house and its contents, including a Corvette. No damage estimates were given.
WEDDINGTON, MINERAL SPRING	6/24/1998	0.88	Multi-cell thunderstorms again developed in the early evening and moved south across the southern mountains and piedmont. A few became severe and produced large hail up to golf ball size, as well as damaging winds. Wind damage was confined to downed trees and power lines. The hardest hit area was northeast of Brevard where roads were blocked.
MONROE	7/20/1998	0.75	A cluster of severe thunderstorms developed west into Cabarrus county, producing numerous microbursts that downed trees and power lines as they moved slowly south over the course of an hour and fifteen minutes. Especially hard hit was the area from Concord into the southern and eastern portions of the county. The storms eventually moved into Union county and produced dime size hail west of Monroe. Lightning strikes also caused several house fires in Iredell,

Location	Date	Size (in)	Description
			Cabarrus and Union counties until late in the evening. One house in Union county was a total loss.
WINGATE, WAXHAW	5/13/1999	1.75	Scattered thunderstorms developed during the afternoon and evening of the 13th and a few pulsed to severe levels. In Henderson county, golf ball size hail covered Highway 280 and a large tree fell onto a house in Hendersonville, causing significant damage to the house and outdoor furniture. Dime to golf ball size hail was reported in Union county along with a measured wind gust to 85 mph. Quarter size hail was reported late in the evening in Avery county. There was a public report of a sighting of a very weak tornado that appeared to make a brief touchdown, but caused no damage, north of Marion. Due to insufficient data in support of this report, an official tornado event will not be entered.
MARSHVILLE	8/1/1999	1	Clusters of severe thunderstorms rumbled through the southern piedmont of North Carolina during the late afternoon and evening hours. Straight-line winds produced by these storms downed many trees and some power lines. One house in Mt. Ulla was damaged by a downed tree. A citizen near Pineville reported twin gustnadoes separated by 30 seconds, which spun up along the gust front of one of the severe thunderstorms. The wind from the gustnadoes pinned the man against the outside wall of his home, chewed up tree limbs and downed a few trees, and threw a 40-foot section of a tree over his house. A neighbor measured the wind associated with the first gustnado at 70 mph with a hand held anemometer. Large hail and straight-line winds broke windows in Marshville.
MINERAL SPG, MONROE, WAXHAW	4/17/2000	0.75	Thunderstorms erupted in the afternoon and evening across western North Carolina. Several clusters of storms became severe and produced hail ranging in size from dimes to golf balls. The general public in Linville was quoted as saying the hailstorm was the worst ever seen due to the amount that covered the ground. Golf ball size hail dimpled cars in Waxhaw. Some damaging straight-line winds occurred as well with one tree falling on a car in Mecklenburg county and several trees downed in Waxhaw.
WAXHAW, MONROE	5/25/2000	1.25	Two severe thunderstorms affected Union county late in the afternoon and then later on in the evening. Large hail fell in and south of Waxhaw in the afternoon. Quarter size hail was reported west of Monroe and straight-line winds blew down trees and power lines in Waxhaw later in the evening.
INDIAN TRAIL	6/4/2000	1	Quarter size hail fell from a lone severe thunderstorm shortly after midnight.
MONROE	4/1/2001	1.75	
WAXHAW	5/19/2001	0.75	
WEDDINGTON	5/25/2001	0.75	A strong cold front dropped into the region on the 25th, resulting in numerous severe weather reports.
MONROE, INDIAN TRAIL, FAIRVIEW	3/31/2002	0.88	
WEDDINGTON	7/4/2002	0.88	
UNIONVILLE	4/10/2003	0.88	
MONROE	5/15/2003	1	Hail fell near highway 74.
UNIONVILLE	5/25/2003	0.75	
NEW SALEM	5/31/2003	1.75	
STALLINGS	7/13/2003	0.75	
MARSHVILLE	8/5/2004	0.88	
MONROE	4/3/2006	0.75	
STALLINGS	7/2/2006	1.5	
STALLINGS	4/12/2007	1.25	Large hail reported on Stallings Rd and Aurora Bvd in the Stallings area.

Location	Date	Size (in)	Description
WAXHAW	6/12/2007	0.88	Scattered severe storms developed over western North Carolina for a second day in a row. The storms mainly produced large hail.
MINERAL SPG	8/22/2007	1.75	A few severe storms affected the western Piedmont of North Carolina during the afternoon hours.
NEW SALEM	3/15/2008	0.88	Severe storms affected the far southern Piedmont of North Carolina during the late afternoon hours.
WAXHAW	6/1/2008	0.75	Large hail affected the western Piedmont of North Carolina with an isolated severe thunderstorm.
MONROE	6/10/2008	0.75	Reported on highway 200.
WAXHAW	6/11/2008	0.88	Hail reported near the intersection of Nesbit Rd and highway 200.
UNIONVILLE, WAXHAW, FAIRVIEW	6/11/2008	1	Scattered severe storms affected western North Carolina during the evening hours.
WAXHAW, MONROE	7/8/2008	0.88	Several severe storms affected western North Carolina during the afternoon and evening hours.
MARVIN	7/23/2008	0.88	Scattered severe storms developed during the evening hours over western North Carolina.
MONROE	8/2/2008	1.75	A cold front triggered several severe storms over western North Carolina during the afternoon and evening hours.
MINERAL SPRING	2/18/2009	0.75	A small cluster of thunderstorms produced isolated large hail over the western North Carolina Piedmont.
WINGATE	6/10/2009	0.88	Several clusters of thunderstorms produced areas of severe weather over parts of western North Carolina during the afternoon and evening hours. Some flash flooding was also observed over the region.
WAXHAW	4/27/2010	0.75	Dime size hail was reported along Maggie Robinson Rd.
MONROE	6/15/2010	1	Thunderstorms erupted in the lee trough over the North Carolina foothills during the early afternoon hours. The storms produced areas of damaging straight-line winds and large hail over much of the foothills and western piedmont.
INDIAN TRAIL, MARSHVILLE	7/13/2010	0.88	A couple thunderstorms developed a little ahead of a cold front over western North Carolina during the afternoon hours. A long lived multicell severe storm produced most of the severe weather. The storm exhibited supercell characteristics for short periods of time, during which it produced two brief tornadoes.
WAXHAW, ALTON, INDIAN TRAIL, WESLEY CHAPEL, MINERAL SPRING	4/9/2011	1.75	Thunderstorms initiated over the mountains of North Carolina during the afternoon hours. As the afternoon progressed, several supercell thunderstorms developed which tracked southeast across the foothills and piedmont along a slow-moving surface cold front. With unusually steep lapse rates over the region, several of the storms produced large hail. Fortunately, the supercells were a little elevated in nature, and only one, brief, weak tornado developed. Still, hail ranging up to the size of a softballs did quite a bit of damage over the region.
WINGATE	5/13/2011	1	Penny to quarter size hail was reported at Wingate University.
SHALETON	9/5/2011	1	Quarter size hail fell at Sardis Church Rd and Unionville-Indian Trail Rd.
WAXHAW	4/26/2012	1	Thunderstorms developed during the afternoon along an outflow boundary from an MCS that crossed the region earlier in the day. The afternoon and evening storms produced large hail and some straight-line wind damage.
MINERAL SPRING	5/14/2012	1.75	Numerous reports of quarter to golf ball size hail were received from near Mineral Springs to the northwest side of Monroe. The largest hail reported fell near Mineral Springs.
WAXHAW ARPT	7/1/2012	1.75	Golf ball size hail was reported near the intersection of Nesbit Rd and Potter Rd S.

Location	Date	Size (in)	Description
ALTON	7/5/2012	1	Quarter size hail fell on Bruce Thomas Rd near Stack Rd.
UNIONVILLE	7/9/2012	0.88	Scattered thunderstorms developed along a southward moving cold front during the afternoon hours. A few of the thunderstorms caused wind damage and dropped large hail.
FAIRFIELD	8/2/2012	1.75	Half dollar to golf ball size hail fell over northeast Union County.
FAIRVIEW, STALLINGS	6/13/2013	1	A line of thunderstorms developed over eastern Tennessee ahead of a cold front. The line pushed east across the mountains and then across the foothills and piedmont during the afternoon and early evening hours. The line formed in an airmass characterized by high instability and moderate wind shear, and several of the storms produced areas of straight-line wind damage and one rare tornado in the North Carolina Mountains. The storms also produced large hail over the foothills and piedmont.
UNIONVILLE	6/13/2013	1.75	Golf ball size hail was reported near Unionville.
WAXHAW	5/23/2014	1.75	Public reported golf ball size hail near Waxhaw.
STALLINGS	5/29/2014	1	Public reported quarter size hail.
ALTON	6/21/2014	1	Spotter reported quarter size hail.
WINGATE	5/2/2016	1	Public reported quarter size hail via Social Media.
INDIAN TRAIL	5/3/2016	1	Public reported quarter size hail at Porter Ridge Middle School.
MONROE	7/23/2017	1	Spotter reported quarter size hail south of Monroe.
INDIAN TRAIL	9/13/2019	1	Public reported brief quarter sized hail.
WAXHAW ARPT	6/28/2020	0.75	Public reported penny size hail.
WAXHAW ARPT	6/3/2022	0.75	Public reported 3/4 inch hail on Dapple Ridge Rd.
WAXHAW ARPT	6/17/2022	1.25	Public reported half dollar size hail on Brady Rd.
WESLEY CHAPEL	9/7/2023	1	Public reported quarter size hail in the Weddington area.
WESLEY CHAPEL	9/7/2023	0.88	Public reported nickel size hail.
ALLEN XRDS	5/10/2024	0.75	Spotter reported 3/4 inch hail.
INDIAN TRAIL	5/15/2024	0.75	Public reported 3/4 inch hail.
HOUSTON	5/15/2024	1	Public reported quarter size hail in the Mineral Springs area.

TABLE H.6: HEAVY RAIN

Location	Date	Description
Cabarrus County		
CONCORD	7/18/2003	Minor flooding of urban areas and some roads developed.
HARRISBURG	8/5/2006	Heavy rain from thunderstorms caused flooding due to poor drainage at the intersection of Hudspeth and Morehead Roads, prompting brief closure of the intersection. Also, the Rocky River briefly flooded a low spot on Pharr Mill Rd. Standing water was reported on numerous roads in the city.
CABARRUS	1/6/2009	Water from Clarke Creek briefly overflowed a bridge on Cox Mill Rd.
WEST CONCORD	8/19/2015	FD reported water flooded the basement of a home on Saddlewood Circle after about 2 inches of rain fell in a short period of time. The flooding was described as being the result of poor drainage.
Stanly County		
ALBEMARLE	2/3/1998	Heavy rain spread across central North Carolina during the evening of February 3rd and it continued until the afternoon of the 4th. Storm total rainfall amounts of 2 to 3 inches were common. Raleigh/Durham recorded 2.5 inches, Goldsboro recorded 2.25 inches, Fayetteville received 2.7 inches, and Rocky Mount had nearly 3.0 inches. There were widespread reports of flooding in low-lying, urban, and normally problematic areas. Several roads had to be closed for brief periods of time with the most numerous road closures in Sampson, Warren, Vance, Granville, Halifax, Scotland, Lee and Durham counties. No one was injured during this event.
ALBEMARLE	11/22/2006	Numerous secondary road closures and HWY 52N baricaded due to flood waters.
OAKBORO	11/22/2006	Water rescue on Hartswell Road. Driver in vehicle clung to tree for 50 minutes before rescue. Left vehicle before it was swept away.
Union County		
	4/30/1996	Thunderstorms produced heavy rain which caused some local flooding in and around Charlotte.
	4/30/1996	Thunderstroms produced heavy rain which caused some local flooding in and around charlotte.
NEAR CHARLOTTE	4/30/1996	Thunderstorms produced heavy rain which caused some local flooding in and around Charlotte.
INDIAN TRAIL	6/16/2001	Heavy rainfall, up to 2.1 inches, in a short time caused a sewer system to overflow into the South Fork Crooked Creek. About 3600 gallons of raw sewage were spilled.
FAIRVIEW	8/16/2003	Several trees were uprooted and a well house was damaged in Fairview. Minor flooding occurred on a few roads in urban portions of Fairview and New Salem.
MONROE	6/23/2004	Heavy rain caused a couple of roads to flood due to poor drainage.
MONROE	11/21/2006	Water was reported over roads in flood-prone and low lying areas during the evening. Affected roads included Secrest, Hopewell Church, and Lawyers Rd.
MINERAL SPG	9/13/2014	County comms reported up to two feet of water standing on the road near the intersection of McWhorter Rd and Potter Rd S due to poor drainage after a couple of inches of rain fell in a short period of time.

TABLE H.7: HEAVY SNOW EVENTS

Date	Location
	Cabarrus County
1/18/2000	Low pressure moved east across Tennessee and weakened as it ran into a surface high pressure ridge along the East Coast. Nevertheless, enough moisture was available to cause heavy snow to fall from Avery county, east across the northern foothills and northwest piedmont. Precipitation began as light rain in the mid-evening hours on the 17th, but quickly turned to snow as the atmosphere cooled to below freezing. Snowfall ranged between 3 and 6 inches across the area by noon on the 18th, with a narrow band of 1 to 3-inch accumulation of snow and sleet to the immediate south.
1/22/2000	A cold dome of arctic high pressure centered over the Mid-Atlantic States provided very cold and dry air to western North Carolina. Meanwhile, weak low pressure moved east along a frontal boundary stalled across the Gulf Coast States to the Georgia coast. Abundant moisture flowed north into the sub-freezing air over western North Carolina, resulting in light snow as early as the afternoon on the 22nd. Snow became heavy by mid-afternoon across the mountains and by evening across the foothills and piedmont. A general 4 to 7-inch snowfall occurred in the mountains with as much as 10 inches reported in Jackson county. Generally, 4 to 6 inches of snow fell across the foothills and piedmont, with a local maximum of 7 inches in western Lincoln county. Rowan county failed to meet heavy snow criteria with accumulations of up to 3 inches. Freezing rain and sleet mixed with the snow for a short time before the precipitation ended, and for the most part, caused little additional problems. The one exception was across southern Union county where freezing rain lasted all night and through much of the morning on the 23rd. Ice accumulations reached damaging levels there around 3 am, causing a large number of trees and power lines to fall throughout the morning. This in turn, resulted in widespread power outages.
1/24/2000	Low pressure rapidly deepened near the Carolina coast, wrapping abundant moisture back across the piedmont of the Carolinas. Snow fell all day and into the night, heavy at times south and east of Interstate 85. By the time snow ended, accumulations ranged from a trace to 4 inches to the immediate north and west of Interstate 85, to 4 to 8 inches from eastern Rowan county to Charlotte and Gastonia, and 10 to 14 inches across southeastern Mecklenburg county and all of Union county. Utility damage in Union county alone was above $4 million, with damage in Monroe at more than $1 million. This storm followed no more than 36 hours after the area received several inches of snow and ice from a previous storm over the weekend.
11/19/2000	Light to moderate snow started in the mountains and spread southeast, lasting through the day. Generally, 1 to 3 inches of snow fell, but some higher elevations of the central and southern mountains reported more than 4 inches.
1/3/2002	Flurries and light snow began in the early evening and became moderate to heavy by late evening on the 2nd. Heavy snowfall accumulations were reached across this portion of the foothills and piedmont overnight on the 3rd, with 4 to 6 inches observed by noon.
1/23/2003	Light snow began around midnight in the southwest piedmont of North Carolina. A burst of heavy snow during the pre-dawn hours resulted in total accumulations of 3 to 8 inches by mid-morning.
2/26/2004	Heavy snow began to fall across the foothills, piedmont, and northern mountains of North Carolina during the late morning. Although snowfall intensity decreased dramatically during the early-to-middle portion of the afternoon, heavy snow redeveloped during the late afternoon, and continued into the evening and overnight hours. Scattered thunderstorms contributed to intense snowfall rates of 2 to 3 inches per hour from time to time, especially in the piedmont, where total snowfall of 12-22 inches occurred. The heaviest amounts occurred in the southwest piedmont, particularly in southern portions of Charlotte metro. Thousands of people were stranded on I-77 during the early afternoon, and some required rescue. The weight of the snowfall caused damage to numerous roofs, while some roofs completely collapsed. Across the foothills and northern mountains, accumulations were considerably lighter, generally in the 4-8-inch range, although amounts of 10-16 inches fell along the Blue Ridge north of I-40.

1/20/2009	Snow developed during the pre-dawn hours across the Piedmont. As snow continued to fall across the Piedmont, heavy snowfall amounts were reached across Cabarrus and Union Counties shortly before the snow completely tapered off. Accumulations ranged from 2-4 inches across the area, although a few higher amounts were reported in eastern portions of these counties.
3/1/2009	Rain changed to snow during the early evening across portions of the foothills and the western Piedmont of North Carolina. Snow became heavy at times throughout the evening, and up to 4 inches had accumulated across the area by 10 pm. Snow, heavy at times and accompanied by occasional lightning, continued into the late evening and early overnight hours. By the time the snow tapered off, accumulations of 3-6 inches were common across the area. However, localized amounts of up to 9 inches were reported, especially along a corridor extending from Shelby to Hickory. The heavy wet snow caused quite a few trees and power lines to fall, resulting in numerous power outages. Some structures received minor to moderate roof damage due to the weight of the snow. Some customers were without power for several days. A tree fell on the library in Belmont, NC, causing damage to the roof. Numerous traffic accidents also occurred.
12/25/2010	A developing coastal storm brought a mix of light rain and snow to portions of the piedmont of western North Carolina during Christmas afternoon. By early evening, precipitation had changed to all snow in most areas northwest of Charlotte, and by late evening, these areas had experienced a rare white Christmas. Shortly after midnight, the precipitation had changed to all snow in the Charlotte metro area. Snow continued to fall steadily overnight, with areas northwest of Charlotte reporting heavy snowfall totals by midnight, with heavy totals not reached until shortly before sunrise along the I-85 corridor. Total accumulations ranged from 2 to 5 inches across the area by the time the snow tapered off to flurries and light snow showers later in the morning.
1/10/2011	Moderate to heavy snow associated with a Gulf Coast storm system spread northward across the foothills and western piedmont of North Carolina during the early morning hours. The heavy snow accumulated quickly, and by sunrise parts of the southwest foothills and piedmont had received 4 inches of snow. The snow was lighter across the northern most foothills and piedmont, where only an inch or two of snow had fallen by mid-morning. The snow became lighter during the day, but continued to accumulate. By early afternoon, snowfall totals ranged from around 7 inches over the southern foothill and southwest piedmont locations, to around 3 inches over the northern most parts of the foothills and piedmont. During the afternoon, precipitation changed to light to moderate freezing rain, which continued into the evening hours. This added as much as a tenth to a quarter inch of ice to the heavy snowfall totals, resulting in sporadic power outages, particularly in the Charlotte metro area. Persistent cold air resulted in only gradual improvement in road conditions, with some businesses and schools remaining closed for several days.
1/17/2018	As a strengthening upper level disturbance and associated cold front approached the region from the Tennessee Valley, light precipitation developed across portions of the Piedmont and foothills of North Carolina during the early morning hours. While the precipitation started as rain or a rain/snow mix in most areas, a transition to snow had occurred in most locations by sunrise. As the snow band moved east throughout the morning, snowfall rates increased, with heavy snowfall accumulations reported by early afternoon. By the time the snow tapered off to flurries, total accumulation ranged from 3 to 6 inches across much of the area.
Stanly County	
1/19/1998	A soaking rain developed across central North Carolina during the overnight hours and gradually changed to snow. Two bands of heavy snow fell. The first band extended from Ansonville of the southern Piedmont northeast through Troy, Southern Pines, Pinehurst, and to Sanford. The second band stretched from Raleigh east through Zebulon, Bailey, Wilson, and Tarboro. Accumulations were in the 2 to 4 inch range with the most accumulations on grassy surfaces and in the trees. Warm ground temperatures, rain soaked ground, and air temperatures in the mid-30s throughout the storm limited snowfall totals significantly.
11/19/2000	An early season snowfall affected portions of central North Carolina on Sunday, November 19. It was the second earliest date that snow has been measured at Raleigh-Durham Airport and at the Piedmont Triad Airport. Rain began to fall in the late morning hours, then changed to a mixture of

