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Concord
NORTH CAROLINA
High Performance Living

CITY OF CONCORD

Open Space Connectivity Analysis Plan

ADOPTED | 5.09.19




ACKNOWLEDGMENTS

City of Concord
William C. "Bill" Dusch - *Mayor*
Lloyd Payne – *City Manager*
Brian Hiatt – *Previous City Manager*
Merl Hamilton – *Previous Deputy City Manager*
Concord City Council Members
Parks and Recreation Department
Transportation Department
Planning and Community Development Department
Engineering Department
Building and Grounds Department
Water Resources Department
Engineering Department

Connectivity Committee

City of Concord Residents

Consultant Team

McAdams Company, Design Lead
Kristen Mansfield - *Project Manager*
Iona Thomas - *Principal-in-Charge*
Graham Bruns - *Greenway Engineer*
Drew Singleton - *GIS Specialist*
Garrett Jenkins - *Graphics Specialist*



MCADAMS

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- Process
- Project Advisory Committee + Stakeholders
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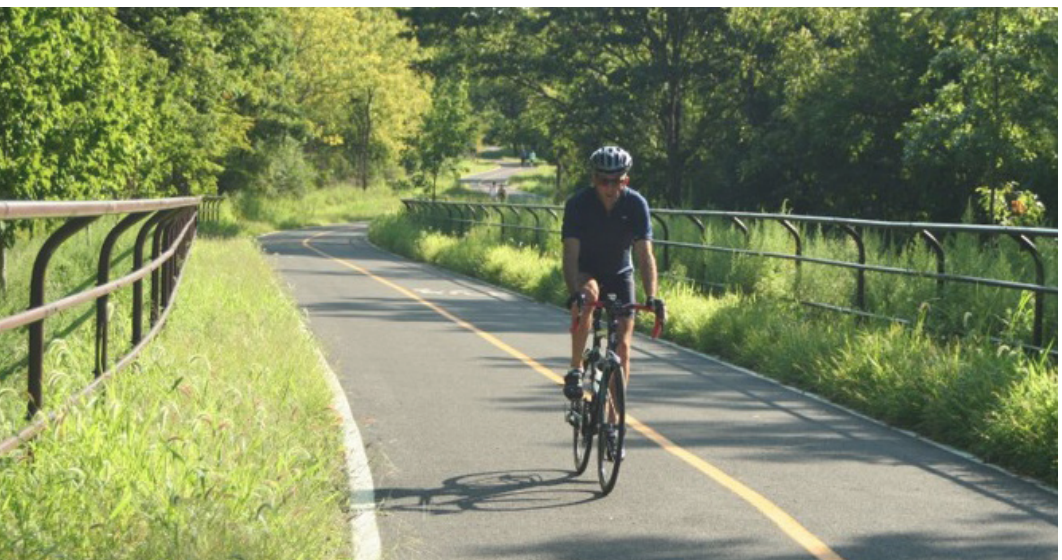




CHAPTER 1 > EXECUTIVE SUMMARY

VISION

American cities and towns were once planned and designed around a balanced mix of transportation modes – walking, biking, horses and eventually the automobile. Towns that have preserved this balance as they grew are now some of the most desirable places to live, work, and visit. The shift to an auto-centric network was defined by separate areas within a community for living, working, commerce, and recreation that required a car trip to access each. This shift was characterized by roads whose function were judged on the volume and speed of the cars it carried. Cities like Concord are committed to moving back to a more balanced community transportation network that values connectivity, safety, and health as well as serving the needs of businesses and institutions.

This plan is the result of Concord's desire to make safe, accessible walking and biking part of the City's identity. There is consistent support across the community to invest biking and walking infrastructure to create a city with a well connected greenway network, multi-use paths along roadways, enhanced sidewalks, and safe roadway crossings. This infrastructure will create an intuitive, safe network that is attractive to users of all ages and abilities. Residents from ages eight to 80 will use the Concord bicycle and pedestrian network as a viable option for short trips, for exercise, to connect with nature, and commuting. Visitors will select Concord because of its vibrant greenway network and walkable downtown and neighborhoods. New businesses and employers will choose to invest in Concord because of a high quality life and sense of place that attracts a wide variety of potential employees.

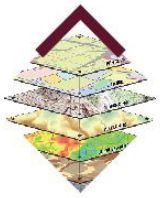
PURPOSE + PROJECT OVERVIEW

The purpose of this study is to identify feasible, constructible bicycle and pedestrian routes along stream corridors, through open spaces, and along roads to create a more connected Concord. The City of Concord elected to prepare an open space connectivity analysis, expanding upon the Greenway Master Plan included in the Parks and Recreation Master Plan as adopted by City Council in January 2017. This study is a tool that City Staff can use as a guide to approve, plan, and ultimately build the facilities needed to connect residents and guests of Concord.

PROCESS



listen
- community vision
- user experience
- design aesthetic
- maintenance
- budget



data collection
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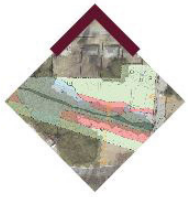
- land use
- easements
- roadway
- streams
- floodplain
- existing plans
- topography



analysis
- network analysis
- property acquisition
- construction costs
- schedule
- maintenance costs
- constructibility
- stream project coordination



implementation
- escalated cost estimates
- property acquisition strategy
- permitting strategy
- funding strategy
- tourism + operations

Figure 1 - The Planning Process

The Open Space and Connectivity Analysis began with an intensive Listening phase to develop a detailed understanding of how residents want to move and where they want to go. This phase also included specific work across many City Departments to create a coordinated approach to creating a connected, safe network.

The Analysis phase of the project examined the overall network, priority greenway corridors, and small detail areas. The network analysis resulted in a plan that connects desired locations with a mix of greenways along stream corridors, multi-use paths along roadways, and improvements to sidewalks and bike lanes. Corridor studies were completed on priority greenway corridors to support budgeting, land acquisition, and grant seeking. Detailed small plan study areas were established that contained a high number of desired destinations. These recommendations focus on sidewalk and roadway crossings that support biking and walking within these areas of Concord.

The master planning process is one of transparency, community engagement, and data driven recommendations developed through an analytical need-based approach. From the initial inventory and analysis through the implementation plan, the project team engaged the community, stakeholders, and Department staff, while researching pedestrian and bicycle trends and understanding the City's demographics. The project team investigated each proposed corridor and small plan study area to determine ideal alignment of trails, location of supplemental facilities, as well as constraints that will need to be overcome.

Finally, the project team, in conjunction with Department staff, developed and prioritized recommendations to improve the pedestrian and bicycle facility offerings for a fifteen (15) year planning horizon.

The study includes:

- Existing conditions evaluation
- Identification of opportunities and constraints
- Trail alignment, trail surfacing, and access point recommendations
- Identification of opportunities for new passive open spaces along recommended trail alignments
- Potential acquisition opportunities
- Identification of connection opportunities with roads, sidewalks, bicycle routes, and neighborhoods and business hubs
- Development of preliminary design and cost estimates
- Creation of an achievable plan with prioritized phasing

The vision is to achieve a connected multi-modal transportation system that provides convenient and safe access to jobs and schools, retail centers and services, and dining and entertainment destinations for pedestrians and bicyclists and to expand the current greenway system to bring further recreational opportunities to residents and guests. Concord's vision is to be bold and impactful; to maximize the City's mobility and connectivity while protecting environmental assets.