	rain, sleet, and snow before ending in the evening. The snowfall was heavy at times in some locations, and up to three inches was recorded. Most locations in central North Carolina received around 2 inches of snow on grassy surfaces. The snow and ice created hazardous driving conditions, leading to numerous accidents.
Union County	
1/18/2000	Low pressure moved east across Tennessee and weakened as it ran into a surface high pressure ridge along the East Coast. Nevertheless, enough moisture was available to cause heavy snow to fall from Avery county, east across the northern foothills and northwest piedmont. Precipitation began as light rain in the mid-evening hours on the 17th, but quickly turned to snow as the atmosphere cooled to below freezing. Snowfall ranged between 3 and 6 inches across the area by noon on the 18th, with a narrow band of 1 to 3-inch accumulation of snow and sleet to the immediate south.
1/22/2000	A cold dome of arctic high pressure centered over the Mid-Atlantic States provided very cold and dry air to western North Carolina. Meanwhile, weak low pressure moved east along a frontal boundary stalled across the Gulf Coast States to the Georgia coast. Abundant moisture flowed north into the sub-freezing air over western North Carolina, resulting in light snow as early as the afternoon on the 22nd. Snow became heavy by mid-afternoon across the mountains and by evening across the foothills and piedmont. A general 4 to 7-inch snowfall occurred in the mountains with as much as 10 inches reported in Jackson county. Generally, 4 to 6 inches of snow fell across the foothills and piedmont, with a local maximum of 7 inches in western Lincoln county. Rowan county failed to meet heavy snow criteria with accumulations of up to 3 inches. Freezing rain and sleet mixed with the snow for a short time before the precipitation ended, and for the most part, caused little additional problems. The one exception was across southern Union county where freezing rain lasted all night and through much of the morning on the 23rd. Ice accumulations reached damaging levels there around 3 am, causing a large number of trees and power lines to fall throughout the morning. This in turn, resulted in widespread power outages.
1/24/2000	Low pressure rapidly deepened near the Carolina coast, wrapping abundant moisture back across the piedmont of the Carolinas. Snow fell all day and into the night, heavy at times south and east of Interstate 85. By the time snow ended, accumulations ranged from a trace to 4 inches to the immediate north and west of Interstate 85, to 4 to 8 inches from eastern Rowan county to Charlotte and Gastonia, and 10 to 14 inches across southeastern Mecklenburg county and all of Union county. Utility damage in Union county alone was above $4 million, with damage in Monroe at more than $1 million. This storm followed no more than 36 hours after the area received several inches of snow and ice from a previous storm over the weekend.
11/19/2000	Light to moderate snow started in the mountains and spread southeast, lasting through the day. Generally, 1 to 3 inches of snow fell, but some higher elevations of the central and southern mountains reported more than 4 inches.
1/2/2002	Heavy snow started falling early in the evening and reached heavy snowfall accumulation status between 8 pm and midnight in this part of the piedmont. Accumulation totals reached 6 to 10 inches between Waxhaw and Monroe.
1/23/2003	Light snow began around midnight in the southwest piedmont of North Carolina. A burst of heavy snow during the pre-dawn hours resulted in total accumulations of 3 to 8 inches by mid-morning.
2/26/2004	Heavy snow began to fall across the foothills, piedmont, and northern mountains of North Carolina during the late morning. Although snowfall intensity decreased dramatically during the early-to-middle portion of the afternoon, heavy snow redeveloped during the late afternoon, and continued into the evening and overnight hours. Scattered thunderstorms contributed to intense snowfall rates of 2 to 3 inches per hour from time to time, especially in the piedmont, where total snowfall of 12-22 inches occurred. The heaviest amounts occurred in the southwest piedmont, particularly in southern portions of Charlotte metro. Thousands of people were stranded on I-77 during the early afternoon, and some required rescue. The weight of the snowfall caused damage to numerous roofs, while some roofs completely collapsed. Across the foothills and northern

	mountains, accumulations were considerably lighter, generally in the 4-8-inch range, although amounts of 10-16 inches fell along the Blue Ridge north of I-40.
1/20/2009	Snow developed during the pre-dawn hours across the Piedmont. As snow continued to fall across the Piedmont, heavy snowfall amounts were reached across Cabarrus and Union Counties shortly before the snow completely tapered off. Accumulations ranged from 2-4 inches across the area, although a few higher amounts were reported in eastern portions of these counties.
3/1/2009	Rain changed to snow during the early evening across portions of the foothills and the western Piedmont of North Carolina. Snow became heavy at times throughout the evening, and up to 4 inches had accumulated across the area by 10 pm. Snow, heavy at times and accompanied by occasional lightning, continued into the late evening and early overnight hours. By the time the snow tapered off, accumulations of 3-6 inches were common across the area. However, localized amounts of up to 9 inches were reported, especially along a corridor extending from Shelby to Hickory. The heavy wet snow caused quite a few trees and power lines to fall, resulting in numerous power outages. Some structures received minor to moderate roof damage due to the weight of the snow. Some customers were without power for several days. A tree fell on the library in Belmont, NC, causing damage to the roof. Numerous traffic accidents also occurred.
12/25/2010	A developing coastal storm brought a mix of light rain and snow to portions of the piedmont of western North Carolina during Christmas afternoon. By early evening, precipitation had changed to all snow in most areas northwest of Charlotte, and by late evening, these areas had experienced a rare white Christmas. Shortly after midnight, the precipitation had changed to all snow in the Charlotte metro area. Snow continued to fall steadily overnight, with areas northwest of Charlotte reporting heavy snowfall totals by midnight, with heavy totals not reached until shortly before sunrise along the I-85 corridor. Total accumulations ranged from 2 to 5 inches across the area by the time the snow tapered off to flurries and light snow showers later in the morning.
1/10/2011	Moderate to heavy snow associated with a Gulf Coast storm system spread northward across the foothills and western piedmont of North Carolina during the early morning hours. The heavy snow accumulated quickly, and by sunrise parts of the southwest foothills and piedmont had received 4 inches of snow. The snow was lighter across the northern most foothills and piedmont, where only an inch or two of snow had fallen by mid-morning. The snow became lighter during the day, but continued to accumulate. By early afternoon, snowfall totals ranged from around 7 inches over the southern foothill and southwest piedmont locations, to around 3 inches over the northern most parts of the foothills and piedmont. During the afternoon, precipitation changed to light to moderate freezing rain, which continued into the evening hours. This added as much as a tenth to a quarter inch of ice to the heavy snowfall totals, resulting in sporadic power outages, particularly in the Charlotte metro area. Persistent cold air resulted in only gradual improvement in road conditions, with some businesses and schools remaining closed for several days.
1/17/2018	As a strengthening upper level disturbance and associated cold front approached the region from the Tennessee Valley, light precipitation developed across portions of the Piedmont and foothills of North Carolina during the early morning hours. While the precipitation started as rain or a rain/snow mix in most areas, a transition to snow had occurred in most locations by sunrise. As the snow band moved east throughout the morning, snowfall rates increased, with heavy snowfall accumulations reported by early afternoon. By the time the snow tapered off to flurries, total accumulation ranged from 3 to 6 inches across much of the area.

TABLE H.8: HIGH WIND EVENTS

Date	Description
Cabarrus County	
1/19/1996	An extremely strong cold front, preceded by heavy rain all day, moved through the mountains, foothills, and piedmont during the night. High winds affected the mountains first and then the foothills and piedmont as the front swept through. Prefrontal southeast winds were extremely high in the mountains with Flat Top mountain reporting gusts to 72 knots during the early evening. This was the highest wind in 20 years of record. Numerous trees and power lines were blown down in western North Carolina with a large number of power outages as a result. The gradient wind caused considerable damage in the foothills and piedmont as the front moved through.
9/6/1996	The fringes of Hurricane Fran caught the Piedmont with high winds especially in the eastern parts of these counties. A number of trees were downed with some power outages as a result. Some of the trees fell on structures. Damage was quite light compared with areas to the east.
2/24/1998	High gradient winds in the wake of an existing strong storm system combining with saturated soil conditions to blow down some trees and power lines across the foothills and piedmont.
3/3/1999	High winds, gusting between 50 and 70 mph, occurred just ahead of a strong cold front. The winds were mostly gradient, but convectively boosted in some cases. Most of the damage occurred in the piedmont where mobile homes and other structures were damaged. Numerous trees and power lines were downed as well.
3/28/2000	High winds following a cold front caused a number of problems during the afternoon. Numerous trees and power lines were downed and some light structural damage occurred. Several thousand people were without power for a while too. A man was injured when a wall toppled over onto him in Concord. Streets were blocked by the downed trees and power lines in Charlotte.
2/16/2001	A strong cold front crossed the region on the 16th, accompanied by gusty winds. Persistent high gradient winds following the frontal passage resulted in downed trees and power lines. Some of the resulting power outages were long-lived, and there was even some structural damage reported.
2/4/2002	High winds, mostly in the form of gusts rather than sustained winds, blew down a number of trees and some power lines during the afternoon and early evening. A number of brush fires were reported around the Charlotte metro area. Some trees blocked roads and some fell on structures. In Statesville, a limb fell on a power line, which in turn caused a house fire. In Cleveland, a sign was blown out of a fast food restaurant. In Rowan, a roof was blown off of an abandoned mobile home.
3/7/2004	As the cold front moved into the piedmont, wind damage continued and became more severe. Numerous trees and power lines were blown down, while roofs were torn off of some buildings. Some outbuildings and barns were damaged or destroyed. In Mecklenburg County, an 81-year-old man was killed in Huntersville, when a tree fell across the deck on which he was standing.
4/16/2007	After an intense, but relatively brief high wind event affected the mountains and foothills on the evening of the 15th, another widespread damaging high wind event developed during the day of the 16th. However, this particular event included much of the piedmont. Thousands of trees fell across the area, resulting in widespread power outages. Numerous trees fell on roads, homes, and vehicles. The Blue Ridge mountains and the foothills received the brunt of the strongest winds. In Highlands, NC, two homes were heavily damaged by fallen trees, while approximately 100 homes received minor to moderate damage. A tree fell on and severely damaged a home in Otto, NC. Two businesses received significant roof damage in Cashiers, NC. Three contruction workers were injured in Mount Holly when an inflatable structure collapsed at a constructions site. Five homes were damaged by fallen trees in Lincoln County, NC alone. Three homes were damaged in Iredell County and in In Catawba County, a 30-foot brick wall on top of a building in Newton was blown down, while sections of a metal roof were torn off a business in Viewmont.

2/10/2008	As the polar vortex dropped into New England, an unusually tight gradient developed over western North Carolina. This gradient, combined with daytime heating, helped to mix down areas of strong winds during the afternoon hours. Numerous trees were reported down across the foothills and western Piedmont, some across roads and on homes. The gusty winds combined with ongoing drought conditions to produce numerous brush fires across the area during the afternoon.
Stanly County	
2/16/1998	Strong winds with gusts to 35 mph were common across central North Carolina during the night of the 16th and into the morning hours of the 17th. The strongest gust was recorded at Goldsboro (52 mph). Several trees were downed in almost all of the counties in central North Carolina from Winston-Salem to Raleigh/Durham to Goldsboro and Rocky Mount. A combination of the wind and very soggy soils led to many of the trees to fall. Several homes were damaged in Sampson, Wayne, Wake, and Cumberland counties.
3/7/2004	High winds just behind a fast-moving cold front produced extensive damage across central North Carolina. In addition to trees and powerlines being blown down, numerous structures sustained damage. A small airplane was blown over at RDU airport, and a portion of Terminal A was damaged. Trailers were turned over and roofs were blown off many buildings. Measured wind gusts were as high as 74 mph. Over 50,000 power outages were reported.
2/10/2010	Numerous trees were blown down countywide blocking many roads and highways. Widespread power outages were caused by the falling trees along with some minor property damage to roofs and small buildings.
Union County	
9/6/1996	The fringes of Hurricane Fran caught the Piedmont with high winds especially in the eastern parts of these counties. A number of trees were downed with some power outages as a result. Some of the trees fell on structures. Damage was quite light compared with areas to the east.
2/24/1998	High gradient winds in the wake of an exiting strong storm system combining with saturated soil conditions to blow down some trees and power lines across the foothills and piedmont. Some trees fell on structures and a steeple was blown off a church in Casar (Cleveland county).
9/15/1999	A tight pressure gradient between powerful Hurricane Floyd across eastern North Carolina and strong high pressure over the Ohio Valley and Great Lakes pulled cooler and very dry air south across the mountains and foothills of North Carolina on strong north winds. Henderson and Transylvania counties were particularly hard hit as winds gusting over 50 mph at times downed numerous trees and power lines - some on homes and vehicles. A person was injured in a car while driving near Zirconia when a tree fell on the vehicle. A large tent providing shelter at a fair in Henderson county was damaged. Numerous brush fires that started were fanned by the high winds. The Asheville Regional airport reported winds sustained at 45 mph with gusts to 54 mph around 9 am EST on the 16th. The wind abated in the mountains around noon. Farther east, especially near and east of Interstate 77, winds more directly associated with Hurricane Floyd caused scattered damage. Winds gusting between 35 and 45 mph downed some trees and power lines. Trees fell on structures in Bessemer City and Gastonia. A warehouse under construction in Lowesville (Lincoln county) was destroyed.
2/4/2002	High winds, mostly in the form of gusts rather than sustained winds, blew down a number of trees and some power lines during the afternoon and early evening. A number of brush fires were reported around the Charlotte metro area. Some trees blocked roads and some fell on structures. In Statesville, a limb fell on a power line, which in turn caused a house fire. In Cleveland, a sign was blown out of a fast food resteraunt. In Rowan, a roof was blown off of an abandoned mobile home.
3/7/2004	As the cold front moved into the piedmont, wind damage continued and became more severe. Numerous trees and power lines were blown down, while roofs were torn off of some buildings. Some outbuildings and barns were damaged or destroyed. In Mecklenburg County, an 81-year-old man was killed in Huntersville, when a tree fell across the deck on which he was standing.

12/10/2008	A localized area of intense winds developed across the Piedmont during the early evening in association with a small area of low pressure. Numerous trees and power lines were blown across the southern part of Union County in North Carolina, with the wind damage extending southward into the northwest Piedmont of South Carolina.
2/24/2016	Very strong west/northwest winds developed across the portions of the northern foothills and western Piedmont during the afternoon in the wake of a cold front. Numerous trees were blown down across the area, some of which fell on and took down power lines, resulting in scattered power outages. Some minor roof damage also occurred, including sections of roof peeled off small businesses in Lowell (Gaston County) and Shelby (Cleveland County) and off a mobile home near Love Valley (Iredell County).

TABLE H.9: ICE STORM EVENTS

Date	Description
Cabarrus County	
2/2/1996	Rain began to freeze in the southern foothills and most of the piedmont. Bridges and overpasses quickly became icy with numerous problems reported on highways and streets. Rain was falling so heavily that not much was accumulating as ice. However, by about noon, ice storm conditions began to develop quickly with numerous power outages reported. Areas west and north of Charlotte were hardest hit. Damage estimates for this major ice storm are a broad estimate and not reliable. Road repair/cleanup costs in North Carolina exceeded $20 million. Numerous traffic accidents caused many injuries and some indirect fatalities.
12/24/1998	Freezing rain accumulated to damaging levels around midnight and by morning there were numerous power outages reported due to downed trees and power lines. Road problems were mostly limited to bridges and overpasses.
1/29/2000	Weakening low pressure in the Ohio River Valley, developing low pressure along the Gulf Coast and cold, arctic air in place across the Carolinas resulted in a wintry mess across western North Carolina. This was the last in a series of 5 winter storms that wreaked havoc on western North Carolina in an 11-day span. The ice storm in the mountains consisted mainly of a couple inches of sleet. However, the combined accumulation of the mixture of sleet and snow was generally 2 to 3 inches. Some freezing rain mixed in during the morning of the 30th. Across the foothills and piedmont, precipitation which briefly began as some light sleet and snow, turned quickly to freezing rain. The freezing rain was heavy enough across the southern piedmont, including the Charlotte area, to result in a 1/4 to 1/2-inch glaze. Scattered power outages resulted, with Gaston county reporting 2500 people without power. The entire Duke Power system reported 77,000 people without power.
12/4/2002	Freezing rain began over the extreme southern mountains of North Carolina during the early afternoon on the 4th, and had spread into the southwest piedmont by midafternoon. Resultant damage due to ice accumulation began during the mid-to-late afternoon. The intensity of the freezing rain increased after midnight, and by sunrise on the 5th, devastating ice accumulations of 1/2 to 1 1/2 inches were observed. The hardest hit area was Charlotte metro. Hundreds of thousands lost power, and the outages lasted for as long as 2 weeks in some areas.
Stanly County	
1/6/1996	
1/11/1996	
2/2/1996	
12/23/1998	An ice storm began during the afternoon of 12/23/98 and continued through the early morning hours on 12/25/98. Most of the precipitation fell in the form of freezing rain across central North Carolina causing power outages to approximately 500,000 people sometime during the period. The most severe ice accumulations were found in a southwest to northeast band across central North Carolina. This band extended from near Albemarle in Stanly county, northeast through the Asheboro area in Randolph county, and continued northeast to Raleigh/Durham and Halifax. Accumulations from 1/2 to 1 inch of ice occurred in these areas. With temperatures in the mid-20s, this made travel conditions nearly impossible on the night of the 23rd.
Union County	
2/2/1996	Rain began to freeze in the southern foothills and most of the piedmont. Bridges and overpasses quickly became icy with numerous problems reported on highways and streets. Rain was falling so heavily that not much was accumulating as ice. However, by about noon, ice storm conditions began to develop quickly with numerous power outages reported. Areas west and north of Charlotte were hardest hit. Damage estimates for this major ice storm are a broad estimate and not reliable. Road repair/cleanup costs in North Carolina exceeded $20 million. Numerous traffic accidents caused many injuries and some indirect fatalities.

2/13/1997	A winter storm brought a variety of weather woes to western and central North Carolina. Snow in the mountains gradually became heavy as it spread east with the highest accumulations in the higher elevations west and north of Asheville. Four to six inches fell with similar amounts in the mountainous parts of the foothill counties. Several inches fell in parts of the piedmont with up to 3 1/2 inches around Cherryville. In the foothills and piedmont, the snow changed to a sleet storm during the afternoon with several inches accumulations. Around Charlotte and Monroe freezing rain during the evening caused scattered power outages.
1/23/2000	A cold dome of arctic high pressure centered over the Mid-Atlantic States provided very cold and dry air to western North Carolina. Meanwhile, weak low pressure moved east along a frontal boundary stalled across the Gulf Coast States to the Georgia coast. Abundant moisture flowed north into the sub-freezing air over western North Carolina, resulting in light snow as early as the afternoon on the 22nd. Snow became heavy by mid-afternoon across the mountains and by evening across the foothills and piedmont. A general 4 to 7-inch snowfall occurred in the mountains with as much as 10 inches reported in Jackson county. Generally, 4 to 6 inches of snow fell across the foothills and piedmont. Freezing rain and sleet mixed with the snow for a short time before the precipitation ended, and for the most part, caused little additional problems. The one exception was across southern Union county where freezing rain lasted all night and through much of the morning on the 23rd. Ice accumulations reached damaging levels there around 3 am, causing a large number of trees and power lines to fall throughout the morning. This in turn, resulted in widespread power outages.
1/29/2000	Weakening low pressure in the Ohio River Valley, developing low pressure along the Gulf Coast and cold, arctic air in place across the Carolinas resulted in a wintry mess across western North Carolina. This was the last in a series of 5 winter storms that wreaked havoc on western North Carolina in an 11-day span. The ice storm in the mountains consisted mainly of a couple inches of sleet. However, the combined accumulation of the mixture of sleet and snow was generally 2 to 3 inches. Some freezing rain mixed in during the morning of the 30th. Across the foothills and piedmont, precipitation which briefly began as some light sleet and snow, turned quickly to freezing rain. The freezing rain was heavy enough across the southern piedmont, including the Charlotte area, to result in a 1/4 to 1/2-inch glaze. Scattered power outages resulted, with Gaston county reporting 2500 people without power. The entire Duke Power system reported 77,000 people without power.
12/4/2002	Freezing rain began over the extreme southern mountains of North Carolina during the early afternoon on the 4th, and had spread into the southwest piedmont by midafternoon. Resultant damage due to ice accumulation began during the mid-to-late afternoon. The intensity of the freezing rain increased after midnight, and by sunrise on the 5th, devastating ice accumulations of 1/2 to 1 1/2 inches were observed. The hardest hit area was Charlotte metro. Hundreds of thousands lost power, and the outages lasted for as long as 2 weeks in some areas.
1/16/2022	Moisture overspread the southern North Carolina Piedmont early on the 16th as strengthening low pressure moved across the Deep South. Precipitation began as rain or a mix of rain and sleet across much of this area shortly after midnight, but with strong northeast winds at the surface supplying ample cold air, while temperatures aloft stayed relatively warm, precipitation transitioned to sleet and then freezing rain across much of this area during the overnight. The freezing rain tapered off during early afternoon, but periods of snow showers developed later in the afternoon into the evening, producing spotty light accumulations. Total ice accretion of one quarter to less than one half inch was reported, along with less than an inch of sleet and snow.

TABLE G.10: LIGHTNING EVENTS

Location	Date	Description
Cabarrus County		
KANNAPOLIS	8/24/1996	
COUNTYWIDE	7/15/1997	Thunderstorms developed in the foothills and western piedmont of North Carolina during the afternoon. A couple became severe producing damaging winds which downed trees in Rowan county and large hail on the east side of Hickory. Persistent lightning in Cabarrus county resulted in countywide power outages for 4 hours.
COUNTYWIDE	7/20/1998	An isolated severe thunderstorm in Waynesville downed numerous limbs and power lines. One thousand people power lost power as well. A cluster of thunderstorms moved from northern Cleveland county, east-southeast and became severe in the eastern portions, downing numerous trees. This cluster of severe thunderstorms moved across Gaston county, continuing to down trees and some power lines and leaving 6500 people without power for a while. The storms then moved into southern Mecklenburg county, blowing down 6 trees on the southwest side of Charlotte. Intense cloud to ground lightning from these storms that became nearly stationary struck 15 dwellings ranging from apartments to condominiums to houses in the Charlotte area. Damage was estimated near 1 million dollars as many homes were destroyed. Flash flooding occurred in South Charlotte late in the evening and continued into the early morning hours. One injured woman had to be rescued from her auto on South Blvd by a firefighter. Another cluster of severe thunderstorms developed west into Cabarrus county, producing numerous microbursts that downed trees and power lines as they moved slowly south over the course of an hour and fifteen minutes. Especially hard hit was the area from Concord into the southern and eastern portions of the county. The storms eventually moved into Union county and produced dime size hail west of Monroe. Lightning strikes also caused several house fires in Iredell, Cabarrus and Union counties until late in the evening. One house in Union county was a total loss.
HARRISBURG	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
HARRISBURG	6/15/2001	LIghtning caused a house fire, resulting in serious damage.
GLASS	8/5/2009	Lightning struck a home on Summit Ridge Ln, causing extensive damage.
KANNAPOLIS	3/30/2012	Lightning struck a vacant home near the intersection of Hilltop Ave and Pine St, starting a fire that destroyed the structure.
ROCKY RIVER	7/1/2012	Lightning started a fire at a home on Thistle Down Dr, heavily damaging the structure.
HARRISBURG	7/26/2016	Media reported a worker at the Charlotte Motor Speedway was injured when lightning struck a fence that he was touching.
Stanly County		
COUNTYWIDE	8/28/1997	LIGHTNING HIT SEVERAL FARM BUILDINGS IN THE COUNTY. MOST OF THE BUILDINGS WERE IN THE LOCUST AND STANFIELD AREAS. AT LEAST THREE OUTBUILDINGS WERE HIT AND DESTROYED.
NORWOOD	6/23/2006	
ALBEMARLE	7/27/2009	Lightning resulted in several house fires from Albemarle to New London. The entire town of Albermarle was without power.
ALBEMARLE	8/19/2010	A lightning strike caused a house fire in Albemarle. Fire fighters was able to contain the fire to the attic.

Union County		
MONROE	4/29/1996	
MONROE	4/29/1996	Morning thunderstorms caused lightning strikes which partially burned two houses.
MONROE	7/30/1996	
MONROE	8/24/1996	Severe thunderstorms swept from the foothills through much of the piedmont causing widespread reports of large hail and damaging wind. Trees were blown down in all locations where wind damage was listed above and in Iredell county a tree crushed a mobile home. Power was out in much of the area. In Charlotte excessive rainfall caused flash flooding. The worst flooding was reported along Independence Avenue where at least one car dealership flooded. Thirty one cars were damaged or destroyed. Lightning caused power outages to 1000 homes around Concord and partially burned a home near Shelby. At Monroe lightning struck two trees, ran through a carport, cracked the wall of a house and injured one woman.
WINGATE	6/10/1998	A warm front pushing north through western North Carolina helped initiate heavy rain and severe thunderstorms during the morning of the 10th. Many reports of trees down and large hail were received from the western piedmont. A car was blown off the road near Kings Creek. Chicken houses were damaged near Taylorsville allowing ten thousand chickens to run free. Numerous trees were uprooted in Monroe and wind blown golf ball size hail broke windows and damaged cars. Heavy rain in a short period of time resulted in some urban flooding from the Belmont and Mount Holly areas, to the south side of Charlotte. Numerous roads were flooded and several motorists required rescue in different parts of the city. Lightning severely damaged a church in Millersville, but no damage estimate was available. Several homes were struck by lightning in the Charlotte area, causing extensive damage. In Wingate, one house was severely damaged and two others minorly damaged by lightning. Lastly, a lightning strike in Highlands ignited a fire that burned a large house and its contents, including a Corvette. No damage estimates were given.
COUNTYWIDE	7/20/1998	An isolated severe thunderstorm in Waynesville downed numerous limbs and power lines. One thousand people power lost power as well. A cluster of thunderstorms moved from northern Cleveland county, east-southeast and became severe in the eastern portions, downing numerous trees. This cluster of severe thunderstorms moved across Gaston county, continuing to down trees and some power lines and leaving 6500 people without power for a while. The storms then moved into southern Mecklenburg county, blowing down 6 trees on the southwest side of Charlotte. Intense cloud to ground lightning from these storms that became nearly stationary struck 15 dwellings ranging from apartments to condominiums to houses in the Charlotte area. Damage was estimated near 1 million dollars as many homes were destroyed. Flash flooding occurred in South Charlotte late in the evening and continued into the early morning hours. One injured woman had to be rescued from her auto on South Blvd by a firefighter. Another cluster of severe thunderstorms developed west into Cabarrus county, producing numerous microbursts that downed trees and power lines as they moved slowly south over the course of an hour and fifteen minutes. Especially hard hit was the area from Concord into the southern and eastern portions of the county. The storms eventually moved into Union county and produced dime size hail west of Monroe. Lightning strikes also caused several house fires in Iredell, Cabarrus and Union counties until late in the evening. One house in Union county was a total loss.
MARSHVILLE	7/29/1999	A severe thunderstorm downed trees in downtown Charlotte in the Charlotte Plaza. A lightning strike in Marshville sparked a blaze which destroyed a house.
MONROE	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown

		down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
MONROE	4/1/2001	Emergency management reported 2 large oak trees down. One tree fell on a horse trailer, the other on a house. The roof was torn off a small building. There was also some structural damage to a separate home, one house fire and one brush fire was started from lightning.
WEDDINGTON	7/29/2003	A person was injured when he was struck by lightning.
WEDDINGTON	8/14/2003	Flash flooding developed first in Indian Trail on the evening of the 14th, and quickly expanded to Weddington and Stallings. Twelve Mile Creek, which is normally 2 feet wide, overflowed its banks and expanded to a width of 50 feet, flooding Forest Lawn Dr. Numerous homes were threatened by flood water, and 16 homes received at least minor water damage. Some motorists and residents required rescue from their vehicles and homes. Several homes were also struck by lightning.
INDIAN TRAIL	8/16/2003	Two people were struck by lightning.
MONROE	5/23/2004	Lightning ignited some structural fires.
MONROE	7/19/2005	Lightning struck a home, igniting a fire which completely destroyed the structure and its contents.
WEDDINGTON	7/21/2009	Lightning struck a home, igniting a fire that destroyed much of the structure.
MINERAL SPRINGS	8/20/2009	Lightning struck a large home on Pimlico Ln, igniting a fire that caused enough damage to render the home uninhabitable.
MINERAL SPRINGS	4/9/2011	Lightning ignited a fire which damaged much of a home in Mineral Springs.
MONROE	8/2/2012	Lightning struck a tree on Church St, which fell on and damaged two vehciles.

TABLE H.11: SLEET EVENTS

Date	Description
Cabarrus County	
12/23/1998	Freezing rain and sleet developed early Wednesday morning and persisted through the morning of Christmas Eve. These areas would receive enough glaze by Christmas Eve morning to cause damage.
3/9/1999	Light snow and sleet fell during the morning, associated with a strong low-pressure area moving north through the Mississippi River Valley. Accumulations by noon ranged between 1 and 3 inches. Some light freezing rain mixed in from time to time as well.
2/16/2003	A light freezing rain developed over the piedmont and foothills of North Carolina during the early morning hours. By mid-morning, the precipitation began to intensify, and a transition to sleet occurred. The sleet accumulated rapidly to a depth of 1 inch in most locations, while periods of afternoon, evening, and overnight sleet increased total accumulations to around 2 inches in most areas. Numerous traffic accidents and road closures resulted.
1/25/2004	During the early afternoon, snow began to mix with sleet across the foothills and northern piedmont, before becoming all sleet later in the evening. In the southern piedmont, precipitation fell almost exclusively as sleet. Total sleet accumulations were generally between 1 and 2 inches across the area. A light freezing rain developed during the evening, which resulted in a thin glaze of ice on top of the layer of sleet. Very slick roads were responsible for hundreds of traffic accidents, some of which involved injuries and fatalities. Numerous injuries also occurred due to falls.
Union County	
12/23/1998	Freezing rain and some sleet developed early Wednesday morning and persisted through the morning of Christmas Eve. Some areas later received enough glaze to cause damage.
2/16/2003	A light freezing rain developed over the piedmont and foothills of North Carolina during the early morning hours. By mid-morning, the precipitation began to intensify, and a transition to sleet occurred. The sleet accumulated rapidly to a depth of 1 inch in most locations, while periods of afternoon, evening, and overnight sleet increased total accumulations to around 2 inches in most areas. Numerous traffic accidents and road closures resulted.
1/25/2004	During the early afternoon, snow began to mix with sleet across the foothills and northern piedmont, before becoming all sleet later in the evening. In the southern piedmont, precipitation fell almost exclusively as sleet. Total sleet accumulations were generally between 1 and 2 inches across the area. A light freezing rain developed during the evening, which resulted in a thin glaze of ice on top of the layer of sleet. Very slick roads were responsible for hundreds of traffic accidents, some of which involved injuries and fatalaties. Numerous injuries also occurred due to falls.

TABLE H.12: TORNADO EVENTS

Location	Date	Description
Cabarrus County		
CONCORD	5/14/2006	The tornado briefly touched down along Cline School Rd in the Rimer community. Damage was mainly confined to downed trees, although the roof was torn off a barn. Power lines were also blown down in the area.
WEST CONCORD	5/11/2008	A tornado touched down briefly near the intersection of highway 49 and highway 601.
WATTS XRDS	12/11/2008	This tornado developed just south of the intersection of Mount Pleasant Rd North and Gold Hill Rd, where part of the roof and southwest side wall of a barn were lifted and tossed 20 to 30 yards. The tornado continued almost due north, roughly paralleling Mount Pleasant Rd, knocking a mobile home 5-10 feet off its foundation on Gold Hill Rd. The tornado continued its intermittent track to the north toward Klutz Rd, where a barn received some minor roof damage and a large hardwood tree snapped off and destroyed a travel trailer. The south side of a barn was torn off and lifted just north of Klutz Rd, with debris scattered up to 100 yards north of the structure. The tornado lifted shortly after this damage occurred. In addition to the structural damage, quite a few trees were snapped off or uprooted along the 2.5 mile track.
HARRISBURG	3/3/2012	This tornado moved into Cabarrus County from Mecklenburg County, south of Harrisburg and west of the Robinson Church Rd and Peach Orchard Rd intersection. The tornado affected several residential areas, damaging around 30 homes and destroying two homes which slid off their foundations. The tornado crossed Robinson Church Rd and Peach Orchard Rd, lifting just short of Hickory Ridge Rd.
GLASS	10/22/2019	Emergency manager reported a brief, weak tornado developed in the Davidson Rd/Sudbury Rd area of Davidson in extreme northwest Cabarrus County. Damage was primarily limited to multiple uprooted trees and at least one snapped tree. Some beehives were also overturned.
MT GILEAD	2/6/2020	NWS storm survey found the damage path of an EF2 tornado that began just west of I-85 near Lane St where trees were snapped and uprooted as the tornado crossed the interstate and moved east along Lane St. The awning of a service station was also damaged. The tornado then moved along Old Salisbury-Concord Rd snapping and uprooting trees until it reached Gold Fish Rd where several homes were damaged. The tornado then moved east along Irish Potato Rd snapping and uprooting trees. Farther along this road another home was damaged. Little damage was noted as the tornado moved east until it crossed Dutch Buffalo Creek where trees were snapped and uprooted. The strongest damage was found just east along Pless Rd where several homes were damaged. The tornado weakened as it moved east snapping and uprooting trees as it went. The tornado ended near Sisk-Carter Rd.
HARRISBURG	5/23/2022	NWS storm survey found that a tornado that began in the Reedy Creek community of Mecklenburg County moved northeast into Cabarrus County just east of I-485 and just north of Rocky River Rd. The tornado continued northeast, crossing Robinson Church Rd, Hickory Ridge Rd, and Stallings Rd before lifting near the intersection of Rocky River Rd and Hearth Lane Southwest. Damage in Cabarrus County was primarily limited to numerous snapped tree limbs and small trees and uprooted larger trees, although minor structural damage was also observed and a vehicle was flipped.
Stanly County		
LOCUST	9/29/1999	A tornado touched down briefly and took the entire roof off a brick ranch. No other damage was noted in the area. A spotter was tracking the funnel.
ALBEMARLE	9/29/1999	A second tornado, spawned by another thunderstorm, dropped a tornado 6 miles west of Albemarle. It destroyed a modular home, then did serious damage to the roof of a church. Several large trees were also taken down in the area. This was near the

		community of Lambert. The tornado then produced sporadic tree and roof damage on its way to the southern part of Albemarle. Several businesses were then heavily damaged, and a lock and store facility was destroyed. The tornado then apparently dissipated.
MILLINGPORT	9/5/2011	The National Weather Service in Raleigh has confirmed that an EF-0 tornado touched down south of the Richfield area in Stanly County. The first touchdown occurred immediately south of Rogers Road where a swath of downed trees and power lines 100 yards across were located. The tornado continued northward tearing the roof off of four wooden outbuildings with metal sheet roofing. Two of the buildings were completely destroyed while the other two were intact despite considerable roof damage. Debris from these buildings was scattered for 200-300 yards in a circular pattern. Debris also included half inch-thick metal fencing that had been twisted and displaced one hundred yards. Many trees were snapped off near their bases. Beyond the outbuildings of the farm, the tornado continued northward, briefly lifting north of Sunnybrook Road. | |Another brief touchdown was noted approximately 3 miles to the north and produced damage to several trees at a residence along NC Highway 49. Touchdown occurred south of Highway 49, continued across the road and lifted near the residence at 22221 Highway 49 just north of the road. No structural damage was found at this location.
COTTONVILLE	5/11/2019	The tornado touched down near Plank Rd, just west of the intersection with Aldridge Rd. Large branches were broken and small trees were snapped on the northern side of Plank Rd. The tornado then moved southeast into the town of Cottonville, where |large trees were uprooted and snapped. At the intersection between Plank Rd and Hardy Rd, the tornado appeared to reach maximum intensity, with numerous trees uprooted and some trees snapped at the trunk. The tornado then continued east along Hardy Road, with minor structural damage noted to farm outbuildings consistent with EF-0 damage. It then lifted and dissipated, as no further significant damage was evident.
MILLINGPORT	2/6/2020	An EF-1 tornado with maximum wind speeds of 110 mph touched down west of Albemarle. A discontinuous damage path started along Flint Ridge Road approximately two miles southwest of Millingport. The damage there consisted of a double-wide manufactured home that had the roof completely removed and shifted off of its foundation. A large storage outbuilding at the same location was completely destroyed. In addition, there was a long and narrow patch of substantial tree damage consisting of both uprooted and snapped hard and softwood trees. This type of damage was noted in numerous locations along Biles Road. The tree damage continued east of Biles Road after crossing Millingport Road. The damage path was picked back up along Pennington Road, where a childcare center had considerable roof damage and numerous surrounding tree damage. A large swath and path of trees damage continued to the northeast, before the damage mostly ended around Snuggs Park Road.
ST MARTIN	5/3/2021	A very brief EF-0 tornado touch down occurred during the afternoon of May 3, 2021, approximately 4 miles northeast of Oakboro in Stanly County, just off of Little Creek Road. Damage consisted of several snapped and uprooted trees, and a chicken house that was completely blown down and blown away. The tornado was confined to a very brief period, or approximately one or two minutes, which corresponds to one volume scan on the Charlotte TCLT radar where a gate-to-gate rotational couplet was noted in conjunction with the primary damage location.
COTTONVILLE	3/31/2022	The tornado tracked from Anson County across the Rocky River into Stanly County near Plank Road. The tornado continued to track northeastward and across mostly rural southern Stanly County before lifting after 3 miles. The tornado caused mostly tree damage and blew a roof of a residents around on Hardy Road near Mount Zion Church Road, shortly before it lifted.
Union County		
Stallings	4/12/1995	Two miles south of Stallings, on Chestnut Road, a small tornado produced significant damage to a barn and a large outbuilding. The roof on a small local business also

		received damage. Numerous trees were blown down. One injury occurred when the wind slammed a door on a resident's hand.
MONROE	4/13/1996	A tornado touched down briefly and caused significant damage to a house, destroyed several outbuildings, damaged a mobile home, and blew down a few trees. The damage was surveyed the next day and convergent rotary wind damage was quite evident. The funnel was observed as it approached the residence.
MONROE	7/4/2001	A “gustnado" formed along a gust front ahead of a line of thunderstorms. The small tornado destroyed a 70 X 70 barn by lifting its roof and carrying it 100 yards and dropping it to the ground. A refrigerator inside the barn had its door removed and a large post
BAKERS	4/16/2011	An area of weak tornado damage began on the north side of Monroe, just west of highway 74 along Williams Rd. Part of the metal roof was blown off a building and some trees were blown down here. The tornado skipped northeast across highway 74 and damaged some outbuildings and blew out the plastic roof covering of an outdoor garden center. The tornado continued northeast, blowing down a few trees as it approached Secrest Shortcut Rd. Part of an outbuilding was destroyed just west of Red Fox Run Rd. The tornado continued over Secrest Hill Dr and Barbee Farm Dr, uprooting pine trees, snapping small trees and causing minor structural damage to homes. As the tornado continued northeast, it may have lifted briefly near Maple Hill Rd before touching down again near the intersection of Ridge Rd and Concord Highway. The metal roof of an outbuilding was tossed about 100 yards and some trees uprooted in a wooded area at this location. The tornado appeared to lift shortly thereafter, just before the intersection of Concord highway and Sikes Mill Rd.
UNIONVILLE	9/5/2011	This brief, weak tornado touched down at a farm site just southwest of the intersection of Ridge Rd and C.J. Thomas Rd. The tornado traveled around one-half mile before lifting near Bernard Thompson Rd. A few barns received roof damage and some trees were blown down.
ALTON	12/28/2015	NWS Storm Survey found the path of a brief, weak tornado that touched down along Jug Broome Rd south of Monroe and moved northeast for less than a mile before lifting along E Sandy Ridge Rd. Five sheds and outbuildings were damaged or destroyed and multiple trees downed. The wall of one home sitting on concrete blocks was shifted about one foot. Additionally, a camper was rolled on its side.
ALTON	5/24/2017	NWS storm survey found a weak tornado tracked northeast from Lancaster County, SC into Union County in a rural area west of South Rocky River Rd. Two walls and much of the roof was blown off a barn off in this area, which was the most significant damage associated with the tornado. Otherwise, damage was primarily confined to numerous downed trees, damage or destruction to multiple outbuildings, and minor structural damage to multiple homes as the tornado tracked northeast, lifting near Joe Collins Rd.
INDIAN TRAIL	2/6/2020	A weakening tornado moved into Union County from Mecklenburg County near Idlewild Rd. Damage in Union County was generally confined to downed weakened and dead trees before the tornado lifted near Hawthorne Drive in Indian Trail.

TABLE H.13: THUNDERSTORM EVENTS

Location	Date	Description
Cabarrus County		
Randolph	7/6/1995	Several reports of trees down.
Stanly	7/6/1995	Trees were knocked down.
Granville	7/6/1995	Trees down on Beltown Road.
Person	7/6/1995	Trees were knocked down.

CONCORD	4/30/1996	An area of severe thunderstorms moved across the Charlotte metro area causing scattered wind damage. A roof was blown off a business in the south part of town and trees and power lines were downed. Trees and power lines were also blown down near Concord and Monroe.
HARRISBURG	5/11/1996	
CONCORD	5/11/1996	Severe thunderstorms moved northeast across the Piedmont. Numerous trees and power lines were downed all along this path. A second swath of damage began along the Rowan/Cabarrus county line. Numerous trees were downed in the Spencer/East Spencer area. A large number of homes were damaged by downed trees and power lines. Sheds were blown away and some light structural damage occurred. In Granite Quarry similar damage was reported with roofs of carports and garages blown off. These damage paths extended to High Rock Lake. Two fatalities were reported on the lake but these were not related to the storm.
CONCORD	5/28/1996	A squall line, plus one or two isolated severe storms, moved from South Carolina into the North Carolina foothills and piedmont. Damage was mostly limited to downed trees and power lines but light structural damage was reported. In northern Mecklenburg county some outbuildings were destroyed and a farm animal killed. Trees fell onto homes near Shelby and power was out for thousands of customers all night.
MIDLAND	6/20/1996	A tree fell during a severe thunderstorm and destroyed a mobile home.
CONCORD	7/15/1996	Severe thunderstorms developed along the foothills and piedmont and became more powerful as they moved east. Trees were blown down in areas listed above and east of Troutman underpinning was blown out from under a mobile home. Roofs of houses, outbuildings and a garage were destroyed by the wind in this same area. Power outages were common. Up to 10,000 customers were without power. Some trees fell on cars and houses.
HARRISBURG	8/3/1996	Thunderstorms produced some flooding in the mountains where several bridges were flooded out. Winds gusts were estimated to 50 knots at Hot Springs by an employee of NCDC. A steady state thunderstorm moved across northern Mecklenburg county leaving quite a bit of damage to homes resulting from downed trees. Wind and hail damage was likely more than the $50,000 listed above. The storm had weakened considerably by the time it reached Harrisburg but was still strong enough to blow down a few trees. Lightning severely damaged a home at Hickory.
MIDLAND	4/27/1999	A backdoor cold front moving southwest across the western piedmont of North Carolina and a warm front moving north across the mountains provided the focus for strong to severe thunderstorm activity during the afternoon and evening. The severe thunderstorms produced mainly large hail ranging in size between dimes and half dollars. However, there was one report of damaging winds which blew down trees late in the evening in Cabarrus county.
KANNAPOLIS	7/24/1999	Clusters of slow-moving thunderstorms developed during the afternoon on another hot and humid summer day. Some of the storms became severe, producing large hail the size of nickels and quarters, and straight-line winds which downed numerous trees. In Kannapolis, the roof of a commercial building was blown off. The Gastonia area experienced a severe thunderstorm which lasted nearly an hour. Numerous trees and power lines were downed, some of which fell on a trailer and homes. Urban flooding in normally flood-prone areas stranded a few cars and lightning strikes caused several house fires. In rural areas around Monroe, small streams briefly came out of their banks and flooded typical flood-prone areas.