PROJECT ADVISORY COMMITTEE AND STAKEHOLDERS

This plan could not have been completed without the assistance and input from the following:

- Mayor William C. "Bill" Dusch
- Lloyd Payne – City Manager
- Brian Hiatt – Previous City Manager
- Merl Hamilton – Previous Deputy City Manager
- Concord City Council
- City Departments
- Parks and Recreation
- Transportation
- Planning and Community Development
- Engineering
- Buildings and Grounds
- Water Resources
- Connectivity Committee
- City of Concord Residents

GOALS + OBJECTIVES

GOALS

This plan strives to assist and augment the City's vision by:

- Enabling the City to achieve their vision of a connected pedestrian and bicycle transportation network by identifying feasible, constructible routes and presenting information that contributes to well-informed development and infrastructure decision making.
- Establishing specific connectivity recommendations with 5, 10, and 15-year priority.
- Creating an implementation strategy that aims to reduce vehicular congestion for locals by providing desirable pedestrian and bicycle connections to safely move users to desired destinations.
- Providing recommendations to construct a multi-modal transportation system that augments tourism efforts, giving visitors more opportunity to explore and experience Concord.
- Conveying recommendations to aid in communication, coordination, collaboration, and prioritization of planning efforts and initiatives that fill the gaps to avoid transportation silos.
- Developing standard language recommendations to include in Concord's Development Ordinance that preserves land required to provide pedestrian and bicycle connections.
- Informing development and infrastructure investment decisions that support the City's vision of an integrated and connected multi-modal transportation system.

OBJECTIVES

In order to achieve the goals, set forth by this connectivity analysis, the design team identified the following objectives:

- Utilize previous planning efforts and precedent studies to draw inspiration and obtain the history of planning efforts regarding connectivity proposals.
- Recommend possible trail alignments.
- Seek opportunities to create small area trail loops, such as the Four Mile Downtown Greenway Loop.
- Recommend trail surfacing and access points.
- Identify opportunities for new open spaces along the trail alignments.
- Identify potential acquisition opportunities.
- Develop preliminary design and cost estimates.
- Create an achievable plan with prioritized phasing.
- Provide recommendations that support desired infrastructure and economic development as well as environmental needs and requests.
- Foster a healthy community by providing resources that aid in the development of recreational opportunities and access to open space.

WHY GREENWAYS, TRAILS AND BIKE FACILITIES?

Greenways are corridors of land recognized for their ability to connect people and places, working as a tool for transportation, economic development, environmental preservation and leisure activities.[1] Users of greenways vary by location and intended use: pedestrian commuters, cyclists, and even skaters. Typically located in narrow strips of land where other uses are prohibited, greenways are often situated in a flood plain or between developments of differing land uses, being utilized as buffers by separating and protecting the natural environment from the built environment. Fragmentation of open space resulting from land development can be resolved by using greenways to provide buffers and wildlife corridors. As a result, recreational opportunities are presented to a broad range of users who reside in the areas adjacent to greenways due to the often elongated, linear expanses of connections.

Greenways, trails, and bike facilities benefit a community in numerous ways. When created as a system, the impacts on the community become greater due to the expanse of benefits distributed across a large contiguous area.

Benefits achievable from a connected network include:

- Enhanced health and well-being:
- Access to facilities for active living and connecting with nature
- Environmental Stewardship:
- Support clean air, rivers and preserve habitat; mitigate flooding
- Catalyst for Economic Impacts:
- Attract talent and business through public investment
- Increase Mobility Options:
- Creates non-vehicular trip options
- Enhance cultural awareness and define community identity through aesthetic contributions
- Education Opportunities:
- Teach children and adults about the natural world



Figure 2 - Greenway Trail Benefits

1 https://www.americantrails.org/images/documents/TN-trail-ada.pdf

PUBLIC PROCESS OVERVIEW

The public process began with interviewing City of Concord Leadership and Staff. These groups are crucial stakeholders in the development of this connectivity analysis, as they will be tasked with making the vision of a more walkable, and interconnected community a reality.

Following the meeting with Parks and Recreation Staff, other City departments were engaged in the process to ascertain each department's relationship and responsibility regarding bicycle and pedestrian facilities. Departments that were interviewed and topics of discussion included:

TRANSPORTATION

- Pedestrian Improvement Program
- Road Resurfacing
- Cabarrus/Rowan Metropolitan Planning Organization (MPO)
- Current or Planned State Transportation Improvement Program (STIP) Projects
- Status of Bike Share

PLANNING

- Concord Development Ordinance (CDO) and Bike/Pedestrian Facilities
- Opinion of Developer Built/Funded Trails

ENGINEERING

- Design Oversight Process (regarding greenways)
- Project Delivery Process
- Construction Administration Process

BUILDING AND GROUNDS

- Maintenance
- Budget
- Equipment

WATER RESOURCES

- Planned or Potential Stream Restoration Projects

The team also met with City leadership at the onset of the project. Interacting with the Mayor, City Council and other elected officials was an important moment in the process. They have the best interests of Concord residents in mind and their insight is a valuable contribution to the plan.

Leadership reinforced the vision of being able to get anywhere within the city via foot or bicycle. Connectivity is key and leadership spoke specifically about their desire to connect to neighborhoods, greenways, parks, and retail centers. They also spoke about opportunities Concord has to connect to other municipalities in the Charlotte region. Concord wants to be a walkable city, a progressive city, a city where people want to live.

While connectivity is a priority of Council, we must recognize that Council has multiple priorities. There is much support from City leadership, and they encouraged the team to be bold and impactful in their recommendations.

Bringing the public input to a close, two public input workshops were held to solicit feedback on the needs and wants of the community. The public workshops engaged residents at the beginning of the planning process as a series of drop in open houses with the intention of reaching a wider geographic range of City residents. Both workshops were structured identically to provide a consistent feedback mechanism.

THE CITYWIDE OPEN SPACE CONNECTIVITY NETWORK

The proposed open space connectivity network traverses through differing development densities and connects various destinations City-wide through a series of connected greenway trails, side paths, and expanded bike and sidewalk facilities and intends to:

- Provide easily accessible connections to destinations.
- Provide facilities that safely accommodate multiple user types.
- Provide access to the greenway trail system from the street network.

Within the document, the open space connectivity network has been presented through various scales and levels of detail. First are the detailed greenway corridor studies where cut sheets are provided to set up priority greenway corridors for future implementation. The detailed greenway corridors were selected based on public input priority corridors and Staff recommendations.

Cut Sheets include:

- Detailed segment map which identifies streams and wetlands, roads, neighborhoods, schools, parks, and existing pedestrian/bicycle facilities as well as adjacent greenway projects.
- Recommendations for location of physical elements within the segment (e.g. trail alignment, pedestrian bridges and underpasses, crosswalks, and trailhead/ parking locations).
- Routing challenges and opportunities (e.g. topography, stream crossings, floodplain impacts, observed wetlands, and road crossings)
- General description of segment
- Key destinations and activity hubs (trail trip generators)
- Previous planning efforts
- Potential Right-of-Way Needs
- Potential Permitting Needs
- Estimated Project Cost
- Potential Funding Sources

Second are small plan study areas that explore a finer grained planning analysis of a larger area, highlighting key destinations and activity hubs to clearly show the connectivity thorough the system. The small plan study area boundaries were derived from input received during the public input process. These areas contained the most desired pedestrian/ bicycle travel destinations. During the process, it was determined that diving into smaller scaled planning areas would offer a greater understanding and projection of proposed connections between existing/proposed pedestrian and bicycle facilities and to existing/proposed destinations (e.g. schools, parks, commercial centers, etc.). The small plan study areas also identify opportunities for key open spaces along trail corridors.

Lastly is the completion of the connectivity network. The existing greenway trails, sidewalks, and bicycle facilities are important to the City's transportation system and expanding that infrastructure to include additional greenway and multi-use corridors will help satisfy an unmet need by providing a more pedestrian and bicycle opportunities.

IMPLEMENTATION STRATEGY

While the network plan provides an overall framework for development of various types of trails and the approximate routes, it is by no means construction-ready. As a living document, the network plan and priorities may evolve with changing development pressures, funding opportunities, and demographic trends. Further, the County will need to undertake more detailed corridor and feasibility studies to "ground-proof" each trail corridor. This typically includes a detailed evaluation of land / easement acquisition potential, topography, stream or road crossings, grading and drainage patterns, safety, user experience, long-term maintenance, and regulatory requirements. With this more detailed layer of information, detailed design decisions such as trail surface and profile, width, markings, signage, furnishings, and crossings can be finalized. Only after this detailed assessment can a final trail alignment be determined. The below diagram illustrates a typical greenway planning, design and construction process with key phases and individual tasks. Next steps will be for the City to undertake individual Corridor Studies followed by Feasibility Studies and finally, Project Design.