HARRISBURG	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
CONCORD	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
MT PLEASANT	9/9/1999	A line of thunderstorms crossed the foothills and piedmont during the afternoon, producing a large amount of lightning, gusty winds and hail. A few storms became severe briefly as they produced dime size hail or damaging wind. A large oak tree was downed across power lines on Sherrills Ford Road west of Salisbury. Another tree was blown down and blocked a lane on Interstate 85 near Spencer. Three trees were downed in the Mt Pleasant vicinity and one house under construction was destroyed when collapsed by the wind. A combination of lightning activity and gusty winds near 50 mph at times caused scattered power outages and trees limbs to fall. These reports came mainly from southern Cleveland county through western Lincoln county and into Catawba county.
MT PLEASANT	9/29/1999	A weak boundary and a favorable shear profile was sufficient to produce 3 supercell thunderstorms in a row which tracked east northeast across the Charlotte metro area and through Cabarrus County. Funnel clouds were observed with 2 of the storms across extreme eastern Cabarrus county. About 4 miles north of where one of the funnel clouds was seen, the severe thunderstorm produced damaging wind which blew down a half dozen trees. Flash flooding developed in the same areas of eastern Cabarrus county due to the repeat thunderstorms. Some roads were washed out and several major intersections were flooded.
MIDLAND	5/19/2001	At least three trees down, one on a power line.
CONCORD	8/18/2001	A few trees and power lines brought down southeast of town, along NC Highway 24/27 and on Reed Mine Road.
MT PLEASANT	4/22/2006	
CONCORD	6/10/2006	Numerous trees down, some on homes and power lines, from the city to the area near Flowes Store Rd and Highway 601.
CONCORD	6/12/2006	Seven power poles blown down along Pitts School Rd. A barn was blown down near the intersection of Shelton and Poplar Tent Rds.
CONCORD	6/12/2006	Large tree limbs down.
HARRISBURG	7/22/2006	Tree down on Robinson Church Rd and a few large limbs down in the area.
KANNAPOLIS	3/4/2008	Several trees and power lines blown down between Kannapolis and Mount Pleasant.
CONCORD	6/22/2008	Trees were blown down.
ROCKY RIVER	6/22/2008	Trees were blown down near the intersection of Stough Rd and highway 49.
CABARRUS	6/28/2008	Trees blown down on Sam Black Rd.

MT PLEASANT	7/8/2008	Numerous trees were blown down in the Mount Pleasant area, with damage being most concentrated in the Mount Olive Rd area.
CONCORD	7/8/2008	A tree was blown down on a house off Virginia St in Concord, which caused significant damage to the roof. Another tree was blown down on Hillindale St.
MT PLEASANT	7/22/2008	Two trees were blown down.
JACKSON PARK	4/5/2011	Multiple trees were blown down from west of Concord, through the city, and across the Mount Pleasant area. One tree fell on a home west of Concord.
NORTH CONCORD	4/28/2011	Two large pine trees were blown down on Southcircle Dr. Another tree was blown onto a home on Kannapolis Highway about 3.5 miles northwest of Concord.
CONCORD	6/11/2011	A few trees were blown down around Concord.
KANNAPOLIS	6/18/2011	Large tree limbs were blown down in the Kannapolis area.
MT PLEASANT	6/18/2011	Public reported large tree limbs blown down in the Mount Pleasant area.
JACKSON PARK	6/21/2011	Multiple trees were blown down on the west side and east side of Concord.
ROBERTA MILLS	8/11/2011	Six aircraft were damaged and at least one tree blown down at Concord Regional Airport. Large tree limbs were also blown down near Concord Mills.
ROBERTA MILLS	9/2/2011	Part of the roof was blown off a warehouse on Lyles Lane. Witnesses in the area reported extreme winds and a small rotary wind that may have been a “gustnado.”
CONCORD	9/2/2011	Multiple trees were blown down on the north and west side of Concord. Several power poles were also snapped along highway 29 south of town.
CONCORD	9/27/2011	Part of a roof was blown off a vacant warehouse in Concord and trees were blown down at McGill Ave and Kerr St.
ROBERTA MILLS	10/19/2011	The FAA reported that wind blew a small helicopter onto its side at the Concord Regional Airport.
KANNAPOLIS	6/22/2012	A few trees were blown down in the Kannapolis area with one tree down on power lines on Southeast Ave.
KANNAPOLIS	7/27/2012	Multiple power lines were blown down across Kannapolis, with at least two of those having been brought down by large tree limbs.
BARRIERS MILL	6/18/2015	FD reported two tree and multiple power lines blown down near Mount Pleasant.
HARRISBURG	6/19/2015	FD reported one tree and multiple large limbs blown down, some onto power lines in the Harrisburg area.
ROBERTA MILLS	6/20/2015	Spotter reported multiple trees down west of Concord. Another spotter reported multiple large trees down near Newport Dr and South Main St in Kannapolis. Public reported parts of roofing peeled off the YMCA building in Kannapolis.
HARRISBURG	6/22/2015	Public reported a tree down just south of the Charlotte Motor Speedway, and another tree down in Harrisburg proper, via social media.
WEST CONCORD	6/22/2015	EM reported dozens of trees and some power lines blown down across the city of Concord. Trees or large limbs fell on homes on Burrage Rd, Queens Rd, Brookwood Ave, McKinnon Ave near Church St, Long Ave, and May St. Two vehicles were also destroyed by falling trees on May St.
CONCORD	8/19/2015	County comms reported a few trees blown down in the Concord area when two severe storms moved over the city within a few minutes of each other.
WEST CONCORD	9/4/2015	County comms reported multiple trees blown down southwest of Concord. Media reported some billboards damaged near Charlotte Motor Speedway.
CABARRUS	4/24/2017	Newspaper reported a combination of gusty winds and saturated soils from more than 48 hours of moderate to heavy rain caused a tree to fall on a home on Bethel Church Rd, resulting in significant damage that made the home uninhabitable.

ROBERTA MILLS	6/13/2017	County comms reported a tree blown down on Blackberry Trail and another tree down on Memory Ln.
HARRISBURG	7/5/2017	FD reported a tree blown down on a car on Sherborne Dr.
CONCORD	9/1/2017	Local law enforcement reported several trees and some power lines blown down in Concord.
WEST CONCORD	5/4/2019	County comms reported several trees blown down on Highway 601 near the intersection of Highway 49.
HARRISBURG	5/11/2019	Law enforcement reported numerous trees blown down along with multiple power lines across southern Cabarrus County.
JACKSON PARK	6/20/2019	County comms reported numerous trees blown down in the Concord area.
JACKSON PARK	7/4/2019	Fire dept reported a tree blown down on power lines on Meadowview Ave SW and at Hoover Ave at Reed St.
WEST CONCORD	10/31/2019	County comms reported a couple of trees blown down.
CONCORD	2/6/2020	Spotter reported multiple trees blown down in the area bound by Highway 3, Old Airport Road, and Highway 73.
GLASS	4/13/2020	Media reported multiple trees blown down on the Cabarrus County side of Kannapolis, with some homes damaged due to fallen trees.
KANNAPOLIS	7/17/2020	County comms reported trees blown down off Brantley Rd and China Grove Rd.
ROCKY RIVER	7/18/2020	County comms reported multiple trees blown down off Zion Church Rd.
MT PLEASANT ARPT	7/18/2020	Public reported the roof blown off a barn and multiple trees blown down on Saint Stephens Rd. County comms reported multiple trees blown down south of Gold Hill in Cabarrus County.
ROBERTA MILLS	7/12/2021	County comms reported a tree blown down on a house on Glen Eagles Ln.
GEORGEVILLE	8/11/2021	Public reported multiple trees blown down with a large limb on a house on Club View Dr.
JACKSON PARK	8/11/2021	County comms reported several trees blown down in the Concord area.
GLASS	8/15/2021	Law enforcement reported multiple trees blown down across Kannapolis.
GLASS	6/1/2022	Trees and utility lines were blown down, with one tree on a house near Wilkinson St.
ROBERTA MILLS	6/14/2022	Public reported two trees blown down and blocking Odell School Rd and additional trees and many large limbs down in the Poplar Tent community.
CONCORD	6/16/2022	Public reported numerous trees and power lines blown down across Cabarrus County, especially the central part of the county.
KANNAPOLIS	7/5/2022	County comms reported several trees blown down in Kannapolis and vicinity.
GEORGEVILLE	7/29/2022	County comms reported multiple trees, power lines, and numerous large tree limbs blown down.
MIDLAND	8/10/2022	Public reported trees blown down in the Midland area.
HARRISBURG	1/12/2023	Public reported (via Social Media) a tree blown down in the Harrisburg area and multiple trees down at Miami Church Rd and Mount Pleasant Rd. Spotter reported a tree down near the intersection of Zion Church Rd and Flowes Store Rd.
MT GILEAD	6/26/2023	Utility company reported multiple trees or large limbs blown down.
KANNAPOLIS	8/6/2023	Ham radio operator reported a tree blown down on a house on Ashbury Ln.
GLASS	8/7/2023	Emergency manager and public reported multiple trees blown down from northwest Cabarrus County through Concord and Harrisburg. One tree fell through the roof of a home on the northwest side of Concord.
HARRISBURG	8/15/2023	County comms reported trees blown down near Roberta Rd and Physicians Blvd and a tree blown down along Mary Circle.

WEST CONCORD	8/24/2023	County comms and law enforcement reported around 20 trees blown down from the south side of Concord to west of Mount Pleasant.
GLASS	8/26/2023	County comms reported multiple trees and power lines blown down on Shiloh Church Rd.
HARRISBURG	8/27/2023	Utility company reported trees blown down on power lines on Rocky River Rd.
KANNAPOLIS	1/9/2024	Public reported (via Social Media) several trees blown down in Kannapolis. Emergency manager reported numerous trees down in Concord and vicinity.
HARRISBURG	4/11/2024	Emergency manager reported numerous trees and power lines blown down from the Harrisburg area, across Concord and points northeast. One tree fell on a structure on Buckingham Ln in Harrisburg.
ROBERTA MILLS	5/8/2024	Public reported a few trees and power lines blown down near the Charlotte Motor Speedway.
RIMER	7/16/2024	Public reported multiple trees blown down near the Rowan County line, including on Irish Potato Rd. Several homes in the area also reported roof damage from a combination of wind and hail.
KANNAPOLIS	8/2/2024	Spotter reported trees blown down onto houses on Pine St and on West C St in Kannapolis.
Stanly County		
	5/13/1995	Trees down on the Montgomery County line and at the edge of the Pee Dee River south of Morrow Mountain State Park.
BADIN	4/30/1996	Strong thunderstorm winds toppled trees and blew down power lines in the Badin area.
ALBEMARLE	7/15/1996	Trees down.
NRN HALF	7/15/1996	Trees down north of Albemarle.
ALBEMARLE	9/29/1999	The same thunderstorm that spawned a tornado in Locust produced a downburst on the out skirts of Albemarle which damaged three mobile homes.
ALBEMARLE	5/22/2001	Six trees were blown down across Gene, Gurley, and Yadkin Brick Roads.
NEW LONDON	4/17/2006	NUMEROUS TREE DOWN ACROSS NORTHERN PORTIONS OF THE COUNTY.
STANFIELD	6/11/2006	Trees down near Love Mill Road and Talley Road.
NORWOOD	6/23/2006	Power lines down.
ALBEMARLE	8/3/2006	Several reports of trees and power lines down on SR-27.
NEW LONDON	8/30/2006	Trees reported down.
NORWOOD	11/16/2006	Trees down near Norwood.
OAKBORO	3/4/2008	Fifteen to twenty trees were blown down. A trailer was also moved 150 FEET by wind speeds estimated at 65 to 70 mph.
ALBEMARLE	3/4/2008	Several trees were reported blown down across Albemarle.
NORWOOD	3/4/2008	Severe winds estimated at 60 to 70 mph blew off an awning off of a gas station.
ST MARTIN	5/20/2008	Straight line winds downed trees onto St Martin Road northeast of Oakboro.
AQUADALE	7/6/2008	Trees were blown down on Highway 138 between Oakdale and Aquadale.
NORWOOD	7/8/2008	Several trees were blown down in the Norwood area.
RICHFIELD	7/8/2008	Several trees were blown down in the Richfield area.
ALBEMARLE ARPT	7/8/2008	One tree was blown down at the intersection of Aquadale and Morgan Roads.
RICHFIELD	7/22/2008	Several trees were blown down near Highway 52 and Old Salisbury Road.
BADIN	7/31/2008	One tree was blown down at the corner of Henderson Street and Valley Drive.
ST MARTIN	8/7/2008	A severe thunderstorm knocked a tree onto a house just northeast of Oakboro.

STANFIELD	4/5/2011	Several trees were blown down along a swath from just west of Stanfield to near Badin.
NORWOOD	6/11/2011	Large tree limbs were blown down across Quail Trail Road.
LOCUST	6/18/2011	Numerous trees were blown down in Locust.
FINGER	6/18/2011	Several trees were blown down in Finger.
NEW LONDON	7/4/2011	Trees and power-lines were blown down, with one down tree on Highway 52 North.
OAKBORO	7/13/2011	Numerous trees were reported down throughout Stanly County.
ALBEMARLE	7/31/2011	Several trees were blown down along the wind swath, including down trees on Lowder Street and NC Highway 205. One tree was also reported down on a home. There was no information available regarding monetary damages.
PALESTINE	8/6/2011	One tree was blown down on Palestine Road.
ALBEMARLE	9/2/2011	A tree was blown down a few miles north of Albemarle on Snuggs Park Road.
LAMBERT	3/3/2012	Two old barns were blown down and one home on Substation Road sustained minor damage.
LOCUST	3/24/2012	Two trees were blown down in Locust.
HALLS FERRY JCT	5/22/2012	One tree was reported down on Old Salisbury Road.
NEW LONDON	5/22/2012	One tree was reported down on Herlocker Road.
NEW LONDON	7/3/2012	Trees were blown down across North Carolina Highway 740 near New London.
ALBEMARLE	7/6/2012	Several trees were reported down across roads and power lines near Albemarle, with one tree reported to have fallen on a home.
PALMERVILLE	7/9/2012	One tree was blown down on power-lines resulting in scattered power outages in New London and Badin.
PALMERVILLE	7/18/2012	Several trees were blown down on Palmerville Road near Badin.
BIG LICK	7/19/2012	A tree downed several power lines on NC 24/27 near Oakboro. Also, several power outages were reported in Albemarle.
RED CROSS	7/27/2012	A couple of trees were blown down along a swath from near Oakboro to near Badin, with one tree falling on a home near Badin. Monetary damages were unknown.
PALMERVILLE	8/8/2012	One tree was reported down onto a house. No other information was available.
ALBEMARLE ARPT	8/8/2012	Power-lines were reported down.
ALBEMARLE	8/17/2012	A couple of trees were blown down just west of the city of Albemarle.
NORWOOD	6/2/2015	One tree was blown down on Piney Point Road in Norwood.
LOCUST	7/20/2015	A tree and several power lines were blown down on Carol Avenue in Locust.
ALBEMARLE	9/4/2015	Numerous trees were blown down along a swath from Old Salisbury Road in North Albemarle to Lakewood Drive in Oakboro.
STANFIELD	4/6/2017	Numerous trees were blown down along a swath from Stanfield to Badin, several of which were blocking roads.
OAKBORO	5/5/2017	Trees were reported down on both lanes of Griffin Green Boulevard.
ALBEMARLE ARPT	5/5/2017	Numerous trees were reported down in Albemarle, focused near Pee Dee Avenue and East Main Street.
ALBEMARLE	5/5/2017	One tree fell onto a home at New Castle Court. The tree crashed through the roof of the house.
OAKBORO	7/5/2017	A couple of trees were blown down on Old Sandbar Road.
ALBEMARLE	7/18/2017	Multiple trees were reported and power lines were reported down in the Albemarle area.

NEW LONDON	7/28/2017	One tree was blown down near the intersection of NC-740 and Woodhurst Road.
ALBEMARLE	4/19/2019	Several trees blown down in the city of Albemarle.
NORWOOD	4/19/2019	Several trees blown down through-out the city.
RICHFIELD	5/4/2019	One tree was reported down on Willie Road at Fontana Drive and another tree down on Willie Road at Spivey Road.
NEW LONDON	6/20/2019	Numerous trees and power lines were reported down in the New London area.
BLOOMINGTON	8/1/2019	Multiple trees were blown down and a roof was blown off a barn near the intersection of Canton Road and Austin Road.
RED CROSS	1/11/2020	Numerous trees and power lines were reported down across western portions of the county.
BLOOMINGTON	1/11/2020	Numerous trees were reported down across the county.
ALBEMARLE	2/6/2020	The goal post at the Albemarle High School was bent from the damaging winds.
ALBEMARLE	2/6/2020	The roof was reported damaged to a business in the 1400 block of United States Highway 52.
PALESTINE	2/6/2020	Several trees were reported snapped off in the vicinity of Mountain Creek Road and Talbert Drive. The roof to a carport was also blown off.
ALBEMARLE	2/6/2020	Several trees were reported down in Albemarle. Some of the trees fell on outbuildings and vehicles causing minor damage.
NORWOOD	2/6/2020	Numerous trees were reported down in and around Norwood.
BIG LICK	5/22/2020	Multiple trees were reported down on Griffin Green Boulevard.
BADIN	5/22/2020	One tree was reported down on Stand Drive.
STANFIELD	5/28/2020	A tree was reported down on a car at the intersection of Robert Drive and North Carolina Highway 200.
BIG LICK	5/28/2020	Trees and power lines were reported down at Big Lick Road and Oak Grove Road.
OAKBORO	6/11/2020	Multiple trees were reported down in Oakboro.
RED CROSS	6/22/2020	Numerous trees were reported down across Stanley County.
OAKBORO	5/3/2021	Trees were reported down and damage to a roof was reported near Hurley Road to Pecan Drive.
OAKBORO	5/3/2021	Numerous trees were reported down from Sun Rise Lane to Hazard Road.
PORTER	5/6/2022	Extensive tree damage was reported around Lake Tillery, including trees on residences. The intersection of one report was Indian Mound Rd and Shore Farm Rd near Norwood.
PLYLER	5/23/2022	State officials report numerous trees down across Stanly County.
COTTONVILLE	5/27/2022	Many trees were reported down around the intersection of Rocky River Springs Rd and Southern Rd in Norwood.
OAKBORO	6/16/2022	Several trees were reported down in the Oakboro area.
OAKBORO	7/20/2022	Multiple trees were reported down near the intersection of South Main St and Aquadale Rd in Oakboro.
AQUADALE	7/20/2022	A tree fell on power lines, causing power outages near the intersection of Ray Bud Rd and Old Aquadale Rd in Aquadale.
LOCUST	8/10/2022	Trees were reported down near the intersection of Market Street and Ray Kennedy Drive.
NEW LONDON	1/12/2023	Trees were reported down on Church Street.
RICHFIELD	6/19/2023	A tree was reported down, blocking the roadway near the 48800 block of High Rock Rd in Richfield.
ALBEMARLE ARPT	7/1/2023	Trees were reported down and roof damage in Albemarle.

ALBEMARLE	8/7/2023	Trees were down all over Stanly County, including one that fell on an apartment building in Albemarle.
RICHFIELD	9/7/2023	One tree was reported down in the Richfield area near the intersection of Moss St and N Main St.
COTTONVILLE	1/9/2024	Trees and powerlines were reported down near the intersection of Whitley Rd and Mt Zion Church Rd.
ALBEMARLE ARPT	1/9/2024	Several trees were reported down in the town of Albemarle.
ST MARTIN	5/8/2024	Widespread trees and powerlines were reported down from the towns of Locust to Albemarle.
NORWOOD	5/15/2024	A tree was reported down, resulting in power lines down near the intersection of Fork Rd and highway 731.
NEW LONDON	8/18/2024	Numerous trees were reported down in the town of New London.
Union County		
Weddington	4/24/1995	Trees down on home on Route 16.
Waxhaw	8/15/1995	Trees down near Waxhaw in SW Union County.
MARSHVILLE	4/20/1996	Severe thunderstorms developed in the western North Carolina mountains and moved east. Trees and power lines were blown down at several locations from Swain County to Union County. Around Maggie Valley and Lake Junaluska a porch was blown off a house and landed on a car. Power was out to about 5700 people in that area. Another area of damage was near the Blue Ridge Parkway where trees and signs were blown down. Around Cashiers a number of trees were downed causing damage to homes and a pickup truck was blown off an embankment. Also shingles were blown off houses and roofs were blown off of some utility buildings. Near Brevard there was a damage swath about 200 yards wide and 3/4 mile long where a mobile home was blown off its foundation. Nine other mobile homes and two houses were damaged by the wind. In Gaston county shingles were blown off homes in a couple of locations, large trees were downed by the wind and a trampoline was blown into power lines. A damaging storm traversed Union county, blowing over a mobile home, destroying a barn and downing a number of large trees. Trees and power lines were downed near Charlotte.
MONROE	4/30/1996	
MONROE	5/29/1996	
MONROE	7/30/1996	A severe thunderstorm blew down trees and power lines from Monroe to the east of town. There were numerous cloud to ground lightning strikes. A restaurant was reported to have burned from one of the strikes.
MARSHVILLE	8/26/1996	A downburst ripped part of the roof off a well-constructed barn causing significant damage. Some swirls in nearby grass suggested a tornado possibly caused the damage but evidence is insufficient and no witnesses observed the storm.
MONROE	1/3/1999	A fast moving low-topped thunderstorm moved through Union county North Carolina along a boundary separating remnants of an arctic airmass and warm moist air from the Atlantic Ocean. The storm became severe, producing a southwest to northeast path of damage across central Union county. Trees were downed and there was damage to a home and picnic table.
WEDDINGTON	3/21/1999	A severe thunderstorm generated damaging winds that blew down fences and injured horses that were loosed from their pasture.
WINGATE	5/13/1999	Scattered thunderstorms developed during the afternoon and evening of the 13th and a few pulsed to severe levels. In Henderson county, golf ball size hail covered Highway 280 and a large tree fell onto a house in Hendersonville, causing significant damage to the house and outdoor furniture. Dime to golf

		ball size hail was reported in Union county along with a measured wind gust to 85 mph. Quarter size hail was reported late in the evening in Avery county. There was a public report of a sighting of a very weak tornado that appeared to make a brief touchdown, but caused no damage, north of Marion. Due to insufficient data in support of this report, an official tornado event will not be entered.
WAXHAW	6/10/1999	Scattered thunderstorms developed in the mountains during the early afternoon. A couple of those storms became severe and downed trees and power lines. A cluster of severe thunderstorms developed in the southern piedmont during the evening and produced damaging straight-line winds which downed trees in many locations. A small mobile home was blown over southwest of Lincolnton. More than one inch of rain fell in a short period of time in Charlotte and caused some urban flooding in which a few cars were involved. However, no serious problems were reported.
WEDDINGTON	7/6/1999	One thunderstorm early in the afternoon became severe and an automated gage at Panthertown measured a wind gust to 58 mph. Downed trees in Weddington caused some property damage, but a dollar amount was not known at the time of the writing.
MONROE	7/24/1999	Clusters of slow-moving thunderstorms developed during the afternoon on another hot and humid summer day. Some of the storms became severe, producing large hail the size of nickels and quarters, and straight-line winds which downed numerous trees. In Kannapolis, the roof of a commercial building was blown off. In rural areas around Monroe, small streams briefly came out of their banks and flooded typical flood-prone areas.
MONROE	7/31/1999	Severe thunderstorms shortly after midnight produced damaging winds and a considerable amount of lightning across the southern piedmont of North Carolina. Scattered trees were downed, some on roads. At a Faith school, a grandstand was blown down and a ticket booth was blown over. Signs were blown away in the town, a screen door was torn off a business and trees were split in half. Downed trees also occurred in nearby Richfield and East Rowan. At the Concord Airport, 25 percent of a hangar's roof was blown off. Lightning strikes across the region caused numerous structure fires.
MONROE	8/1/1999	Clusters of severe thunderstorms rumbled through the southern piedmont of North Carolina during the late afternoon and evening hours. Straight-line winds produced by these storms downed many trees and some power lines. One house in Mt. Ulla was damaged by a downed tree. A citizen near Pineville reported twin gustnadoes separated by 30 seconds, which spun up along the gust front of one of the severe thunderstorms. The wind from the gustnadoes pinned the man against the outside wall of his home, chewed up tree limbs and downed a few trees, and threw a 40-foot section of a tree over his house. A neighbor measured the wind associated with the first gustnado at 70 mph with a hand held anemometer. Large hail and straight-line winds broke windows in Marshville.
WAXHAW	8/1/1999	Clusters of severe thunderstorms rumbled through the southern piedmont of North Carolina during the late afternoon and evening hours. Straight-line winds produced by these storms downed many trees and some power lines. One house in Mt. Ulla was damaged by a downed tree. A citizen near Pineville reported twin gustnadoes separated by 30 seconds, which spun up along the gust front of one of the severe thunderstorms. The wind from the gustnadoes pinned the man against the outside wall of his home, chewed up tree limbs and downed a few trees, and threw a 40-foot section of a tree over his house. A neighbor measured the wind associated with the first gustnado at 70 mph

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MONROE	8/14/1999	Isolated severe thunderstorms brought damaging wind and large hail to a few locations in the northwest and southern piedmont of North Carolina. Just north of Conover, it hailed for 15 minutes, with the largest hail falling near the end and badly denting a car. Ten trees were blown down in southeast Union county. Trees were also blown down in Rowan county including 2 large trees which fell on a mobile home in the town of Cleveland.
INDIAN TRAIL	4/1/2001	911 center reported trees down and wind estimated to 65 mph. A storm spotter nearby recorded an actual measured gust of 60 mph.
MONROE	4/1/2001	911 center reported trees down.
MONROE	4/1/2001	
MARSHVILLE	4/1/2001	911 center reported trees down and wind estimated at 65 mph.
INDIAN TRAIL	5/19/2001	Sheriff's department measured a 52-knot wind gust during a severe thunderstorm. Minutes later, large hail was reported. There were also power outages.
STALLINGS	5/19/2001	Emergency management reported trees down.
WINGATE	5/19/2001	Emergency operations center reported six trees down between Wingate and Marshville.
INDIAN TRAIL	5/22/2001	Sheriff's department reported three large trees down, with large limbs landing on roofs.
WINGATE	6/22/2001	A very strong microburst completely tore the roof off one duplex and damaged five others. Numerous trees and power lines also brought down.
MONROE	8/9/2001	Two trees were snapped off by marginally-severe thunderstorm winds.
MONROE	4/17/2006	Quite a few trees down.
MARSHVILLE	4/22/2006	Power lines down between Marshville and New Salem. A tree and large limbs also down on Medlin-Roberts Rd, with roof damage to several barns and sheds in the area.
WINGATE	4/22/2006	A couple trees blown down.
FAIRVIEW	5/26/2006	Three large oak trees blown down, one on a house.
NEW SALEM	5/26/2006	A couple trees blown down.
FAIRVIEW	6/11/2006	Trees down on Unionville Brief Rd.
MONROE	6/12/2006	Numerous trees and power lines down in the area around the intersection of Potter and Newton Rds.
MONROE	8/4/2006	Trees down on highway 205 near Olive Branch Rd.
WAXHAW	8/4/2006	Trees blown down just south of Waxhaw near highway 75 and power lines blown down in Waxhaw.
MONROE	8/9/2006	Several trees down between highway 601 and Morgan Mill Rd and another tree down along Lawyers Rd.

MARSHVILLE	11/16/2006	Six trees blown down along highway 205, with additional trees down on Olive Branch Rd.
ALTON	4/4/2008	A tree was blown down on McManus Rd.
WAXHAW	4/4/2008	A tree was blown down on Parkwood School Rd.
MONROE	5/20/2008	Numerous trees were blown down across much of the county.
WAXHAW	6/11/2008	A tree was blown down and the roof blown off a barn on S Potters Rd.
WAXHAW	6/11/2008	Trees blown down.
STALLINGS	6/27/2008	A large tree and several large limbs were blown down across Stallings.
MONROE	7/8/2008	Numerous trees and power lines were blown down across the county.
MARVIN	7/23/2008	Large tree limbs were blown down.
STOUTS	7/23/2008	Numerous trees were uprooted, two large storage containers blown around, and garage doors blown in on Stinson Hartis Rd.
UNIONVILLE	2/28/2011	Several trees were blown down a little way south of Fairview.
WEDDINGTON	4/5/2011	Numerous trees were blown down across Union County, with several roads closed around Monroe due to downed trees.
WAXHAW ARPT	5/11/2011	Numerous trees were blown down to the south of Waxhaw, toward the state line.
ALTON	5/11/2011	Multiple trees were blown down along highway 207, near the state line.
ALLEN XRDS	6/10/2011	Several trees were blown down in the Allens Crossroads area, with one tree down on a fire truck.
WAXHAW	6/18/2011	Numerous trees and power lines were blown down across the county.
INDIAN TRAIL ARPT	7/13/2011	Several large tree limbs were blown down at Lawyers Rd and Stevens Mill Rd, near the Mecklenburg County line.
HAMILTONS XRDS	7/25/2011	A tree was blown down near highway 205 and Ansonville Rd.
ALLEN XRDS	7/25/2011	A tree was blown down on Camden Rd about 4.5 miles south of Marshville.
MONROE	8/8/2011	Numerous trees were blown down from just east of the Monroe city limits toward Marshville.
STALLINGS	8/11/2011	A few trees were blown down in the Water Oak area.
MONROE	8/11/2011	A tree was blown down onto a house on Johnson St in Monroe.
MINERAL SPG	8/11/2011	Trees were blown down on Pleasant Grove Rd.
INDIAN TRAIL	8/21/2011	Several trees and power lines were blown down.
HAMILTONS XRDS	8/21/2011	A tree was blown down on Ansonville Rd.
NEW SALEM	8/21/2011	A tree was blown down on highway 205 near New Salem.
MARSHVILLE	3/24/2012	Two large trees were blown down at Olive Branch Rd and Old Gold Mine Rd.
HOUSTON	4/3/2012	Multiple trees were blown down along Waxhaw Highway, especially near the intersection of South Rocky River Rd.
WESLEY CHAPEL	6/24/2012	Trees were blown down on power lines on Antioch Church Rd.
FAIRVIEW	7/1/2012	Trees were blown down near Fairview and in Unionville. More than two dozen trees were felled on the Wingate University campus, with the roofs of several buildings and some automobiles damaged by the fallen trees. Another tree fell on a convenience store in Wingate.
WINGATE	7/1/2012	Multiple trees were blown down near the intersection of Macedonia Church Rd and highway 601.
MINERAL SPG	7/3/2012	A tree was blown down on Nesbit Rd and another tree down on Plyler Mill Rd several miles southwest of Monroe.
MONROE	7/5/2012	Multiple trees and power lines were blown down on Franklin St and Bragg St in the city with large limbs down at Medlin Rd and Macedonia Church Rd.

		Other large limbs were blown down on Wolf Pond Rd near Joe Collins Rd and four trees blown down on Bruce Thomas Rd near Stack Rd. Trees fell on seven homes, with four of the homes incurring major damage.
MONROE	7/9/2012	Several trees were blown down from Monroe to Wingate.
HAMILTONS XRDS	7/9/2012	Several power lines were blown down on Ansonville Rd.
WEDDINGTON	7/10/2012	Multiple trees and large limbs were blown down in the Blakeney area.
MONROE	7/16/2012	A few trees were blown down along Wolf Pond Rd, including one tree that fell on a vehicle south of the Marvin Watkins Rd intersection.
WAXHAW	7/24/2012	Multiple trees were blown down around the Waxhaw area.
WEDDINGTON	7/27/2012	Multiple trees and power lines were blown down from near Waxhaw to near Monroe.
FAIRFIELD	8/2/2012	Multiple trees were blown down along New Salem Rd from the Tarton Mill Rd intersection to the highway 200 intersection.
MINERAL SPG	8/6/2015	County comms reported multiple trees blown down between Waxhaw and Monroe.
NEW SALEM	9/4/2015	County comms reported multiple trees blown down along Highway 218 east of Fairview.
STURDIVANTS	4/3/2017	Shingles were blown off an outbuilding on Gulledge Rd and a carport was blown across a road. A couple of trees were also blown down.
MARSHVILLE	7/5/2017	County comms reported multiple trees and power lines blown down in the Marshville area.
UNIONVILLE	7/15/2017	Public reported numerous trees blown down, several houses with roof damage and multiple chicken houses heavily damaged or destroyed in and around Unionville.
STOUTS	7/28/2017	Law enforcement reported trees blown down on Flagstone Ln.
WAXHAW	10/23/2017	County comms reported multiple trees and power lines blown down in the Waxhaw area.
BAKERS	4/19/2019	Public reported trees blown down, a collapsed shed and damage to a silo north of Union.
BAKERS	6/22/2019	County comms reported multiple trees blown down off Highway 601 just north of Monroe.
UNIONVILLE	4/13/2020	Public reported (via Social Media) trees blown down on Unionville Brief Rd.
WAXHAW ARPT	5/22/2020	Amateur radio reported trees blown down and blocking Providence Road South.
INDIAN TRAIL ARPT	5/29/2020	Public reported via Social Media a few trees blown down in the vicinity of Highway 218.
FAIRFIELD	7/18/2020	County comms reported at least two trees blown down, with one blocking New Salem Rd.
STOUTS	7/18/2020	Public reported (via Social Media) trees blown down on Painted Horse Dr and large limbs down on Secreat Short Cut Rd.
UNIONVILLE	8/31/2020	Fire dept reported trees blown down near the intersection of Unionville Rd and Sikes Mill Rd.
WAXHAW	8/14/2021	Public reported trees blown down near Cuthbertson Rd and Providence Rd South.
NEW SALEM	3/31/2022	Public reported multiple trees blown down at Highway 205 and Highway 218.
WAXHAW	5/6/2022	County comms reported numerous trees blown down between Waxhaw and Monroe.
ALTON	5/23/2022	Media reported trees blown down and minor damage to a house.
WAXHAW ARPT	6/3/2022	Public reported multiple utility poles down on Dapple Ridge Rd.
MONROE	6/16/2022	Emergency manager reported trees blown down throughout Union County.

SHALETON	7/6/2022	Public reported trees blown down off Spring Meadow Ln.
WESLEY CHAPEL	7/7/2022	Emergency manager reported multiple trees and large limbs blown down near the intersection of New Town Rd and Potter Rd South.
STOUTS	7/9/2022	County comms reported a tree blown down and blocking roadway on Indian Trail Fairview Rd at 1st Ave in Indian Trail. Another tree was down on Boyte Rd at Valley St.
STALLINGS	7/23/2023	Utility company reported trees and limbs blown down on power lines.
UNIONVILLE	7/30/2023	Spotter reported multiple trees and some power lines blown down.
WAXHAW	8/7/2023	County comms reported numerous trees blown down across the county, with two trees down on houses in Monroe, one on a vehicle in Marshville, and others down on power lines.
FAIRVIEW	5/8/2024	Utility company reported trees blown down on power lines.
MONROE	5/8/2024	Public reported several trees blown down in the Monroe area.
WAXHAW ARPT	5/8/2024	Public reported a couple of trees blown down in southern Union County.
WESLEY CHAPEL	6/30/2024	Utility company reported several trees and power lines blown down in the Wesley Chapel area. Public also reported trees down near Weddington.
HOUSTON	7/6/2024	Utility company reported trees and large limbs blown down on power lines southwest of Monroe.

TABLE H.14: WINTER STORM EVENTS

Date	Description
Cabarrus County	
1/6/1996	Rain gradually changed to freezing rain and then snow and sleet across the southern Piedmont. The precipitation continued well into the next day. The layer of ice under the 1 to 2 inches of snow caused serious traffic problems. All across western and central North Carolina, numerous traffic accidents and sledding accidents were reported. There were numerous indirect injuries and a few fatalities associated with the storm. Most injuries and deaths were traffic related. In Alexander, a man was crushed when an outbuilding collapsed from the weight of the snow.
1/11/1996	The second snowstorm within a week caused more excitement in North Carolina. Up to a foot of snow was reported in some of the mountains with most mountain and foothill locations receiving 3 to 6 inches. In the piedmont, there was more of a mixture of ice with minimal ice storm conditions reported in and around the Charlotte area. There were some power outages and numerous traffic accidents.
2/3/1996	Light snow accumulated to 1 to 3 inches on top of the ice. Travel problems worsened in some places.
2/16/1996	Snow fell and accumulated to several inches with heavier amounts in the northern mountains.
2/19/1999	A surface low moving across central Georgia and South Carolina combined with a strong upper level system to produce light snow across much of western North Carolina during the afternoon. Most accumulations were between 1 and 2 inches. Although there was a band of 3-inch accumulations stretching from the northern mountains, southeast through Morganton and to Shelby. Also, some isolated accumulations of around 8 inches were reported from the very highest peaks in the northern mountains.
1/16/2008	Light snow developed across the Piedmont during mid-evening, and continued through much of the overnight hours. By mid-morning on the 17th, total accumulations ranged from around an inch south of I-85, to 3 inches or so along the I-40 corridor. Sleet and freezing rain mixed in with the snow before the event ended.
1/22/2008	Freezing drizzle and light freezing rain developed across the western Piedmont around sunrise. Roads became very slick and hazardous, and there were numerous traffic accidents during the morning commute.
2/16/2015	A mix of sleet, snow, and freezing rain overspread the I-77 corridor in Charlotte metro and surrounding areas during late afternoon. Sleet became the primary precipitation type during the evening, before precipitation transitioned to freezing rain south of the I-85 corridor by late evening. Deteriorating road conditions were reported throughout the evening. By midnight, heavy accumulations of sleet and/or freezing rain were reported. Most areas saw around a half inch to an inch of sleet, along with around a tenth of an inch of ice accretion. However, areas south of I-85 saw more in the way of freezing rain, with up to a quarter inch of ice accretion reported in addition to light sleet accumulations. Scattered power outages were therefore more concentrated there. Roads became very treacherous and impassable in many areas until melting began on the afternoon of the 17th.
2/23/2015	Light snow associated with a wave of low pressure overspread the foothills and Piedmont of the Carolinas by late evening of the 23rd, and continued through the overnight before tapering off during the morning of the 24th. Accumulations ranged from a dusting to 2 inches, with the highest amounts generally occurring closer to the mountains. Temperatures right around freezing and warm roads resulted in minimal travel issues.
2/25/2015	After the light snow that fell across portions of the Piedmont on the morning of the 24th, an area of low pressure moving along the Gulf Coast spread yet another round of snow across the North Carolina Piedmont during the evening. Heavy snowfall accumulations were reported in many areas north of the I-85 corridor by midnight. Due to occasional transitions to rain undercutting snowfall rates, total accumulations were generally in the 2 to 4 inch range, although localized

	amounts as high as 7 inches were reported across the northwest Piedmont. The snow tapered off before sunrise.
1/6/2017	As an area of surface low pressure moved northeast along the Gulf and Southeast coasts, moisture overspread the North Carolina Piedmont throughout the 6th. As cold air gradually spilled in from the north, precipitation slowly transitioned from rain to sleet and snow. By daybreak on the 7th, locations across far northern Gaston, Mecklenburg, and Cabarrus Counties had received as much as 5 inches of snow, while locations near the South Carolina border were just beginning to transition to sleet. By the time the precipitation had tapered off to flurries during late morning, mostly snow had fallen near the Iredell, Rowan, and Lincoln County lines, and total accumulations there ranged from 4 to 6 inches. Meanwhile, locations from Gastonia, through Uptown Charlotte to Concord saw quite a bit of sleet, with total accumulations of sleet and snow ranging from 1 to 3 inches. Locations closer to the South Carolina border saw primarily sleet and rain, with some sleet accumulations as high as one half inch.
2/5/2017	Very light freezing precipitation developed briefly across portions of the Piedmont during the pre-dawn hours. This caused some patchy areas of a light glaze that resulted in a few accidents.
3/12/2017	An upper level disturbance interacting with an unseasonably cold air mass resulted in an area of snow that moved quickly across much of the western Piedmont and foothills of North Carolina during the morning of the 12th. Precipitation began as rain in some areas, but quickly changed to snow. Most locations saw total snowfall accumulation from a dusting to less than two inches. However, some locations across the southern Piedmont saw up to 3 inches.
1/23/2019	Patchy light freezing rain developed across western North Carolina during the early morning hours of the 23rd and continued off and on through mid-morning. Ice accretion was generally confined to areas north of I-85, and was quite light in most areas, around a tenth of an inch or less. Some slick spots developed on roads, resulting in a few traffic accidents.
4/2/2019	Moisture associated with an area of low pressure developing off the southeast coast overspread an unseasonably cool air mass over the Piedmont during the morning hours. Precipitation initially fell as a mix of rain and snow. However, pockets of snow developed in association with heavier precipitation rates. This resulted in some areas of accumulation in the 0.5 to 1-inch range, mainly in areas south and east of the city of Charlotte. However, up to 2 inches fell across portions of Union County. Despite warm pavement, snowfall rates were such that snow accumulated on some roadways, resulting in slick spots.
1/16/2022	Moisture overspread the North Carolina Piedmont early on the 16th as strengthening low pressure moved across the Deep South. Strong northeast winds supplied ample cold air for the precipitation to begin as light snow across much of the area, resulting in light snow accumulations of up to a couple of inches during the pre-dawn hours. Slight warming of the air aloft resulted in snow changing to sleet across much of this area by sunrise. By late morning, total snow and sleet accumulations of 2 to 5 inches were reported, with locations north of I-40 seeing more snow than sleet, and locations south of I-85 seeing more sleet. Further warming aloft resulted in precipitation briefly changing to freezing rain before tapering off by early afternoon, with light ice accretion reported on top of the sleet and snow. However, scattered snow showers redeveloped during the afternoon and evening, producing spotty additional light accumulations.
Stanly County	
1/17/2008	Between one to two inches of snow accumulated countywide mostly before daybreak.
1/19/2008	Around one-half inch of snow accumulated during the afternoon and early evening hours.
1/10/2011	Six inches of snow fell across the area during the morning and afternoon hours. Snow changed over to freezing rain during the afternoon resulting in nearly an eighth inch of ice on top of the snow. All area roads were covered in snow resulting in the closure of schools and businesses.
2/16/2015	Snowfall amounts of a half of an inch to an inch fell across the county. In addition, around a tenth of an inch of freezing rain accrual was reported.
2/24/2015	Snowfall amounts of a trace to 1 inch fell across the county.