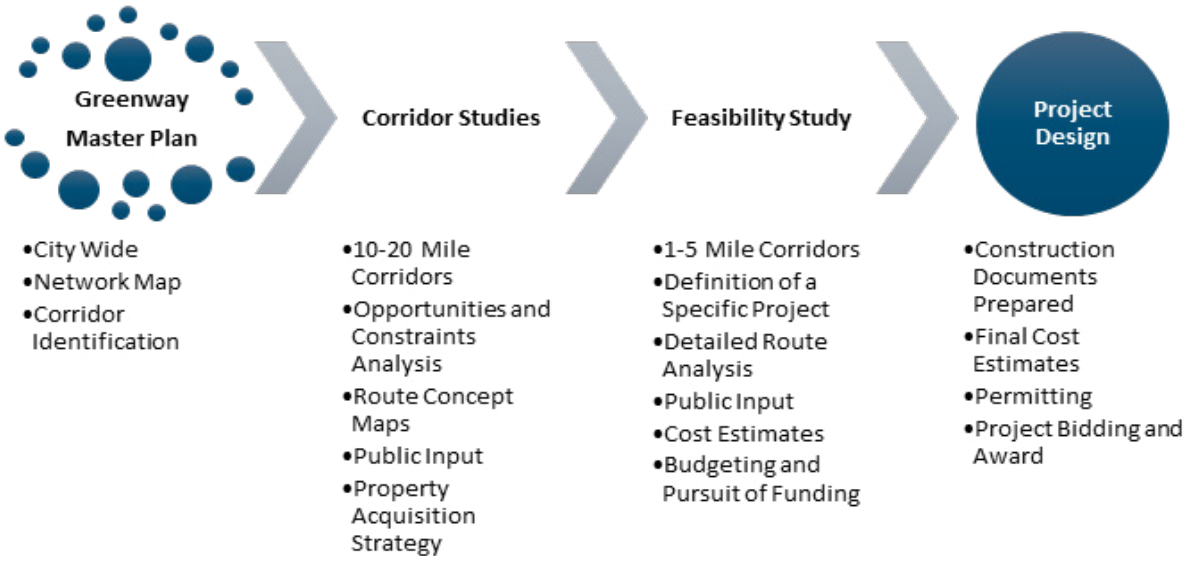


Figure 3 - Greenway trail planning, design and construction process and sequencing.

Successful implementation of the bicycle and pedestrian connectivity plan will require a coordinated effort of many parties working together. These agencies include County and City departments as well as NCDOT and Federal Affiliations. Private sector organizations may also prove beneficial, as they may have the influence and capacity to garner additional community support for establishment of the bicycle/ pedestrian network.

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2 introduction





CHAPTER 2 > INTRODUCTION

American cities and towns were once planned and designed around a balanced mix of transportation modes – walking, biking, horses and eventually the automobile. Towns that have preserved this balance as they grew are now some of the most desirable places to live, work, and visit. The shift to an auto-centric network was defined by separate areas within a community for living, working, commerce, and recreation that required a car trip to access each. This shift was characterized by roads whose function were judged on the volume and speed of the cars it carried. Cities like Concord are committed to moving back to a more balanced community transportation network that values connectivity, safety, and health as well as serving the needs of businesses and institutions.

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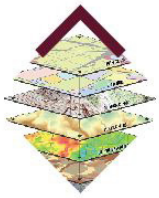

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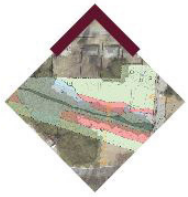

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- Mayor William C. "Bill" Dusch
- Lloyd Payne – *City Manager*
- Brian Hiatt – *Previous City Manager*
- Merl Hamilton – *Previous Deputy City Manager*
- **Concord City Council**
  - Samuel Leder – District 1
  - W. Brian King – District 2
  - Ella Mae Small – District 3
  - JC McKenzie – District 4
  - Terry Crawford – District 5
  - Jennifer Parsley – District 6
  - John Sweat, Jr. – District 7
- **Parks and Recreation**
  - Bob Dowless - Director
  - Mark Kincaid – Deputy Director
  - Jason Pauling – Senior Planner
  - Greg Haverlock – Recreation Coordinator
  - Debbie Littlefield – Program Coordinator
  - Sheila Lowry – Executive Assistant
- **Transportation:** Phillip Graham - Director
- **Planning and Community Development**
  - Steve Osborne –Planning Director
  - Margaret Pearson – Previous Planning Director
- **Engineering:** Sue Hyde - Director
- **Buildings and Grounds:** Susan Sessler - Director
- **Water Resources:** Jeff Corley – Deputy Director
- **Connectivity Committee**
  - Steve Osborne – Planning and Community Development – Director
  - Scott Sherrill – Planning and Community Development – Senior Planner
  - Julian Burton – Planning and Community Development – Development Review Administrator
  - Mark Kincaid – Parks and Recreation - Deputy Director
  - Jason Pauling – Parks and Recreation - Senior Planner
  - Phillip Graham – Transportation – Director
  - Devon Huston – Transportation – Deputy Transportation Director
  - Brielle Hartney – Transportation – GIS Coordinator
  - Rick Blat – Engineering – Deputy City Engineer
  - Jeff Corley – Stormwater Services – Deputy Director
  - Andy Christy – Rider Transit – Transit Planner and Technology Coordinator
- **City of Concord Residents**

GOALS + OBJECTIVES

GOALS

This plan strives to assist and augment the City's vision by:

- Enabling the City to achieve their vision of a connected pedestrian and bicycle transportation network by identifying feasible, constructible routes and presenting information that contributes to well-informed development and infrastructure decision making.
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CRITICAL ISSUES

While there is growing support for biking and walking infrastructure there is still a need to clearly articulate the return on investment for these facilities. Some of the critical issues that surround development of these systems are the use of tax dollars to construct facilities and their perceived lack of safety. This plan seeks to provide information that will help City staff and elected officials continue to educate the community with well researched and supported data.

Other critical issues that accompany the development of interconnected pedestrian and bicycle systems include elements that are more site and/or construction related.

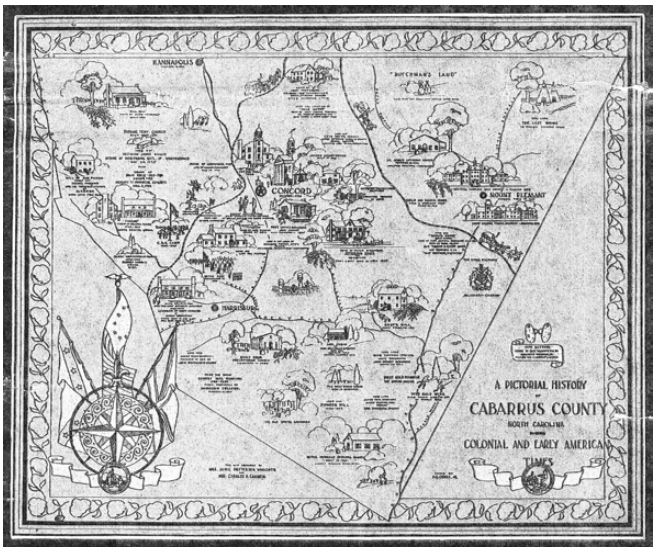
These include environmental, land division/ ownership, and trail alignment challenges (and opportunities) such as:

- Stream crossings
- Difficult grades
- At-grade road crossings
- Crossing beneath bridges
- Observed wetlands
- Natural areas to be avoided
- Opportunities for coordination with stream restoration projects
- Relationship to adjacent property uses
- Utility corridors
- Maintenance of constructed facilities

REGIONAL + LOCAL IDENTITY

HISTORY

Catawba Indians originally inhabited present day Cabarrus County when significant numbers of Dutch, Scotch-Irish, German, and Welsh-English families began traveling the Great Wagon Road to the North Carolina backcountry in the middle of the eighteenth century. Following the County's formation in 1792, location of the new county seat was fervently discussed and debated. To resolve the dispute, Stephen Cabarrus, the County's namesake, pleaded with the citizens to set aside their differences and to have "concord." Consequently, a site was selected, and appropriately named "Concord." And the primary street in Concord was named "Union" to reflect the spirit in which the issue was settled. The Town of Concord was established in February 1796 and was laid out on a 26-acre tract of land lying on a ridge near the old Indian Trading Path and to the west of Three Mile Branch. In 1837, Concord was incorporated with a total land area of one square mile.