2/25/2015	Snowfall/sleet amounts of 2 to 3 inches fell across the county.
1/7/2017	Snowfall amounts ranged from a dusting across southern portions of the county to near 1 inch across the north.
1/16/2022	Snow and sleet amounts ranged from one to two inches across the county, with up to a quarter of an inch of freezing rain.
Union County	
1/6/1996	Rain gradually changed to freezing rain and then snow and sleet across the southern Piedmont. The precipitation continued well into the next day. The layer of ice under the 1 to 2 inches of snow caused serious traffic problems. All across western and central North Carolina, numerous traffic accidents and sledding accidents were reported. There were numerous indirect injuries and a few fatalities associated with the storm. Most injuries and deaths were traffic related. In Alexander, a man was crushed when an outbuilding collapsed from the weight of the snow.
1/11/1996	The second snowstorm within a week caused more excitement in North Carolina. Up to a foot of snow was reported in some of the mountains with most mountain and foothill locations receiving 3 to 6 inches. In the piedmont, there was more of a mixture of ice with minimal ice storm conditions reported in and around the Charlotte area. There were some power outages and numerous traffic accidents.
1/16/2008	Light snow developed across the Piedmont during mid-evening, and continued through much of the overnight hours. By mid-morning on the 17th, total accumulations ranged from around an inch south of I-85, to 3 inches or so along the I-40 corridor. Sleet and freezing rain mixed in with the snow before the event ended.
1/22/2008	Freezing drizzle and light freezing rain developed across the western Piedmont around sunrise. Roads became very slick and hazardous, and there were numerous traffic accidents during the morning commute.
2/16/2015	A mix of sleet, snow, and freezing rain overspread the I-77 corridor in Charlotte metro and surrounding areas during late afternoon. Sleet became the primary precipitation type during the evening, before precipitation transitioned to freezing rain south of the I-85 corridor by late evening. Deteriorating road conditions were reported throughout the evening. By midnight, heavy accumulations of sleet and/or freezing rain were reported. Most areas saw around a half inch to an inch of sleet, along with around a tenth of an inch of ice accretion. However, areas south of I-85 saw more in the way of freezing rain, with up to a quarter inch of ice accretion reported in addition to light sleet accumulations. Scattered power outages were therefore more concentrated there. Roads became very treacherous and impassable in many areas until melting began on the afternoon of the 17th.
1/7/2017	As an area of surface low pressure moved northeast along the Gulf and Southeast coasts, moisture overspread the Piedmont throughout the 6th. Most of the precipitation fell as rain south of the I-85 corridor. However, as cold air gradually spilled in from the north, a transition to mainly sleet with some pockets of freezing rain occurred. By mid-morning on the 7th, locations closer to the I-85 corridor had up to a half inch of mainly sleet, while some locations saw a light glaze of ice, mainly on elevated surfaces.
3/12/2017	An upper level disturbance interacting with an unseasonably cold air mass resulted in an area of snow that moved quickly across much of the western Piedmont and foothills of North Carolina during the morning of the 12th. Precipitation began as rain in some areas, but quickly changed to snow. Most locations saw total snowfall accumulation from a dusting to less than two inches. However, some locations across the southern Piedmont saw up to 3 inches.
4/2/2019	Moisture associated with an area of low pressure developing off the southeast coast overspread an unseasonably cool air mass over the Piedmont during the morning hours. Precipitation initially fell as a mix of rain and snow. However, pockets of snow developed in association with heavier precipitation rates. This resulted in some areas of accumulation in the 0.5 to 1-inch range, mainly in areas south and east of the city of Charlotte. However, up to 2 inches fell across portions of

	Union County. Despite warm pavement, snowfall rates were such that snow accumulated on some roadways, resulting in slick spots.

Appendix I
FEMA National Risk Index Report

National Risk Index

June 27, 2024

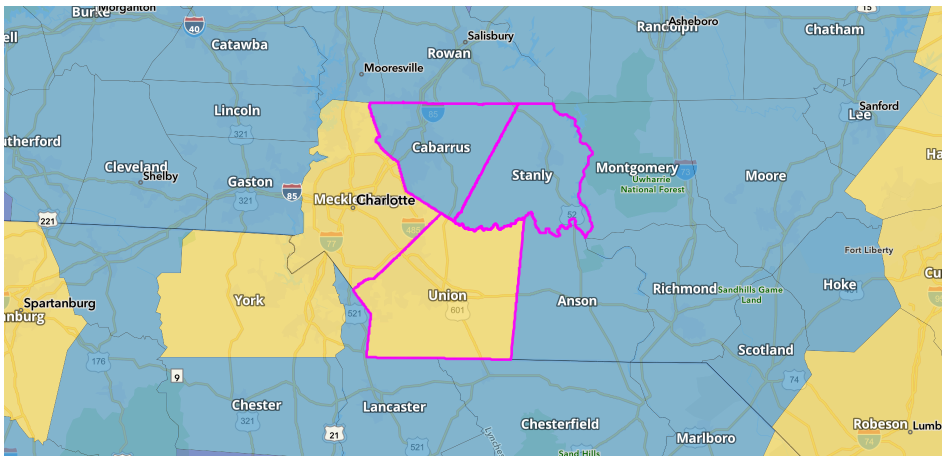
Risk Comparison Report

Use this report to determine how risk factors in selected communities compare to each other. Click a community name in any table below to open an individual risk profile report for that community and review its risk factors in more detail.

While reviewing this report, keep in mind that low risk is driven by lower loss due to natural hazards, lower social vulnerability, and higher community resilience.

For more information about the National Risk Index, its data, and how to interpret the information it provides, please review the **About the National Risk Index** and **How to Take Action** sections at the end of this report. Or, visit the National Risk Index website at hazards.fema.gov/nri/learn-more to access supporting documentation and links.

Risk Index



Risk Index Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

No Rating | Not Applicable | Insufficient Data

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively Moderate	86.06	0 — 100
2	Cabarrus County	NC	Relatively Low	80.11	0 — 100
3	Stanly County	NC	Relatively Low	56.89	0 — 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$29,307,258	Relatively Low	Relatively High	1	$29,226,426	86.06
2	Cabarrus County	NC	$19,360,957	Relatively Moderate	Relatively High	1.04	$20,209,185	80.11
3	Stanly County	NC	$6,576,042	Relatively Moderate	Relatively Moderate	1.16	$7,625,741	56.89

Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's relative risk for only that hazard type.

Avalanche

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
	Cabarrus County	NC	Not Applicable		
	Stanly County	NC	Not Applicable		
	Union County	NC	Not Applicable		

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
	Cabarrus County	NC	N/A	Relatively Moderate	Relatively High	1.04	N/A	N/A
	Stanly County	NC	N/A	Relatively Moderate	Relatively Moderate	1.16	N/A	N/A
	Union County	NC	N/A	Relatively Low	Relatively High	1	N/A	N/A

Coastal Flooding

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
	Cabarrus County	NC	Not Applicable		
	Stanly County	NC	Not Applicable		
	Union County	NC	Not Applicable		

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
	Cabarrus County	NC	N/A	Relatively Moderate	Relatively High	1.04	N/A	N/A
	Stanly County	NC	N/A	Relatively Moderate	Relatively Moderate	1.16	N/A	N/A
	Union County	NC	N/A	Relatively Low	Relatively High	1	N/A	N/A

Cold Wave

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
	Cabarrus County	NC	No Rating	0	0 100
	Stanly County	NC	No Rating	0	0 100
	Union County	NC	No Rating	0	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
	Cabarrus County	NC	$0	Relatively Moderate	Relatively High	1.04	$0	0
	Stanly County	NC	$0	Relatively Moderate	Relatively Moderate	1.16	$0	0
	Union County	NC	$0	Relatively Low	Relatively High	1	$0	0

Drought

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively Low	51.61	0 100
2	Stanly County	NC	Very Low	36.3	0 100
3	Cabarrus County	NC	Very Low	34.9	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$27,470	Relatively Low	Relatively High	1	$31,645	51.61
2	Stanly County	NC	$7,031	Relatively Moderate	Relatively Moderate	1.16	$7,669	36.3
3	Cabarrus County	NC	$6,475	Relatively Moderate	Relatively High	1.04	$6,300	34.9

Earthquake

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively Low	85.36	0 100
2	Cabarrus County	NC	Relatively Low	80.5	0 100
3	Stanly County	NC	Very Low	65.03	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$1,676,573	Relatively Low	Relatively High	1	$1,781,368	85.36
2	Cabarrus County	NC	$1,070,435	Relatively Moderate	Relatively High	1.04	$1,142,494	80.5
3	Stanly County	NC	$307,266	Relatively Moderate	Relatively Moderate	1.16	$359,134	65.03

Hail

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively Moderate	86.99	0 100
2	Cabarrus County	NC	Relatively Moderate	83.46	0 100
3	Stanly County	NC	Relatively Low	55.93	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$869,087	Relatively Low	Relatively High	1	$860,238	86.99
2	Cabarrus County	NC	$619,646	Relatively Moderate	Relatively High	1.04	$642,408	83.46
3	Stanly County	NC	$123,600	Relatively Moderate	Relatively Moderate	1.16	$142,756	55.93

Heat Wave

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Cabarrus County	NC	Relatively Moderate	78.56	0 100
2	Union County	NC	Relatively Low	68.76	0 100
3	Stanly County	NC	Relatively Low	65.42	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Cabarrus County	NC	$475,578	Relatively Moderate	Relatively High	1.04	$504,402	78.56
2	Union County	NC	$265,937	Relatively Low	Relatively High	1	$266,137	68.76
3	Stanly County	NC	$187,839	Relatively Moderate	Relatively Moderate	1.16	$218,888	65.42

Hurricane

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively Low	83.54	0 100
2	Cabarrus County	NC	Relatively Low	79.32	0 100

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
3	Stanly County	NC	Relatively Low	77.25	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$6,043,023	Relatively Low	Relatively High	1	$6,036,499	83.54
2	Cabarrus County	NC	$3,745,935	Relatively Moderate	Relatively High	1.04	$3,874,366	79.32
3	Stanly County	NC	$2,713,060	Relatively Moderate	Relatively Moderate	1.16	$3,141,867	77.25

Ice Storm

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Cabarrus County	NC	Very High	98.87	0 100
2	Union County	NC	Very High	98	0 100
3	Stanly County	NC	Relatively Moderate	71.42	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Cabarrus County	NC	$3,013,343	Relatively Moderate	Relatively High	1.04	$3,158,472	98.87
2	Union County	NC	$2,502,965	Relatively Low	Relatively High	1	$2,435,598	98
3	Stanly County	NC	$160,071	Relatively Moderate	Relatively Moderate	1.16	$186,256	71.42

Landslide

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Cabarrus County	NC	Relatively Moderate	81.63	0 100
2	Stanly County	NC	Relatively Low	42.95	0 100
3	Union County	NC	Relatively Low	25.96	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Cabarrus County	NC	$122,400	Relatively Moderate	Relatively High	1.04	$123,548	81.63
2	Stanly County	NC	$21,900	Relatively Moderate	Relatively Moderate	1.16	$25,193	42.95
3	Union County	NC	$21,900	Relatively Low	Relatively High	1	$21,799	25.96

Lightning

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively Moderate	83.37	0 100
2	Stanly County	NC	Relatively Low	69.11	0 100
3	Cabarrus County	NC	Relatively Low	61.97	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$404,996	Relatively Low	Relatively High	1	$399,450	83.37
2	Stanly County	NC	$168,721	Relatively Moderate	Relatively Moderate	1.16	$198,455	69.11
3	Cabarrus County	NC	$145,997	Relatively Moderate	Relatively High	1.04	$153,497	61.97

Riverine Flooding

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Cabarrus County	NC	Relatively Low	69.33	0 100
2	Union County	NC	Relatively Low	54.44	0 100
3	Stanly County	NC	Relatively Low	51.61	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Cabarrus County	NC	$1,111,735	Relatively Moderate	Relatively High	1.04	$1,125,320	69.33
2	Union County	NC	$552,779	Relatively Low	Relatively High	1	$580,637	54.44
3	Stanly County	NC	$439,175	Relatively Moderate	Relatively Moderate	1.16	$502,113	51.61

Strong Wind

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively High	93.99	0 100
2	Cabarrus County	NC	Relatively Moderate	84.09	0 100
3	Stanly County	NC	Relatively Low	56.98	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$2,540,179	Relatively Low	Relatively High	1	$2,535,624	93.99
2	Cabarrus County	NC	$1,162,682	Relatively Moderate	Relatively High	1.04	$1,219,613	84.09
3	Stanly County	NC	$410,586	Relatively Moderate	Relatively Moderate	1.16	$474,251	56.98

Tornado

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively High	95.86	0 100
2	Cabarrus County	NC	Relatively Moderate	91.7	0 100
3	Stanly County	NC	Relatively Low	69.49	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$14,317,262	Relatively Low	Relatively High	1	$14,197,065	95.86
2	Cabarrus County	NC	$7,759,105	Relatively Moderate	Relatively High	1.04	$8,131,581	91.7
3	Stanly County	NC	$2,016,355	Relatively Moderate	Relatively Moderate	1.16	$2,345,352	69.49

Tsunami

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
	Cabarrus County	NC	Not Applicable		
	Stanly County	NC	Not Applicable		
	Union County	NC	Not Applicable		

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
	Cabarrus County	NC	N/A	Relatively Moderate	Relatively High	1.04	N/A	N/A
	Stanly County	NC	N/A	Relatively Moderate	Relatively Moderate	1.16	N/A	N/A

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
	Union County	NC	N/A	Relatively Low	Relatively High	1	N/A	N/A

Volcanic Activity

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
	Cabarrus County	NC	Not Applicable		
	Stanly County	NC	Not Applicable		
	Union County	NC	Not Applicable		

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
	Cabarrus County	NC	N/A	Relatively Moderate	Relatively High	1.04	N/A	N/A
	Stanly County	NC	N/A	Relatively Moderate	Relatively Moderate	1.16	N/A	N/A
	Union County	NC	N/A	Relatively Low	Relatively High	1	N/A	N/A

Wildfire

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Cabarrus County	NC	Very Low	64.4	0 100
2	Union County	NC	Very Low	55.17	0 100
3	Stanly County	NC	Very Low	37.45	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Cabarrus County	NC	$110,110	Relatively Moderate	Relatively High	1.04	$108,993	64.4
2	Union County	NC	$61,176	Relatively Low	Relatively High	1	$56,578	55.17
3	Stanly County	NC	$16,533	Relatively Moderate	Relatively Moderate	1.16	$19,281	37.45

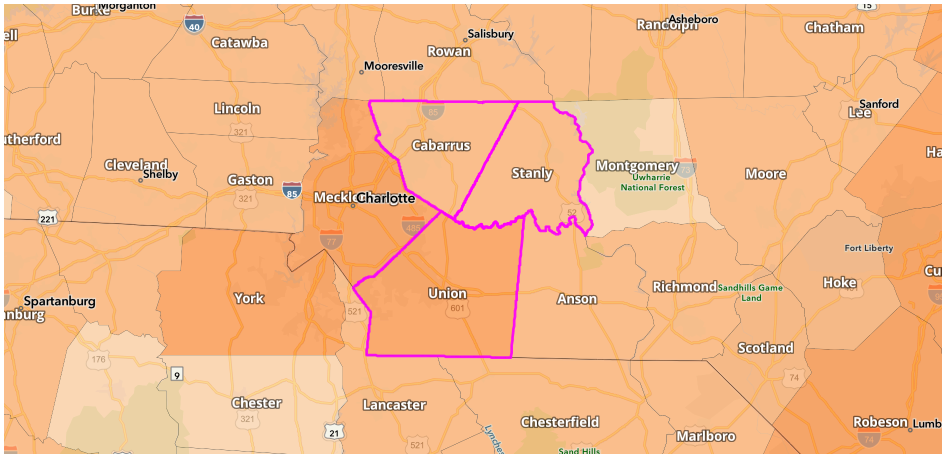
Winter Weather

Rank	Community	State	Risk Index Rating	Risk Index Score	National Percentile
1	Union County	NC	Relatively Low	28.38	0 100
2	Cabarrus County	NC	Very Low	22.4	0 100
3	Stanly County	NC	Very Low	7	0 100

Rank	Community	State	EAL Value	Social Vulnerability	Community Resilience	CRF	Risk Value	Risk Index Score
1	Union County	NC	$23,912	Relatively Low	Relatively High	1	$23,788	28.38
2	Cabarrus County	NC	$17,516	Relatively Moderate	Relatively High	1.04	$18,193	22.4
3	Stanly County	NC	$3,906	Relatively Moderate	Relatively Moderate	1.16	$4,524	7

Expected Annual Loss

Expected Annual Loss measures the expected loss each year due to natural hazards.



Expected Annual Loss Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

No Expected Annual Losses | Not Applicable | Insufficient Data

Rank	Community	State	EAL Value	Score
1	Union County	NC	$29,307,258	87
2	Cabarrus County	NC	$19,360,957	80.97
3	Stanly County	NC	$6,576,042	55.8

Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type.