Industry began in Concord with the organization of the first cotton mill in 1839 (positioned north of town which is now the site of Locke Mill Plaza). As county seat and with the completion of the North Carolina Railroad on the west side of town, Concord became a center of trade and retail for the cotton-producing region. With cotton as a commodity crop and through textile manufacturing, Concord became a site of industrialization in the late 19th century. In 1877, Concord Cotton Factory was bought by Captain J.M. Odell and by 1890 that mill, along with several others Odell built, made Concord the most successful mill town in North Carolina. Concord's Coleman Manufacturing Company, which operated from 1896 till 1904, was the nation's first textile company owned and operated by African Americans.

With the success of the great mills, no city in North Carolina had more energy and excitement than Concord in 1890. The town's population had more than doubled from 1600 persons in 1880 to 4,000 persons by 1890. By 1900, Concord's population swelled to 8,000 persons. By the turn of the 20th Century, the textile industry had transformed the once agrarian town into a bustling and growing industrial center.

The city continued its steady growth, its population increased to to 8,715 in 1910 and then a decade later, to 9,903. By 1936, 13,500 people called Concord home. The greatest period of growth was in 1985 when Concord had a population of about 18,000 persons. At the end of the 20th Century, Concord's economic base began the shift from textiles to a combination of industrial, commercial, governmental and health-related commerce and grew to a population of over 85,000 people as of 2017. Concord is the second largest city in the Charlotte-metro area and the eleventh largest in North Carolina.

Although it enjoys many of the advantages of small-town lifestyle, Concord continues to be a progressive community. The Concord of Today boasts a brilliant mixture of progress and heritage and a wonderful blend of business, industrial, and residential life. With such a balance, one can see that Concord still embodies the original meaning of its name: "harmony."







GEOGRAPHIC PROFILE

Located in western Cabarrus County in the Piedmont region of North Carolina and in the rapidly growing NE quadrant of the Charlotte-metro area, the City of Concord is situated within the fast-growing Charlotte metropolitan area. Concord is near Uptown Charlotte as well as other regional employment, shopping and entertainment centers. Concord's rapid growth is in relation to the increase in commercial and industrial sectors. To meet this growth, the city provides recreational, education, entertainment, and cultural opportunities.

Interstate 85 creates the majority of the City's northern border, making Concord easily accessible. Interstate 485 to the southwest provides links throughout the metropolitan region and improved connection to the I-77 corridor; a key route to northern and mid-west states as well as to central Charlotte, Rock Hill, and Columbia.

DEMOGRAPHICS & GROWTH

This demographic analysis describes the population within the City of Concord, North Carolina. This analysis is reflective of the City's total population and its key characteristics such as age segments, income levels, race, and ethnicity. Existing demographics and projected growth were analyzed to enable the planning team in understanding the local community and recommend desired direction for open space connectivity.

It is important to note that future projections are based on historical patterns and unforeseen circumstances during or after the time of the analysis could have a significant bearing on the validity of projected figures.

METHODOLOGY

Demographic data used for the analysis was acquired from the Environmental Systems Research Institute, Inc. (ESRI), the largest research and development organization dedicated to Geographical Information Systems (GIS) and specializes in population projections and market trends. All data was acquired in December 2018 and reflects actual numbers as reported in the 2010 Census and estimates for 2018 as obtained by ESRI. Straight line linear regression was utilized for 2025, and 2035 projections. Concord city limits as shown below was utilized for the demographic analysis.

TOTAL POPULATION

Concord's population has experienced steady growth between 2010 and 2018. While the total population grew, the average annual growth rate maintained a 2% growth, which is well above the national growth rate of 0.87% annually over the same period. Currently, the population is estimated at 92,952 people living within 34,444 households.

Projecting ahead, the total population and total number of households are both expected to grow. But population growth rate is expected to top out in 2025 at 2.8%. Household growth rate, however, stays consistent at 2.0%. Based on 2035 predictions, the City is expected to have 141,561 residents living within 48,393 households.

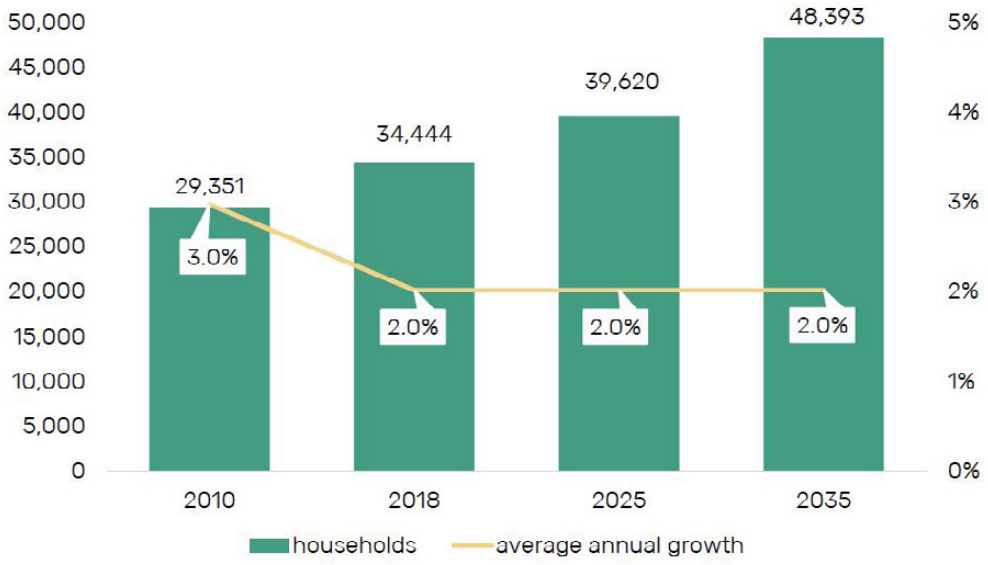


Figure 2 - Total Population and Average Annual Growth Rate for Concord

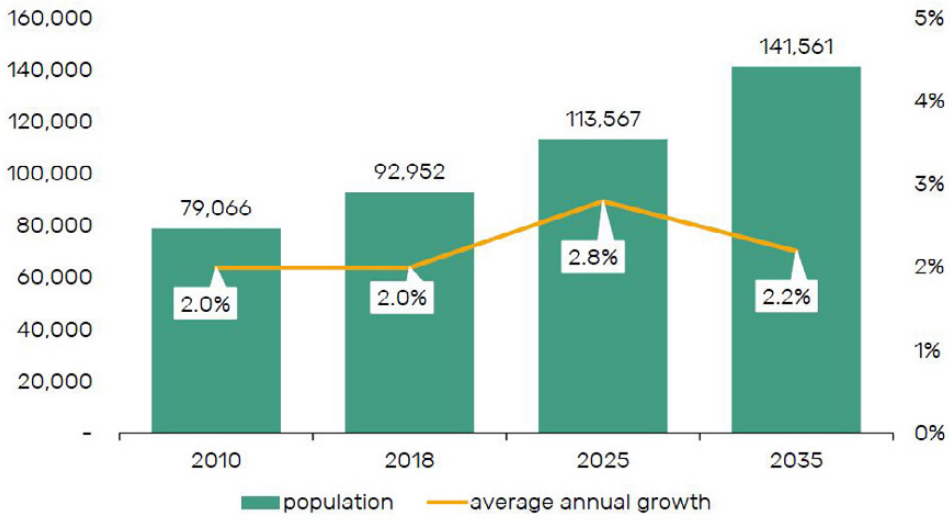


Figure 3 - Total Population and Average Annual Growth Rate for Concord

AGE SEGMENT

The 2018 age distribution of Concord indicates that the largest age group as the 35-54 and the second largest group is 17 years and younger. The bulk of the population age segmentation rests under 55 years, which would suggest that most residents are comprised of households with children. However, as we move toward 2035, the 54 and under age segments remain relatively the same whereas the senior groups (55-74 and 75+) slightly increase.

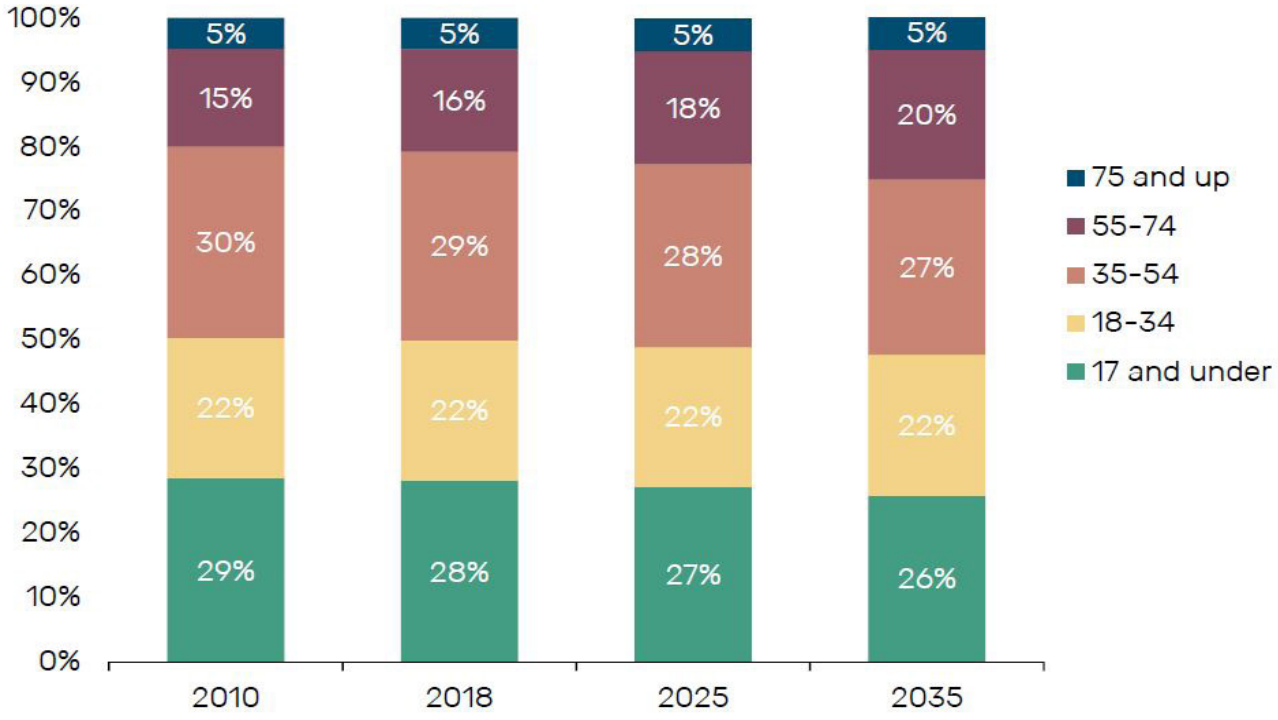


Figure 4 - Population by Age Segment

RACE AND ETHNICITY DEFINITIONS

The minimum categories for data on race and ethnicity for Federal statistics, program administrative reporting, and civil rights compliance reporting are defined as below. The Census 2010 data on race are not directly comparable with data from the 2000 Census and earlier censuses; therefore, caution must be used when interpreting changes in the racial composition of the US population over time. The latest (Census 2010) definitions and nomenclature are used within this analysis.

American Indian

- This includes a person having origins in any of the original peoples of North and South America (including Central America), and who maintains tribal affiliation or community attachment

Asian

- This includes a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam

Black

- This includes a person having origins in any of the black racial groups of Africa

Native Hawaiian or Other Pacific Islander

- This includes a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands

White

- This includes a person having origins in any of the original peoples of Europe, the Middle East, or North Africa

Hispanic or Latino

- This is an ethnic distinction, a subset of a race as defined by the Federal Government; this includes a person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin, regardless of race

PLEASE NOTE: *The Census Bureau defines race as a person's self-identification with one or more of the following social groups: White, Black or African American, Asian, American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, some other race, or a combination of these. While ethnicity is defined as whether a person is of Hispanic / Latino origin or not. For this reason, the Hispanic / Latino ethnicity is viewed separate from race throughout this demographic analysis.*

RACE

Analyzing race, the City's current population is moderately diverse. The 2018 estimate shows that 65% of the population falls into the White Alone category, while the Black Alone category (20%) represents the largest minority. The racial diversification of the County is slightly more diversified than the national population, which is approximately 70% White Alone and 12.8% Black Alone. The predictions for 2035 expect the population to change through 2035, with White Alone decreasing to 51% and all other races increasing from years past.

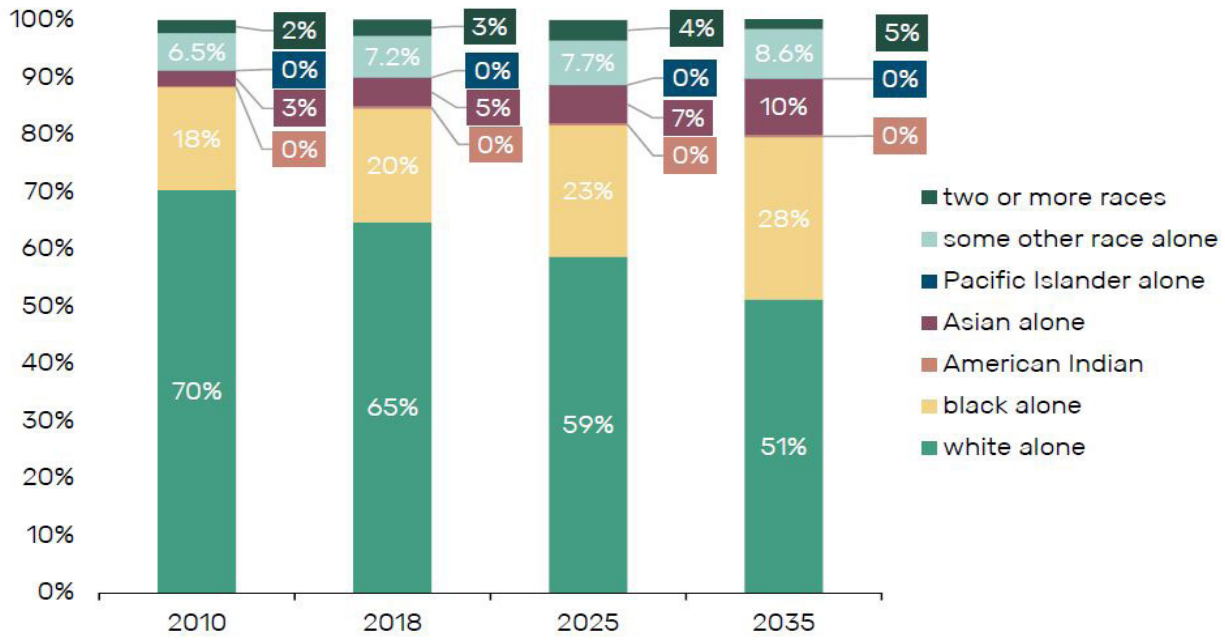


Figure 5 - Population by Race

ETHNICITY

The City's population was also assessed based on Hispanic / Latino ethnicity, which by the Census Bureau definition is viewed independently from race. It is important to note that individuals who are Hispanic/Latino in ethnicity can also identify with any of the racial categories from above. Based on the 2010 Census, those of Hispanic/ Latino origin represented 12% of the City's current population, which was lower than the national average of 16.3%. Current 2018 estimates show the Hispanic/ Latino population representing 14% of the population, which is also lower than national average (18.3%). The Hispanic/Latino population is expected to slightly increase through 2035, with an estimated 16% of the City's total population.