Avalanche

Rank	Community	State	EAL Value	Score
	Cabarrus County	NC	N/A	--
	Stanly County	NC	N/A	--
	Union County	NC	N/A	--

Coastal Flooding

Rank	Community	State	EAL Value	Score
	Cabarrus County	NC	N/A	--
	Stanly County	NC	N/A	--
	Union County	NC	N/A	--

Cold Wave

Rank	Community	State	EAL Value	Score
	Cabarrus County	NC	$0	0.0
	Stanly County	NC	$0	0.0
	Union County	NC	$0	0.0

Drought

Rank	Community	State	EAL Value	Score
1	Union County	NC	$27,470	52.8
2	Stanly County	NC	$7,031	38.2
3	Cabarrus County	NC	$6,475	37.5

Earthquake

Rank	Community	State	EAL Value	Score
1	Union County	NC	$1,676,573	84.4
2	Cabarrus County	NC	$1,070,435	79.4
3	Stanly County	NC	$307,266	63.8

Hail

Rank	Community	State	EAL Value	Score
1	Union County	NC	$869,087	88.6
2	Cabarrus County	NC	$619,646	84.8
3	Stanly County	NC	$123,600	57.4

Heat Wave

Rank	Community	State	EAL Value	Score
1	Cabarrus County	NC	$475,578	81.1
2	Union County	NC	$265,937	72.4
3	Stanly County	NC	$187,839	66.9

Hurricane

Rank	Community	State	EAL Value	Score
1	Union County	NC	$6,043,023	82.3
2	Cabarrus County	NC	$3,745,935	78.5
3	Stanly County	NC	$2,713,060	75.0

Ice Storm

Rank	Community	State	EAL Value	Score
1	Cabarrus County	NC	$3,013,343	99.0
2	Union County	NC	$2,502,965	98.7
3	Stanly County	NC	$160,071	71.8

Landslide

Rank	Community	State	EAL Value	Score
1	Cabarrus County	NC	$122,400	83.9
2	Stanly County	NC	$21,900	53.8
3	Union County	NC	$21,900	35.0

Lightning

Rank	Community	State	EAL Value	Score
1	Union County	NC	$404,996	85.4
2	Stanly County	NC	$168,721	69.4
3	Cabarrus County	NC	$145,997	65.6

Riverine Flooding

Rank	Community	State	EAL Value	Score
1	Cabarrus County	NC	$1,111,735	73.0
2	Union County	NC	$552,779	57.1
3	Stanly County	NC	$439,175	52.4

Strong Wind

Rank	Community	State	EAL Value	Score
1	Union County	NC	$2,540,179	95.3
2	Cabarrus County	NC	$1,162,682	85.7
3	Stanly County	NC	$410,586	58.6

Tornado

Rank	Community	State	EAL Value	Score
1	Union County	NC	$14,317,262	96.3
2	Cabarrus County	NC	$7,759,105	92.6
3	Stanly County	NC	$2,016,355	70.5

Tsunami

Rank	Community	State	EAL Value	Score
	Cabarrus County	NC	N/A	--
	Stanly County	NC	N/A	--

Rank	Community	State	EAL Value	Score
	Union County	NC	N/A	--

Volcanic Activity

Rank	Community	State	EAL Value	Score
	Cabarrus County	NC	N/A	--
	Stanly County	NC	N/A	--
	Union County	NC	N/A	--

Wildfire

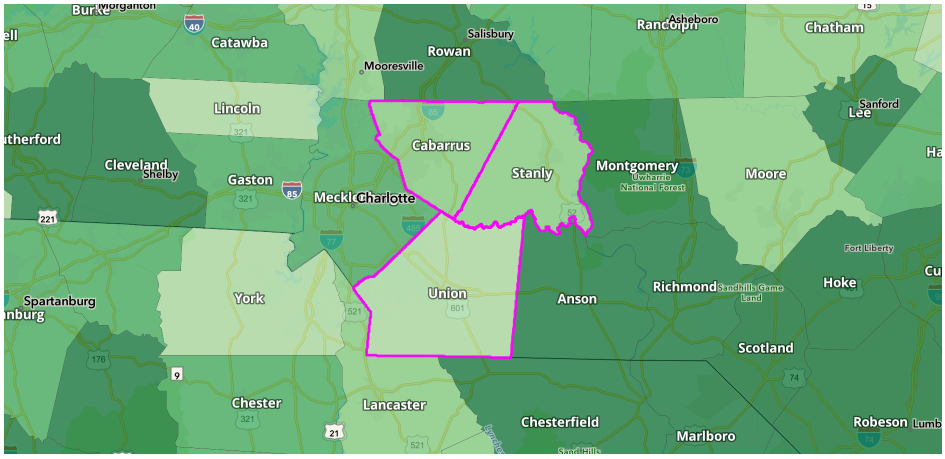
Rank	Community	State	EAL Value	Score
1	**Cabarrus County**	NC	$110,110	65.4
2	**Union County**	NC	$61,176	57.6
3	**Stanly County**	NC	$16,533	36.4

Winter Weather

Rank	Community	State	EAL Value	Score
1	**Union County**	NC	$23,912	34.5
2	**Cabarrus County**	NC	$17,516	27.4
3	**Stanly County**	NC	$3,906	9.9

Social Vulnerability

Social Vulnerability measures the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood.



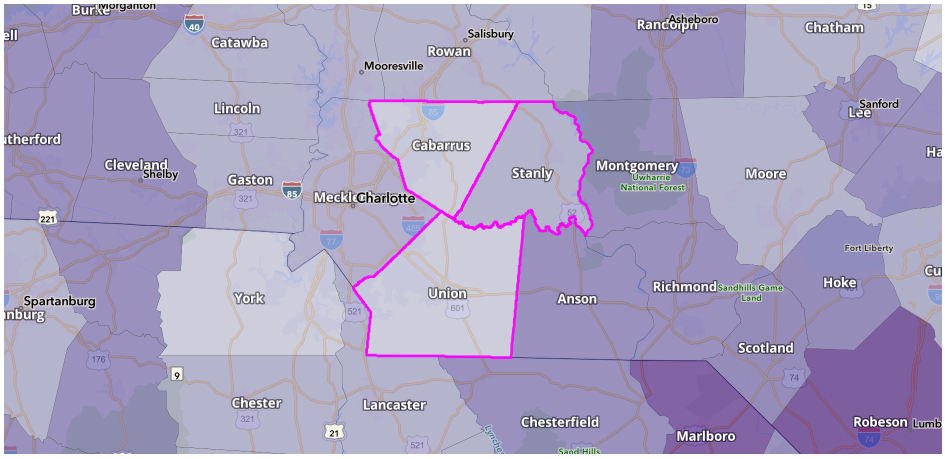
Social Vulnerability Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

Rank	Community	State	Rating	Score
1	Stanly County	NC	Relatively Moderate	55.4
2	Cabarrus County	NC	Relatively Moderate	43.4
3	Union County	NC	Relatively Low	22.1

Community Resilience

Community Resilience measures a County's ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.



Community Resilience Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

Rank	Community	State	Rating	Score
1	Cabarrus County	NC	Relatively High	72.6
2	Union County	NC	Relatively High	60.6
3	Stanly County	NC	Relatively Moderate	57.4

About the National Risk Index

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

Explore the National Risk Index Map at **hazards.fema.gov/nri/map**.

Visit the National Risk Index website at **hazards.fema.gov/nri/learn-more** to access supporting documentation and links.

Calculating the Risk Index

Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience:

Risk Index = Expected Annual Loss × Social Vulnerability ÷ Community Resilience

Risk Index scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit **hazards.fema.gov/nri/determining-risk**.

Calculating Expected Annual Loss

Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios for 18 hazard types:

Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio

Expected Annual Loss scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit **hazards.fema.gov/nri/expected-annual-loss**.

Calculating Social Vulnerability

Social Vulnerability is measured using the Social Vulnerability Index (SVI) published by the Centers for Disease Control and Prevention (CDC).

For more information, visit **hazards.fema.gov/nri/social-vulnerability**.

Calculating Community Resilience

Community Resilience is measured at the County level using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit **hazards.fema.gov/nri/community-resilience**.

How to Take Action

There are many ways to reduce natural hazard risk through mitigation. Communities with high National Risk Index scores can take action to reduce risk by decreasing Expected Annual Loss due to natural hazards, decreasing Social Vulnerability, and increasing Community Resilience.

For information about how to take action and reduce your risk, visit **hazards.fema.gov/nri/take-action**.

Disclaimer

The National Risk Index (the Risk Index or the Index) and its associated data are meant for planning purposes only. This tool was created for broad nationwide comparisons and is not a substitute for localized risk assessment analysis. Nationwide datasets used as inputs for the National Risk Index are, in many cases, not as accurate as available local data. Users with access to local data for each National Risk Index risk factor should consider substituting the Risk Index data with local data to recalculate a more accurate risk index. If you decide to download the National Risk Index data and substitute it with local data, you assume responsibility for the accuracy of the data and any resulting data index. Please visit the **Contact Us** page if you would like to discuss this process further.

The methodology used by the National Risk Index has been reviewed by subject matter experts in the fields of natural hazard risk research, risk analysis, mitigation planning, and emergency management. The processing methods used to create the National Risk Index have produced results similar to those from other natural hazard risk analyses conducted on a smaller scale. The breadth and combination of geographic information systems (GIS) and data processing techniques leveraged by the National Risk Index enable it to incorporate multiple hazard types and risk factors, manage its nationwide scope, and capture what might have been missed using other methods.

The National Risk Index does not consider the intricate economic and physical interdependencies that exist across geographic regions. Keep in mind that hazard impacts in surrounding counties or Census tracts can cause indirect losses in your community regardless of your community's risk profile.

Nationwide data available for some risk factors are rudimentary at this time. The National Risk Index will be continuously updated as new data become available and improved methodologies are identified.

The National Risk Index Contact Us page is available at **hazards.fema.gov/nri/contact-us**.

Prepared by and Return to Concord City Attorney ROD Box PIN: 5603-33-6923

NORTH CAROLINA
CABARRUS COUNTY

STORMWATER CONTROL MEASURE (SCM), ACCESS EASEMENT AND MAINTENANCE AGREEMENT

THIS STORMWATER CONTROL MEASURE (SCM), ACCESS EASEMENT AND MAINTENANCE AGREEMENT ("Agreement"), made this _____ day of _____, 2025, by Cabarrus County, a body politic and political subdivision of the State of North Carolina, whose principal address is 65 Church Street SE, Concord, NC 28025 (hereinafter "Grantor"), with, to, and for the benefit of the City of Concord, a municipal corporation of the State of North Carolina, whose address is P.O. Box 308, Concord North Carolina 28026-0308, (hereinafter "Grantee" or "City").

W I T N E S S E T H:

WHEREAS, Grantor is the owner in fee simple of certain real property situated in the City of Concord, County of Cabarrus, North Carolina, and more particularly described as follows: 505 Sunnyside Drive SE, Concord, NC, Cabarrus County Property Identification Number (PIN): 5603-33-6923. Being the land conveyed to Grantor by deed recorded in Book and Page 16552/160 in the Office of the Register of Deeds for Cabarrus County (hereinafter referred to as the "Property"); and

WHEREAS, Grantor desires to develop and/or redevelop all or portions of the Property; and

WHEREAS, the Property is located within the planning jurisdiction of the City of Concord, and is subject to certain requirements set forth in the City of Concord Code of Ordinances Chapter 60, the Concord Development Ordinance, (hereafter "CCDO"), and the Concord Technical Standards Manual (hereafter "Concord Manual"); and

WHEREAS, conditions for development and/or redevelopment of the Property includes (i) the construction, operation and maintenance of an engineered stormwater control structure, namely a Wet Detention Basin, as provided in the CCDO and the Concord Manual (the "Stormwater Control Measure" or "SCM"), (ii) Grantor's dedication of a non-exclusive access easement to the City, as described in this Agreement, for inspection and maintenance of the Stormwater Control Measure; and (iii) the assumption by Grantor of certain specified maintenance and repair responsibilities; and

MEMORADUM

DATE:	Friday, April 11, 2025
TO:	Jackie Deal, Director of Engineering
FROM:	Veronika Galitsky, Construction Manager
SUBJECT:	Infrastructure Acceptance
PROJECT NAME:	Axial Bonds Farm-Tract 1
PROJECT NUMBER:	2022-061A
DEVELOPER:	Axial Industrial
FINAL CERTIFICATION - LOT NUMBERS:	Site
INFRASTRUCTURE TYPE:	Water
COUNCIL ACCEPTANCE DATE:	Thursday, April 10, 2025
ONE-YEAR WARRANTY DATE:	Friday, April 10, 2026

Water Infrastructure	Quantity
12-inch in LF	23.00
12-inch Valves	1

MEMORADUM

DATE:	Friday, April 11, 2025
TO:	Jackie Deal, Director of Engineering
FROM:	Veronika Galitsky, Construction Manager
SUBJECT:	Infrastructure Acceptance
PROJECT NAME:	Axial Bonds Farm-Tract 2
PROJECT NUMBER:	2022-061B
DEVELOPER:	MP I-85 Bonds Industrial, LLC
FINAL CERTIFICATION - LOT NUMBERS:	Site
INFRASTRUCTURE TYPE:	Water and Sewer
COUNCIL ACCEPTANCE DATE:	Thursday, April 10, 2025
ONE-YEAR WARRANTY DATE:	Friday, April 10, 2026

Water Infrastructure	Quantity
8-inch in LF	34.00
8-inch Valves	1

Sanitary Sewer Infrastructure	Quantity
6-inch in LF	20.00

MEMORADUM

DATE:	Friday, April 11, 2025
TO:	Jackie Deal, Director of Engineering
FROM:	Veronika Galitsky, Construction Manager
SUBJECT:	Infrastructure Acceptance
PROJECT NAME:	Chick-Fil-A-Concord PKWY
PROJECT NUMBER:	2023-055
DEVELOPER:	Chick-Fil-A
FINAL CERTIFICATION - LOT NUMBERS:	Site
INFRASTRUCTURE TYPE:	Water
COUNCIL ACCEPTANCE DATE:	Thursday, April 10, 2025
ONE-YEAR WARRANTY DATE:	Friday, April 10, 2026

Water Infrastructure	Quantity
8-inch in LF	46.00
8-inch Valves	1

MEMORADUM

DATE:	Friday, April, 2025
TO:	Jackie Deal, Director of Engineering
FROM:	Veronika Galitsky, Construction Manager
SUBJECT:	Infrastructure Acceptance
PROJECT NAME:	Christenbury Village Phase 4 (Mixed use)
PROJECT NUMBER:	2021-035C
DEVELOPER:	MPV Properties
FINAL CERTIFICATION - LOT NUMBERS:	Lot 3
INFRASTRUCTURE TYPE:	Water
COUNCIL ACCEPTANCE DATE:	Thursday, April 10, 2025
ONE-YEAR WARRANTY DATE:	Friday, April 10, 2026

Water Infrastructure	Quantity
4-inch in LF	26.00

MEMORADUM

DATE:	Friday, April 11, 2025
TO:	Jackie Deal, Director of Engineering
FROM:	Veronika Galitsky, Construction Manager
SUBJECT:	Infrastructure Acceptance
PROJECT NAME:	Lincoln St. Townhomes
PROJECT NUMBER:	2023-019
DEVELOPER:	WeBuild Concord
FINAL CERTIFICATION - LOT NUMBERS:	1-26
INFRASTRUCTURE TYPE:	Water and Sewer
COUNCIL ACCEPTANCE DATE:	Thursday, April 10, 2025
ONE-YEAR WARRANTY DATE:	Friday, April 10, 2026

Water Infrastructure	Quantity
6-inch in LF	285.00
6-inch Valves	2
Hydrants	1

Sanitary Sewer Infrastructure	Quantity
8-inch in LF	336.00
Manholes as EA	3

MEMORADUM

DATE:	Friday, April 11, 2025
TO:	Jackie Deal, Director of Engineering
FROM:	Veronika Galitsky, Construction Manager
SUBJECT:	Infrastructure Acceptance
PROJECT NAME:	Smith Industrial Subdivision
PROJECT NUMBER:	2021-083
DEVELOPER:	WD & SH Property Consulting, LLC
FINAL CERTIFICATION - LOT NUMBERS:	Site
INFRASTRUCTURE TYPE:	Water
COUNCIL ACCEPTANCE DATE:	Thursday, April 10, 2025
ONE-YEAR WARRANTY DATE:	Friday, April 10, 2026

Water Infrastructure	Quantity
8-inch in LF	533.00
8-inch Valves	2
Hydrants	2

MEMORADUM

DATE:	Friday, April 11, 2025
TO:	Jeff Corley, Water Resources Director
FROM:	Veronika Galitsky, Construction Manager
SUBJECT:	Infrastructure Acceptance
PROJECT NAME:	The Mills at Rocky River Townhomes
PROJECT NUMBER:	2021-037
DEVELOPER:	Platinum at Rocky River LLC
FINAL CERTIFICATION - LOT NUMBERS:	1-95
INFRASTRUCTURE TYPE:	Water and Sewer
COUNCIL ACCEPTANCE DATE:	Thursday, April 10, 2025
ONE-YEAR WARRANTY DATE:	Friday, April 10, 2026

Water Infrastructure	Quantity
8-inch in LF	1731.00
8-inch Valves	14
2-inch in LF	596.00
2-inch Valves	2
Hydrants	3

Sanitary Sewer Infrastructure	Quantity
8-inch in LF	2823.00
Manholes as EA	18

ORD. #

AN ORDINANCE TO AMEND FY 2024-2025 BUDGET ORDINANCE

WHEREAS, the City Council of the City of Concord, North Carolina did on the 13th day of June, 2024, adopt a City budget for the fiscal year beginning July 1, 2024 and ending on June 30, 2025, as amended; and

WHEREAS, it is appropriate to amend the expense/expenditures and the revenue accounts in the funds listed for the reason stated;

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Concord that in accordance with the authority contained in G.S. 159-15, the following accounts are hereby amended as follows:

Revenues

Account	Title	Current Budget	Amended Budget	(Decrease) Increase
100-4370000	Fund Balance Appropriated	6,082,330	6,084,830	2,500
	Total			**2,500**

Expenses/Expenditures

Account	Title	Current Budget	Amended Budget	(Decrease) Increase
4190-5470043	Golf Tournaments	14,385	16,885	2,500
	Total			**2,500**

Reason: To appropriate Mayor Golf Tournament reserves for a donation to the Pearls of Purpose Foundation to assist with scholarship grants for qualified Cabarrus County high school students.

Adopted this 10th day of April 2025.

CITY COUNCIL
CITY OF CONCORD
NORTH CAROLINA

_____
William C. Dusch, Mayor

ATTEST: _____
Kim Deason, City Clerk

_____
VaLerie Kolczynski, City Attorney

ORD. #

AN ORDINANCE TO AMEND FY 2024-2025 BUDGET ORDINANCE

WHEREAS, the City Council of the City of Concord, North Carolina did on the 13th day of June, 2024, adopt a City budget for the fiscal year beginning July 1, 2024 and ending on June 30, 2025, as amended; and

WHEREAS, it is appropriate to amend the expense/expenditures and the revenue accounts in the funds listed for the reason stated;

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Concord that in accordance with the authority contained in G.S. 159-15, the following accounts are hereby amended as follows:

Revenues

Account	Title	Current Budget	Amended Budget	(Decrease) Increase
100-4370000	Fund Balance Appropriated	6,084,830	6,087,330	2,500
	Total			**2,500**

Expenses/Expenditures

Account	Title	Current Budget	Amended Budget	(Decrease) Increase
4190-5470043	Golf Tournaments	16,885	19,385	2,500
	Total			**2,500**

Reason: To appropriate Mayor Golf Tournament reserves for a donation to Zion Hill AME Zion Church to assist with costs for Enlighten Summer Camp.

Adopted this 10th day of April 2025.

CITY COUNCIL
CITY OF CONCORD
NORTH CAROLINA

_____
William C. Dusch, Mayor

ATTEST: _____
Kim Deason, City Clerk

_____
VaLerie Kolczynski, City Attorney

CAPITAL PROJECT ORDINANCE AMENDMENT

BE IT ORDAINED by the City Council of the City of Concord, North Carolina that pursuant to Section 13.2 Chapter 159 of the General Statutes of North Carolina, the following project ordinance is hereby ordained:

SECTION 1. The project authorized is the **Airport Projects.**

SECTION 2. The City Manager is hereby authorized to proceed with the implementation of the project within terms of a grant agreement with the Federal Aviation Administration and the N.C. Department of Transportation – Division of Aviation.

SECTION 3. SECTION 3. The following revenues are anticipated to be available to the City of Concord for the project:

Revenues

Account	Title	Current Budget	Amended Budget	(Decrease) Increase
451-4357300	Federal Aid	9,590,149	10,606,723	1,016,574
451-4603400	Future Grants	3,800,000	2,755,391	(1,044,609)
	Total			**(28,035)**

Section 4. The following amounts are appropriated for the project

Expenses/Expenditures

Account	Title	Current Budget	Amended Budget	(Decrease) Increase
6300-5800461 6300-5800461	EMAS STUDY	102,974	105,975	3,001
6300-5800462 6300-5800462	COMM TERM APRON EXP.	0	3,250	3,250
6300-5800726 6300-5800726	Fuel Farm	1,629,171	1.701,778	72,607
6300-5811082 6300-5811082	Future Projects	100,773	56,164	(44,609)
6306-5800449 6306-5800449	Long Term Parking Upgrade	1,239,382	1,035,488	(203,894)
6306-5986000 6306-5986000	Transfer To Aviation	816,886	1,020,780	203,894
6309-5800454 6309-5800454	North Apron Roadway	362,287	370,562	8,275
6311-5800455 6311-5800455	Mistywood	1,765,184	1.694.625	(70,559)
	Total			**(28,035)**

SECTION 5. Accounting records are to be maintained by the Finance Department of the City of Concord in such manner as (1) to provide all information required by the grant agreement and other agreements executed or to be executed with the various parties involved with the project; and (2) to comply with the Local Government Budget and Fiscal Control Act of the State of North Carolina.

SECTION 6. Within five (5) days after adopted, copies of this grant project amendment shall be filed with the City Manager, Finance Director, and City Clerk for direction in carrying out this project.

SECTION 7. The Finance Director is directed to report on the financial status of this project in accordance with the existing City policy. She shall also report to the City Manager any unusual occurrences.

Duly adopted by the City Council of the City of Concord, North Carolina this the 10th day of April, 2025.

CITY COUNCIL
CITY OF CONCORD
NORTH CAROLINA

_____
William C. Dusch, Mayor

ATTEST: _____
Kim Deason, City Clerk

_____
Valerie Kolczynski, City Attorney

8.13 City of Concord Computer Network, Email, and Internet Access Policy

Purpose

The City of Concord provides employees with access to its computer network, email, and the internet to support business operations, facilitate communication, and enhance productivity. This policy establishes the City's commitment to ensuring the secure, responsible, and appropriate use of these resources. Users are required to abide by all of the applicable rules.