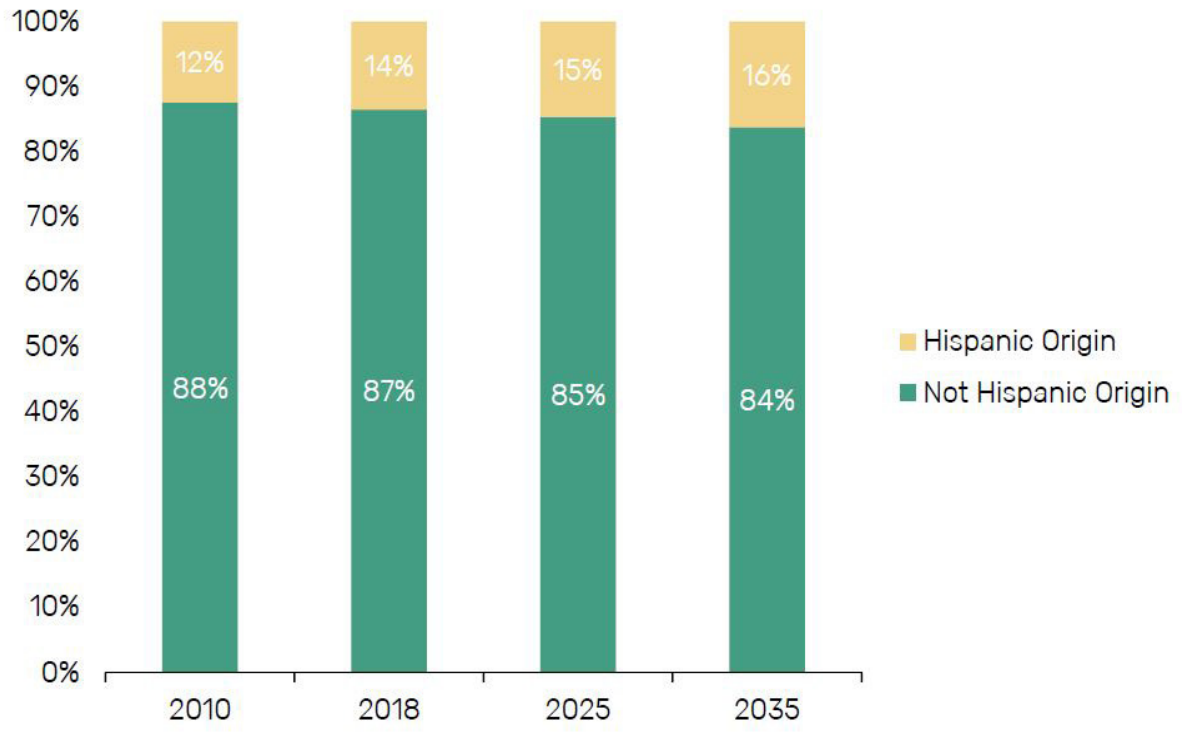


Figure 6 - Population by Hispanic Ethnicity

HOUSEHOLD INCOME

The socioeconomic status of Concord includes assessment of household income. The City's per capita income ($30,817) and median household income ($61,071) are both currently above the State's averages ($28,752 and $51,844) and national averages ($31,950 and $58,100).

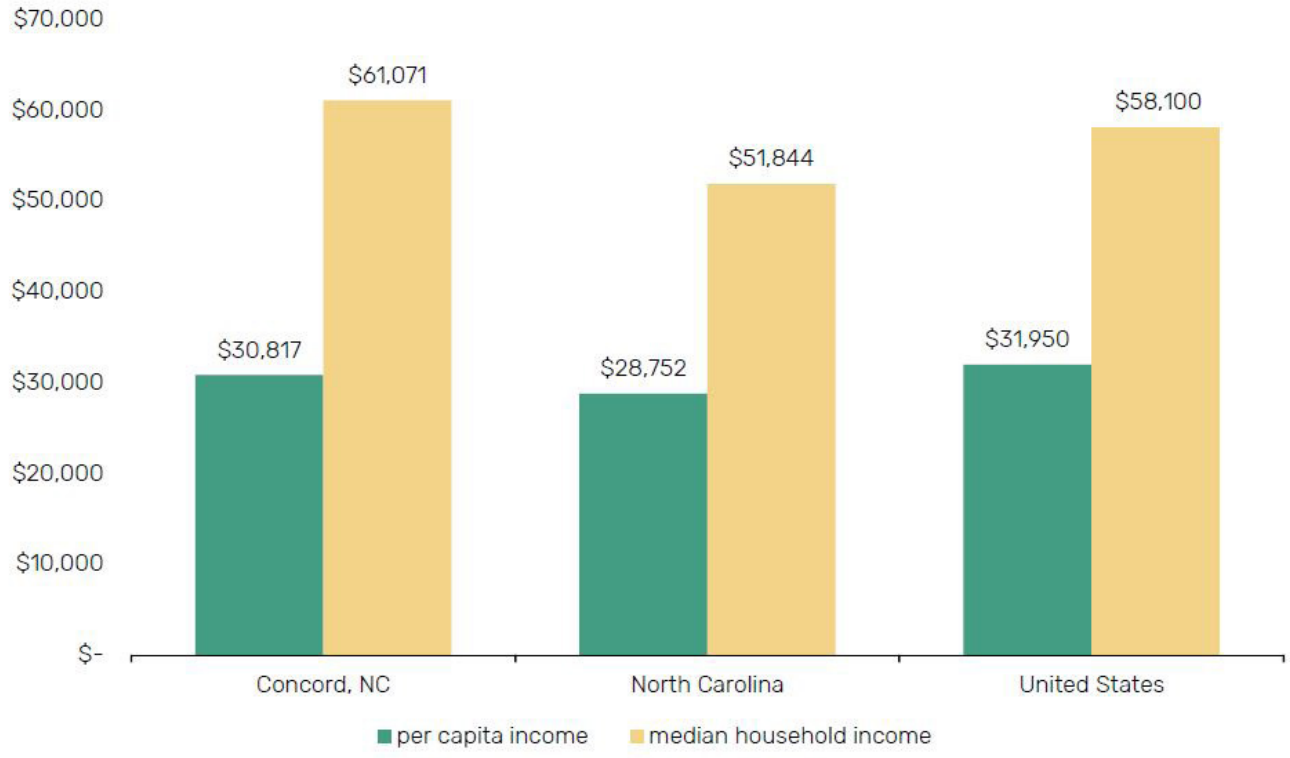


Figure 7 - Income Characteristics

DEMOGRAPHIC COMPARATIVE SUMMARY

The table below summarizes the City's demographic figures. These figures are then compared to North Carolina and the U.S. populations. The highlighted cells represent key takeaways from the comparison between Concord's demographic makeup and the national population.

2018 DEMOGRAPHIC COMPARISON		CONCORD	NORTH CAROLINA	U.S.A.
POPULATION	Annual Growth Rate (2010-2018)	2%	1.21%	0.86%
HOUSEHOLDS	Annual Growth Rate (2010-2018)	2%	1.14%	0.79%
AGE SEGMENT DISTRIBUTION	Ages 0-17	28%	22%	22%
	Ages 18-34	22%	23%	24%
	Ages 35-54	29%	26%	25%
	Ages 55-74	16%	23%	22%
	Ages 75+	5%	6%	7%
RACE DISTRIBUTION	White Alone	65%	66.4%	69.9%
	Black Alone	20%	21.7%	12.9%
	American Indian	0%	1.3%	1%
	Asian	5%	3%	5.7%
	Pacific Islander	0%	0.1%	0.2%
	Some other Race	7.2%	4.9%	6.9%
	Two or More Races	3%	2.6%	3.4%
HISPANIC/LATINO ETHNICITY	Hispanic / Latino Origin (any race)	14%	10%	18.3%
	All Others	87%	90%	82%
INCOME CHARACTERISTICS	Per Capita Income	$30,817	$28,752	$31,950
	Median Household Income	$61,071	$51,844	$58,100

Significantly higher than the National Average Significantly lower than the National Average

Figure 8 – Demographic Comparative Summary

KEY DEMOGRAPHIC FINDINGS

- The City's population annual growth rate (2.0 percent) and household annual growth rate (2.0 percent) are well above the national growth rate (0.86 percent and 0.79 percent, respectively) over the past 8 years (2010-2018). The State's figures, while lower than Concord, are closer to the City's growth percentage.
- The City's Black Alone race distribution (20 percent) is significantly higher than the national rate (12.9 percent) but only slightly lower than State's figures.
- The City's per capita income ($30,817) and the median household income ($61,071) are both higher than the national averages ($31,950 and $58,100). The per capita income is close to State figures, but median household income is significantly higher that figures for the State.

DEMOGRAPHIC IMPLICATIONS

While it is important not to generalize needs and priorities based solely on demographics, the analysis suggests some potential implications for the City.

Currently the short-term growth rate is increasing, however, in the long-term growth begins to fall. In order to address the fall in growth rate, the City should focus on providing more connectivity measures (greenways, sidewalk, bike lanes, etc.) now to ensure access opportunities for the growing population are considered. Then, as population growth decreases, it is important to focus on updating these facilities if the City is to continue enhancing its quality of life, while attracting new residents.

The City's average age distribution of 54 and under would indicate that growing and maintaining facilities which provide better connectivity is crucial for this demographic. This age group can rely heavily on these facilities to access work and school. It is also important to note that since the 55 and over age group grows over time, these facilities can provide more opportunity to lead a healthy, active, and social life for the senior population.

Lastly, the City's above-average income characteristics reveals presence of disposable income. This data suggests that dollars are available to spend for programs that would be associated with a more robust greenway system, expanding the offerings from what is currently available.

NATURAL RESOURCES & THE ENVIRONMENT

Located in the southern Piedmont region of North Carolina, Concord is positioned between two major river systems: the Catawba River to the west and the Yadkin/Pee Dee River to the east. The City is in the Rocky River Sub-basin of the Yadkin/Pee Dee River Basin, with Rocky River being the largest tributary.

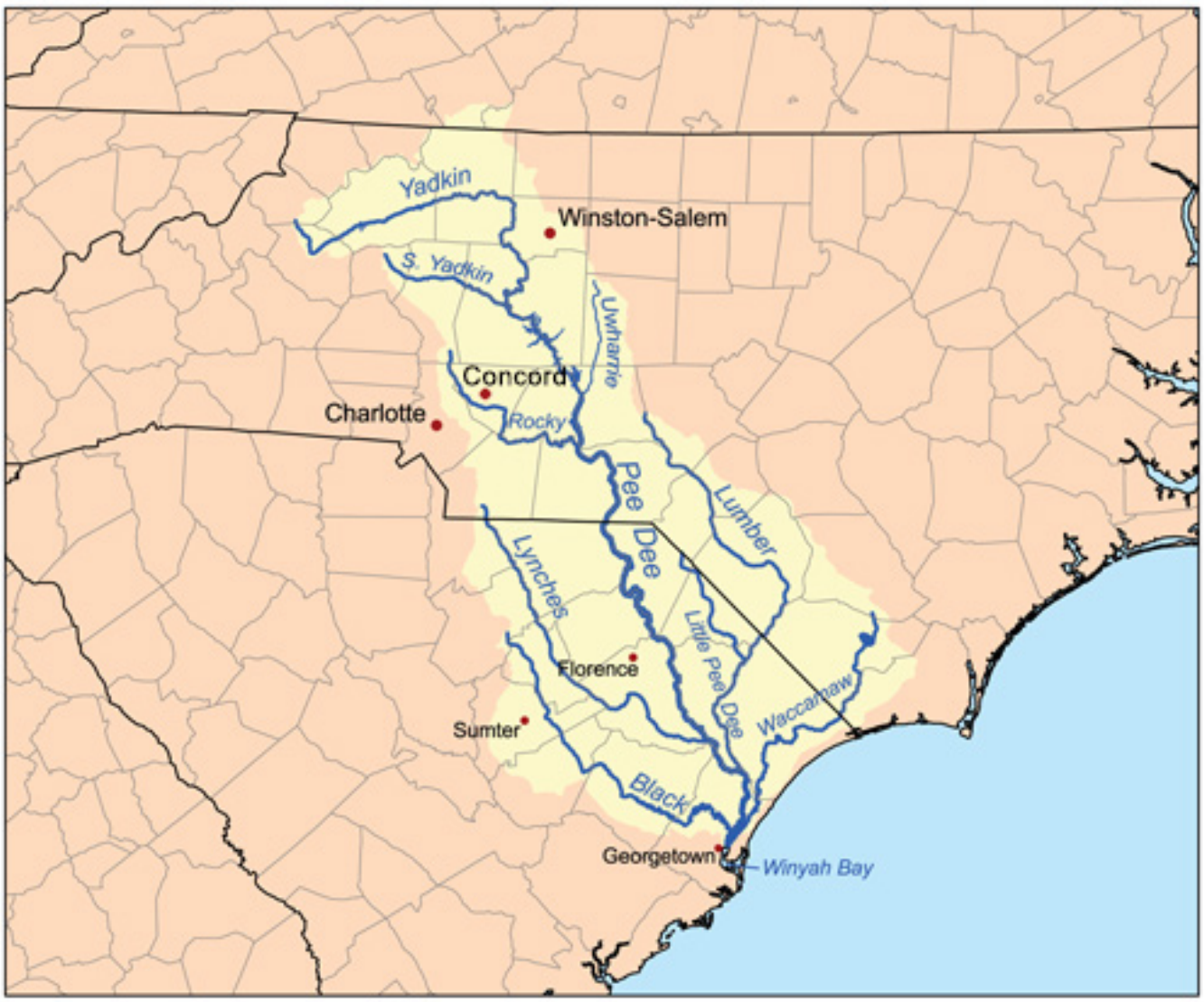


Figure 9 – Yadkin/Pee Dee River Basin

Rocky River, the largest stream in Concord, flows for almost 100 miles from its headwaters in Iredell County, through Concord, and ultimately to its confluence with the Pee Dee River. Rocky River lies in the western part of Concord, flowing from the northeast to southeast continuously throughout the year.

Five other major streams are part of the Rocky River watershed Coddle Creek, Irish Buffalo Creek, Cold Water Creek, Three Mile Branch, and Clarke Creek.

- Coddle Creek is a perennial stream fed by Lake Howell and flows in a southeasterly direction, emptying into Rocky River in the southern portion of the City.
- Irish Buffalo Creek is also a perennial stream, flowing from the western part of Kannapolis to the southeastern edge of Concord, draining into Rocky River near Concord's southern city limits.
- Cold Water Creek flows north to south from Lake Fisher in Kannapolis along Concord's eastern edge, emptying into Rocky River south of the city limits.
- A tributary of Cold Water Creek, Three Mile Branch, begins in the heart of Kannapolis where it travels south, entering Concord near the intersection of I-85 and US Highway 29. It then finds its way to NC Highway 3 travelling parallel to the highway until it drains into Cold Water Creek in the southeastern part of the City.
- Clarke Creek begins at the confluence of several smaller creeks in Huntersville just west of Skybrook Golf Club. It travels southeast, west of Cox Mill High and Elementary Schools and empties into Rocky River on the west side of the City.

Additionally, there are several smaller streams and water bodies such as Afton Run, Wolf Meadow Branch, and Stricker Branch, that feed into these five major water bodies.