Procedures, permitted use, security requirements, and other guidelines related to the City's computer network, email, and internet access, employees should refer to the **City Manager Policy: City of Concord Acceptable Use & Technology Access.**

Tax Report for Fiscal Year 2024-2025

FINAL REPORT	February
Property Tax Receipts- Munis	
2024 BUDGET YEAR	811,528.21
2023	42,524.49
2022	582.39
2021	458.49
2020	244.28
2019	23.04
2018	54.63
2017	23.04
2016	23.04
2015	24.00
Prior Years	23.10
Interest	29,167.96
Refunds	
	884,676.67
Vehicle Tax Receipts- County	
2024 BUDGET YEAR	499,893.08
2023	
2022	
2021	
2020	
2019	
2018	
Prior Years	
Penalty & Interest	9,004.48
Refunds	
	508,897.56
Fire District Tax - County	
2024 BUDGET YEAR	7,350.20
Less: Collection Fee from County	
Net Ad Valorem Collections	1,400,924.43
423:Vehicle Tag Fee-Transportion Impr Fund	33,501.60
100:Vehicle Tag Fee	136,035.80
630:Vehicle Tag Fee-Transportion Fund	33,501.60
Less Collection Fee - Transit	
Net Vehicle Tag Collection	203,039.00
Privilege License	-
Prepaid Privilege Licenses	
Privilege License interest	
Total Privilege License	-
Oakwood Cemetery current	2,975.00
Oakwood Cemetery endowment	1,966.64
Rutherford Cemetery current	6,408.36
Rutherford Cemetery endowment	-
West Concord Cemetery current	-
West Concord Cemetery endowment	-
Total Cemetery Collections	11,350.00
Total Collections	$ 1,615,313.43

Current Year	
Original Scroll	
Levy	
Penalty	
Adjustments	
Public Service	
Levy	
Penalty	
Discoveries/Annex	2,002.01
Discovery Penalty	562.00
Total Amount Invoiced - Monthly	2,564.01
Total Amount Invoiced - YTD	94,439,180.24
Current Year	
Less Abatements (Releases)	
Real	44,069.99
Personal	
Discovery	
Penalty - all	
Total Abatements	44,069.99
Adjusted Amount Invoiced - monthly	(41,505.98)
Adjusted Amount Invoiced - YTD	93,822,518.99
Current Levy Collected	811,528.21
Levy Collected from previous years	43,980.50
Penalties & Interest Collected	29,167.96
Current Month Write Off - Debit/Credit	-
Total Monthly Collected	884,676.67
Total Collected - YTD	92,622,520.38
Total Collected - net current levy -YTD	92,254,936.12
Percentage of Collected -current levy	98.33%
Amount Uncollected - current year levy	1,567,582.87
Percentage of Uncollected - current levy	1.67%
	100.00%

CITY OF CONCORD

Summary of Releases, Refunds and Discoveries for the Month of February 2025

RELEASES		
CITY OF CONCORD	**$**	**44,069.99**
CONCORD DOWNTOWN	**$**	**-**

REFUNDS		
CITY OF CONCORD	**$**	**5,461.09**
CONCORD DOWNTOWN	**$**	**-**

DISCOVERIES

CITY OF CONCORD

TaxYear	Real	Personal	Total	Rate	Calculated	Penalties
2019	0	0	0	0.0048	0.00	0.00
2020	0	0	0	0.0048	0.00	0.00
2021	0	0	0	0.0048	0.00	0.00
2022	0	118,085	118,085	0.0048	566.81	226.72
2023	0	120,773	120,773	0.0048	579.71	164.18
2024	0	203,688	203,688	0.0042	855.49	171.10
2025	0	0	0	0.0042	0.00	0.00
Total	**0**	**442,546**	**442,546**		**$ 2,002.01**	**$ 562.00**

DOWNTOWN

TaxYear	Real	Personal	Total	Rate	Calculated	Penalties
2019	0	0	0	0.0023	0.00	0.00
2020	0	0	0	0.0023	0.00	0.00
2021	0	0	0	0.0023	0.00	0.00
2022	0	0	0	0.0023	0.00	0.00
2023	0	0	0	0.0023	0.00	0.00
2024	0	0	0	0.0016	0.00	0.00
Total	**0**	**0**	**0**		**$ -**	**$ -**

City of Concord
Portfolio Holdings
Monthly Investments to Council
Report Format: By Transaction
Group By: Security Type
Average By: Cost Value
Portfolio / Report Group: All Portfolios
As of 2/28/2025

Description	CUSIP/Ticker	Face Amount/Shares	Cost Value	Maturity Date	YTM @ Cost	% of Portfolio	Settlement Date	Cost Price	Days To Maturity
Commercial Paper									
CP NATIXIS NY 0 5/9/2025	63873JS92	5,000,000.00	4,872,394.44	5/9/2025	4.577	1.04	10/15/2024	97.447889	70
CP TORONTO DOMINION BANK 0 5/16/2025	89119ASG4	5,000,000.00	4,871,775.00	5/16/2025	4.577	1.04	10/21/2024	97.4355	77
CP BNP PARIBAS NY 0 5/23/2025	09659BSP6	5,000,000.00	4,832,995.85	5/23/2025	4.624	1.03	8/27/2024	96.659917	84
CP SALVATION ARMY 0 6/3/2025	79583RT3	5,000,000.00	4,872,227.78	6/3/2025	4.474	1.04	11/4/2024	97.444556	95
CP TOYOTA MTR CR CORP 0 6/6/2025	89233GT63	5,000,000.00	4,836,358.35	6/6/2025	4.528	1.04	9/10/2024	96.727167	98
CP ROYAL BANK OF CP 0 7/18/2025	78013VUJ9	5,000,000.00	4,851,638.89	7/18/2025	4.493	1.04	11/15/2024	97.032778	140
CP MUFG BK LTD NY 0 8/22/2025	62479LVN2	5,000,000.00	4,840,008.33	8/22/2025	4.525	1.04	12/2/2024	96.800167	175
CP CREDIT AGRICOLE CIB NY 0 9/12/2025	22533TWC6	5,000,000.00	4,837,813.89	9/12/2025	4.537	1.04	12/20/2024	96.756278	196
CP PURE GROVE FDG 0 10/14/2025	74625TXE1	5,000,000.00	4,843,638.90	10/14/2025	4.470	1.04	1/27/2025	96.872778	228
Sub Total / Average Commercial Paper		45,000,000.00	43,658,851.43		4.534	9.35		97.02069	129
FFCB Bond									
FFCB 5 3/10/2025	3133EPCW3	5,000,000.00	5,000,989.35	3/10/2025	4.984	1.07	8/10/2023	100.019787	10
FFCB 0.71 4/21/2025-22	3133EMWH1	5,000,000.00	5,000,000.00	4/21/2025	0.710	1.07	4/21/2021	100	52
FFCB 0.53 9/29/2025-21	3133EMBH4	5,000,000.00	5,000,000.00	9/29/2025	0.530	1.07	9/29/2020	100	213
FFCB 1.21 12/22/2025-22	3133ENHU7	5,000,000.00	5,000,000.00	12/22/2025	1.210	1.07	12/22/2021	100	297
FFCB 4.625 3/5/2026	3133EP4K8	5,000,000.00	4,999,610.20	3/5/2026	4.628	1.07	3/22/2024	99.992204	370
FFCB 0.625 6/16/2026-21	3133EMKV3	5,000,000.00	5,000,000.00	6/16/2026	0.625	1.07	12/17/2020	100	473
FFCB 4.75 9/1/2026	3133EPUW3	5,000,000.00	4,971,300.00	9/1/2026	4.961	1.06	9/22/2023	99.426	550
FFCB 0.94 9/28/2026-22	3133EM6E7	5,000,000.00	5,000,000.00	9/28/2026	0.940	1.07	9/28/2021	100	577
FFCB 1.55 3/30/2027-23	3133ELUN2	5,000,000.00	5,000,000.00	3/30/2027	1.550	1.07	3/30/2020	100	760
FFCB 4.48 4/6/2027-26	3133ERR78	5,000,000.00	4,995,500.00	4/6/2027	4.514	1.07	1/10/2025	99.91	767
FFCB 4.58 8/27/2027-25	3133ERRA1	5,000,000.00	5,000,000.00	8/27/2027	4.580	1.07	8/27/2024	100	910
FFCB 4.4 10/4/2027-25	3133ERVZ1	5,000,000.00	5,000,000.00	10/4/2027	4.400	1.07	10/4/2024	100	948
FFCB 1.4 3/10/2028-22	3133EMSW3	5,000,000.00	5,000,000.00	3/10/2028	1.400	1.07	3/10/2021	100	1,106
FFCB 1.5 3/23/2028-22	3133EMUB6	5,000,000.00	5,000,000.00	3/23/2028	1.500	1.07	3/23/2021	100	1,119
FFCB 1.04 1/25/2029-22	3133EMNL2	5,000,000.00	4,986,250.00	1/25/2029	1.076	1.07	2/16/2021	99.725	1,427
FFCB 1.55 3/15/2029-22	3133EMSX1	5,000,000.00	4,960,000.00	3/15/2029	1.658	1.06	3/24/2021	99.2	1,476
Sub Total / Average FFCB Bond		80,000,000.00	79,913,649.55		2.454	17.11		99.892605	690
FHLB Bond									
FHLB 0 6/20/2025	313385HC3	5,000,000.00	4,864,730.55	6/20/2025	4.296	1.04	10/30/2024	97.294611	112
FHLB 0.4 7/15/2025-21	3130AKM29	5,000,000.00	4,999,000.00	7/15/2025	0.405	1.07	1/29/2021	99.98	137
FHLB 0.5 10/20/2025-21	3130AKNK8	5,000,000.00	4,999,000.00	10/20/2025	0.504	1.07	1/20/2021	99.98	234
FHLB Step 12/30/2025-21	3130AKLH7	5,000,000.00	5,000,000.00	12/30/2025	0.636	1.07	12/30/2020	100	305
FHLB Step 1/29/2026-21	3130AKRA6	5,000,000.00	5,000,000.00	1/29/2026	1.002	1.07	1/29/2021	100	335
FHLB 0.53 2/17/2026-21	3130AKWS1	5,000,000.00	4,995,000.00	2/17/2026	0.550	1.07	2/17/2021	99.9	354
FHLB 0.8 3/10/2026-21	3130ALFS8	5,000,000.00	5,000,000.00	3/10/2026	0.800	1.07	3/10/2021	100	375
FHLB Step 4/29/2026-21	3130ALZA5	5,000,000.00	5,000,000.00	4/29/2026	1.432	1.07	4/29/2021	100	425
FHLB 1 5/26/2026-23	3130AMME9	5,000,000.00	4,769,250.00	5/26/2026	4.356	1.02	12/20/2024	95.385	452
FHLB 4.36 10/15/2026-25	3130B3BS1	5,000,000.00	5,000,000.00	10/15/2026	4.360	1.07	10/15/2024	100	594
FHLB 4.4 11/13/2026-25	3130G3PG2	5,000,000.00	5,000,000.00	11/13/2026	4.400	1.07	11/18/2024	100	623
FHLB 3.86 12/18/2026-25	3130B2W68	4,985,000.00	4,985,000.00	12/18/2026	3.860	1.07	9/30/2024	100	658
FHLB 4.375 1/8/2027-26	3130B4GP0	5,000,000.00	5,000,000.00	1/8/2027	4.375	1.07	1/8/2025	100	679
FHLB 4.35 2/12/2027-26	3130B4Y88	5,000,000.00	4,993,750.00	2/12/2027	4.416	1.07	2/14/2025	99.875	714
FHLB 0.825 8/17/2027-21	3130AJXH7	5,000,000.00	4,986,250.00	8/17/2027	0.866	1.07	8/28/2020	99.725	900
FHLB 4.8 7/24/2028-25	3130B4GL9	5,000,000.00	5,000,000.00	7/24/2028	4.800	1.07	1/24/2025	100	1,242
FHLB 4.45 12/4/2028-26	3130B3XH1	5,000,000.00	5,000,000.00	12/4/2028	4.450	1.07	12/4/2024	100	1,375
FHLB 4.25 9/10/2029-25	3130B2TX3	5,000,000.00	5,000,000.00	9/10/2029	4.250	1.07	9/23/2024	100	1,655

FHLB 2.32 11/1/2029-22	3130AHEU3	5,000,000.00	5,000,000.00	11/1/2029	2.320	1.07	11/1/2019	100	1,707
Sub Total / Average FHLB Bond		94,985,000.00	94,591,980.55		2.735	20.25		99.599691	679
FHLMC Bond									
FHLMC 0.375 7/21/2025	3137EAEU9	1,315,000.00	1,215,559.70	7/21/2025	3.063	0.26	8/4/2022	92.438	143
FHLMC 0.375 9/23/2025	3137EAEX3	1,570,000.00	1,405,668.10	9/23/2025	4.166	0.30	10/6/2022	89.533	207
FHLMC 0.375 9/23/2025	3137EAEX3	1,010,000.00	893,535.53	9/23/2025	4.694	0.19	11/4/2022	88.468864	207
FHLMC 0.375 9/23/2025	3137EAEX3	560,000.00	504,624.88	9/23/2025	4.156	0.11	12/6/2022	90.111586	207
FHLMC 0.8 7/14/2026-21	3134GV5T1	5,000,000.00	5,000,000.00	7/14/2026	0.800	1.07	7/14/2020	100	501
FHLMC 3.75 8/28/2026-25	3134HAHZ9	5,000,000.00	4,966,150.00	8/28/2026	4.095	1.06	8/30/2024	99.323	546
FHLMC 4.25 2/22/2027-24	3134H1SN4	5,000,000.00	4,952,500.00	2/22/2027	4.593	1.06	2/22/2024	99.05	724
FHLMC 2.67 3/25/2027-24	3134GXNM2	5,000,000.00	4,745,882.69	3/25/2027	4.500	1.02	3/25/2024	94.917654	755
FHLMC 4.1 5/20/2027-25	3134GAD91	5,000,000.00	4,977,705.00	5/20/2027	4.290	1.07	11/20/2024	99.5541	811
FHLMC 5.25 6/17/2027-25	3134H12Q5	5,000,000.00	5,000,000.00	6/17/2027	5.250	1.07	6/21/2024	100	839
FHLMC 4.375 6/25/2027-25	3134H13G6	5,000,000.00	4,961,910.00	6/25/2027	4.650	1.06	6/25/2024	99.2382	847
FHLMC 3.5 7/1/2027-25	3134HAPH0	5,000,000.00	4,972,500.00	7/1/2027	3.713	1.06	9/27/2024	99.45	853
FHLMC 4.5 7/9/2027-25	3134H14T7	5,000,000.00	4,967,500.00	7/9/2027	4.736	1.06	7/15/2024	99.35	861
FHLMC 3.375 9/23/2027-25	3134HALQ4	5,000,000.00	4,964,770.00	9/23/2027	3.624	1.06	9/23/2024	99.2954	937
FHLMC 3.625 10/15/2027-25	3134HASE4	5,000,000.00	4,962,500.00	10/15/2027	3.892	1.06	10/15/2024	99.25	959
FHLMC 4.65 11/12/2027-25	3134HAZQ9	5,000,000.00	5,000,000.00	11/12/2027	4.650	1.07	11/14/2024	100	987
FHLMC 4 12/9/2027-25	3134GAL35	5,000,000.00	4,967,900.00	12/9/2027	4.230	1.06	12/9/2024	99.358	1,014
FHLMC 4.4 12/16/2027-25	3134HAP80	5,000,000.00	4,991,250.00	12/16/2027	4.463	1.07	12/20/2024	99.825	1,021
FHLMC 4.25 1/10/2028-25	3134HAZ48	5,000,000.00	4,986,100.00	1/10/2028	4.350	1.07	1/10/2025	99.722	1,046
FHLMC 4.3 2/4/2028-27	3134HA5M1	5,000,000.00	5,000,000.00	2/4/2028	4.300	1.07	2/4/2025	100	1,071
FHLMC 4.75 2/14/2028-25	3134HA6J7	5,000,000.00	5,000,000.00	2/14/2028	4.750	1.07	2/14/2025	100	1,081
FHLMC Step 7/10/2029-25	3134HAZ55	5,000,000.00	5,000,000.00	7/10/2029	4.577	1.07	1/13/2025	100	1,593
FHLMC Step 8/20/2029-25	3134HAGE7	5,000,000.00	5,000,000.00	8/20/2029	4.286	1.07	8/20/2024	100	1,634
Sub Total / Average FHLMC Bond		99,455,000.00	98,436,055.90		4.186	21.07		99.024563	921
FNMA Bond									
FNMA 0.625 4/22/2025	3135G03U5	1,360,000.00	1,268,407.71	4/22/2025	3.017	0.27	5/5/2022	93.265273	53
FNMA 0.625 4/22/2025	3135G03U5	5,000,000.00	4,761,950.00	4/22/2025	4.500	1.02	1/12/2024	95.239	53
FNMA 0.5 6/17/2025	3135G04Z3	925,000.00	861,249.00	6/17/2025	2.892	0.18	6/6/2022	93.108	109
FNMA 0.5 6/17/2025	3135G04Z3	1,365,000.00	1,271,599.52	6/17/2025	2.943	0.27	7/7/2022	93.157474	109
FNMA 0.7 7/14/2025-21	3136G4YH0	5,000,000.00	5,000,000.00	7/14/2025	0.700	1.07	7/14/2020	100	136
FNMA 0.55 8/19/2025-22	3136G4H63	5,000,000.00	5,000,000.00	8/19/2025	0.550	1.07	8/19/2020	100	172
FNMA 0.58 8/25/2025-22	3136G4J20	5,000,000.00	5,000,000.00	8/25/2025	0.580	1.07	8/25/2020	100	178
FNMA 0.375 8/25/2025	3135G05X7	920,000.00	839,132.00	8/25/2025	3.521	0.18	9/7/2022	91.21	178
FNMA 0.5 11/7/2025	3135G06G3	1,295,000.00	1,169,555.72	11/7/2025	4.152	0.25	1/5/2023	90.313183	252
FNMA 0.5 11/7/2025	3135G06G3	830,000.00	743,924.04	11/7/2025	4.682	0.16	3/7/2023	89.629402	252
FNMA 0.5 11/7/2025	3135G06G3	885,000.00	815,301.29	11/7/2025	3.719	0.17	4/5/2023	92.12444	252
FNMA 0.57 12/29/2025-21	3135GABS9	5,000,000.00	4,563,350.00	12/29/2025	4.967	0.98	11/17/2023	91.267	304
FNMA 2.125 4/24/2026	3135G0K36	545,000.00	519,466.75	4/24/2026	3.805	0.11	5/3/2023	95.315	420
FNMA 0.75 7/30/2026-20	3136G4D91	1,000,000.00	888,980.00	7/30/2026	5.116	0.19	10/27/2023	88.898	517
FNMA 0.73 10/29/2026-21	3136G46F5	5,000,000.00	5,000,000.00	10/29/2026	0.730	1.07	10/29/2020	100	608
FNMA 5.3 3/4/2027-25	3135GAPU9	5,000,000.00	5,000,000.00	3/4/2027	5.300	1.07	3/4/2024	100	734
FNMA 4.25 4/9/2027-25	3135GAQU8	5,000,000.00	4,951,479.86	4/9/2027	4.600	1.06	4/9/2024	99.029597	770
FNMA 3.5 9/24/2027-25	3135GAVE8	5,000,000.00	4,932,000.00	9/24/2027	3.997	1.06	10/21/2024	98.64	938
FNMA 0.8 11/4/2027-22	3135GA2L4	5,000,000.00	5,000,000.00	11/4/2027	0.800	1.07	11/4/2020	100	979
FNMA 4.85 1/21/2028-25	3136GA6E4	5,000,000.00	5,000,000.00	1/21/2028	4.850	1.07	1/21/2025	100	1,057
Sub Total / Average FNMA Bond		64,125,000.00	62,586,395.89		2.957	13.40		97.725397	499
Local Government Investment Pool									
NC CLASS LGIP	NCCLASS	48,436,933.68	48,436,933.68	N/A	4.451	10.37	5/24/2024	100	1
NCCMT LGIP	NCCMT481	3,332,254.98	3,332,254.98	N/A	4.270	0.71	12/31/2005	100	1
Sub Total / Average Local Government Investment Pool		51,769,188.66	51,769,188.66		4.439	11.08		100	1
Money Market									
PINNACLE BANK MM	PINNACLE	21,488,186.89	21,488,186.89	N/A	4.400	4.60	3/31/2019	100	1
Sub Total / Average Money Market		21,488,186.89	21,488,186.89		4.400	4.60		100	1
Treasury Bill									
T-Bill 0 3/20/2025	912797KJ5	5,000,000.00	4,897,533.35	3/20/2025	4.389	1.05	9/27/2024	97.950667	20

Sub Total / Average Treasury Bill		5,000,000.00	4,897,533.35		4.389	1.05		97.950667	20
Treasury Note									
T-Note 0.25 10/31/2025	91282CAT8	5,000,000.00	4,845,689.50	10/31/2025	4.194	1.04	1/10/2025	96.91379	245
T-Note 2.25 11/15/2025	912828M56	5,000,000.00	4,925,075.95	11/15/2025	4.250	1.05	2/7/2025	98.501519	260
Sub Total / Average Treasury Note		10,000,000.00	9,770,765.45		4.222	2.09		97.714105	253
Total / Average		471,822,375.55	467,112,607.67		3.504	100		99.042478	534