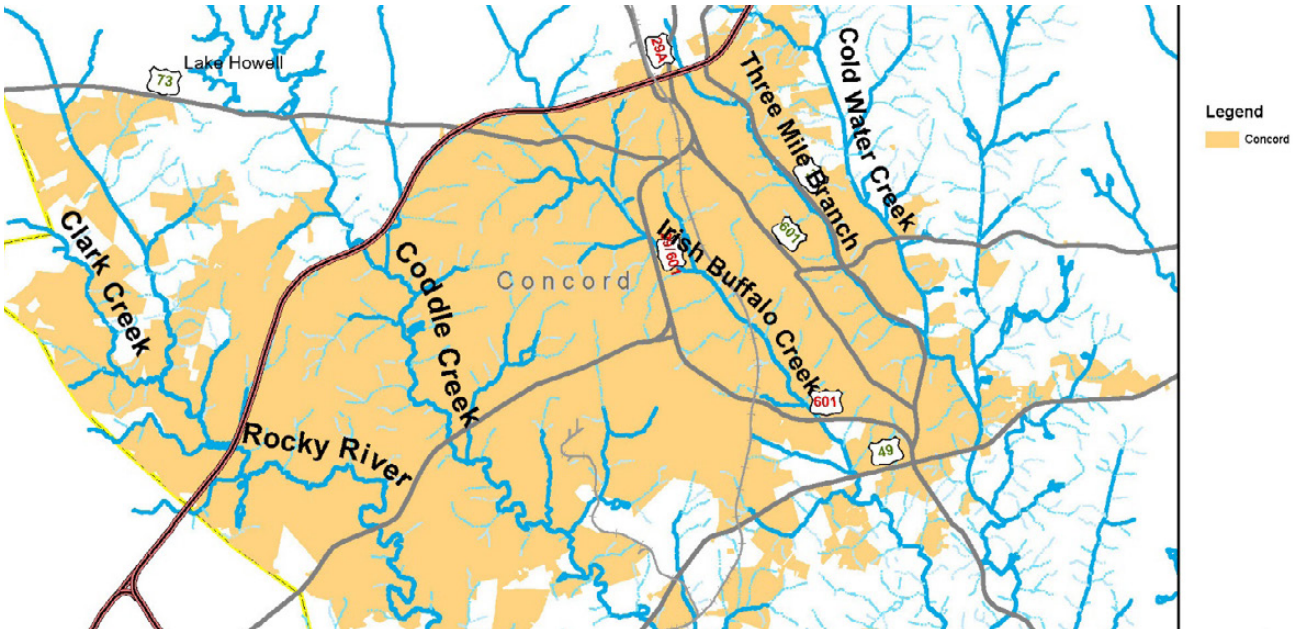


Figure 10 – Major Water Bodies in the Rocky River Watershed

These streams and creeks have carved out distinct upland areas of development, offering a unique opportunity to provide green, pedestrian corridors that traverse north-south through the City, creating a framework for a robust greenway system. With many streams in the watershed impacted or impaired, there is a great opportunity to provide much needed habitat preservation in a city whose development edges continue to expand. Severe bank erosion, channelization, and sedimentation are clear signs of impaired streams resulting in habitat degradation. Causes of habitat degradation typically originate in upland areas of the watershed by the combination of several stressors such as impervious surfaces, sedimentation, and erosion from construction, agriculture, and other land disturbing activities. With the Rocky River watershed comprised of naturally erodible soils, Concord streams are highly vulnerable to habitat degradation and care must be taken to protect these valuable corridors.

WHY GREENWAYS, TRAILS AND BIKE FACILITIES?

Greenways are corridors of land recognized for their ability to connect people and places, working as a tool for transportation, economic development, environmental preservation and leisure activities.[1] Users of greenways vary by location and intended use: pedestrian commuters, cyclists, and even skaters. Typically located in narrow strips of land where other uses are prohibited, greenways are often situated in a flood plain or between developments of differing land uses, being utilized as buffers by separating and protecting the natural environment from the built environment. Fragmentation of open space resulting from land development can be resolved by using greenways to provide buffers and wildlife corridors. As a result, recreational opportunities are presented to a broad range of users who reside in the areas adjacent to greenways due to the often elongated, linear expanses of connections.

Greenways, trails, and bike facilities benefit a community in numerous ways. When created as a system, the impacts on the community become greater due to the expanse of benefits distributed across a large contiguous area.

Benefits achievable from a connected network include:

- Enhanced health and well-being:
  - Access to facilities for active living and connecting with nature
- Environmental Stewardship:
  - Support clean air, rivers and preserve habitat; mitigate flooding
- Catalyst for Economic Impacts:
  - Attract talent and business through public investment
- Increase Mobility Options:
  - Creates non-vehicular trip options
- Enhance cultural awareness and define community identity through aesthetic contributions
- Education Opportunities:
  - Teach children and adults about the natural world



Figure 11 - Greenway Trail Benefits

1 https://www.americantrails.org/images/documents/TN-trail-ada.pdf

ENHANCED HEALTH + WELL-BEING

Simply being in nature and away from the stress of everyday life such as traffic, work environments, crowds, etc. enhance and promote an improved state of well-being. Greenways and trails promote a healthy, active lifestyle by providing a safe and attractive environment for physical and recreational opportunities such as walking, running, jogging, or biking.

Health benefits range from short to long-term effects in both physical and mental health. Trails and parks provide a safe environment for activity, and with long-term usage can improve cardiovascular health and reduce the chance of being diagnosed with cardiovascular, skeletal, and other potentially life-threatening ailments. [2] **Every $1 investment in trails for physical activity led to $2.94 in direct medical benefit.**[3] The sensitivity analyses indicated the ratios ranged from 1.65 to 13.40. Therefore, building trails is cost beneficial from a public health perspective.

In North Carolina 32.1% of adults and 15% of children are considered obese with these trends projected to increase. In 2017 11.4% or roughly 820,000 North Carolinians are considered diabetic. That number is projected to increase to over 1.2 million people by 2030. [4]At a cost of $9,601 per person per year, this largely preventable disease will have a profound impact on our economy and workforce. [5]

The American Diabetes Association cites walking as a powerful tool in the battle against diabetes. Walking can be done anywhere, but when communities invest in trail networks, walking becomes easier, safer and more fun and greenway trails do not have usage barriers like fitness center fees and equipment costs. Research has established that a modest 2 hours of walking per week lowers diabetes mortality[6]. Other greenway exercises such as running and cycling provide even greater reductions.

When utilizing greenway trails, users are more likely to interact with other members of the community, improving the social heath of the individual and overall social health of the community. This has proven to reduce stress and diminish depression while also promoting overall positive health outcomes.

Greenway trails also provide a critical opportunity to connect children with nature. Studies have shown that regular non-structured play in a natural setting reduced symptoms of ADHD[7]. Connecting with nature allows children and adults alike to release stress, engage in physical problem solving, and find space for contemplation and reflection.

2 https://www.cdc.gov/healthyplaces/parks_trails/default.htm

3 Wang Guijing., et.al, (2005). A Cost-benefit Analysis of Physical Activity Using Bike / Pedestrian Trails. Health Promotion Practice, 6 (2), 174-179. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/15855287.

4 https://stateofobesity.org/states/nc/

5 http://www.diabetes.org/advocacy/news-events/cost-of-diabetes.html

6 https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/215742

7 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1448497/

ENVIRONMENTAL IMPACTS

Greenway systems are often located along stream corridors, utility easements, and through natural habitat, and tend to coincide with the protection and enhancement of natural elements such as riparian buffers, wildlife habitats and functional ecosystems. Where development has resulted in fragmentation of habitats, greenways allow for wildlife to traverse the landscape with minimum human interaction and can utilize a broad area for food and water resources.

Greenways also create a "filter" between water bodies and development, filtering toxins and runoff from roads and development and reducing the amount entering the hydrologic system through biological methods. With the ability to reduce the velocity of water from rain events, greenways mitigate environmental degradation from erosion and sedimentation.

Greenways directly and indirectly purify the air, reducing the amount of fossil fuel exhaust and ozone being released into the atmosphere. Directly, the vegetation located within the greenway absorbs the pollutants and then releases oxygen back into the atmosphere. And indirectly, greenways encourage alternative methods of transportation resulting in a decrease of vehicles in the street infrastructure.

ECONOMIC IMPACTS

Comprehensive trail systems bring new business and economic life to cities, towns, and communities.[8] Regionally, The East Coast Greenway, an ongoing trail project with a goal to continuously connect Maine with Florida, benefits The Triangle area by bringing in over $90 million in related revenue and taxes per year and 800 temporary and permanent jobs.[9]

Greenways benefit the surrounding area on a micro-economic scale by increasing adjacent property values and enticing business transactions near trails. Not only does proximity to a greenway trail provide a strong selling-point, but adjacent home and property values statistically are higher than comparable properties further from greenways.

NCDOT recently completed a study on the impact of Shared Use Paths on local economies and concluded that every $1 invested in trail construction yields $1.72 annually from local business revenue, sales tax revenue and benefits related to health and transportation.

8 https://www.americantrails.org/resources/the-business-of-trails-a-compilation-of-economic-benefits

9 East Coast Greenway Alliance, The Impact of Greenways in the Triangle, (2017), 7.

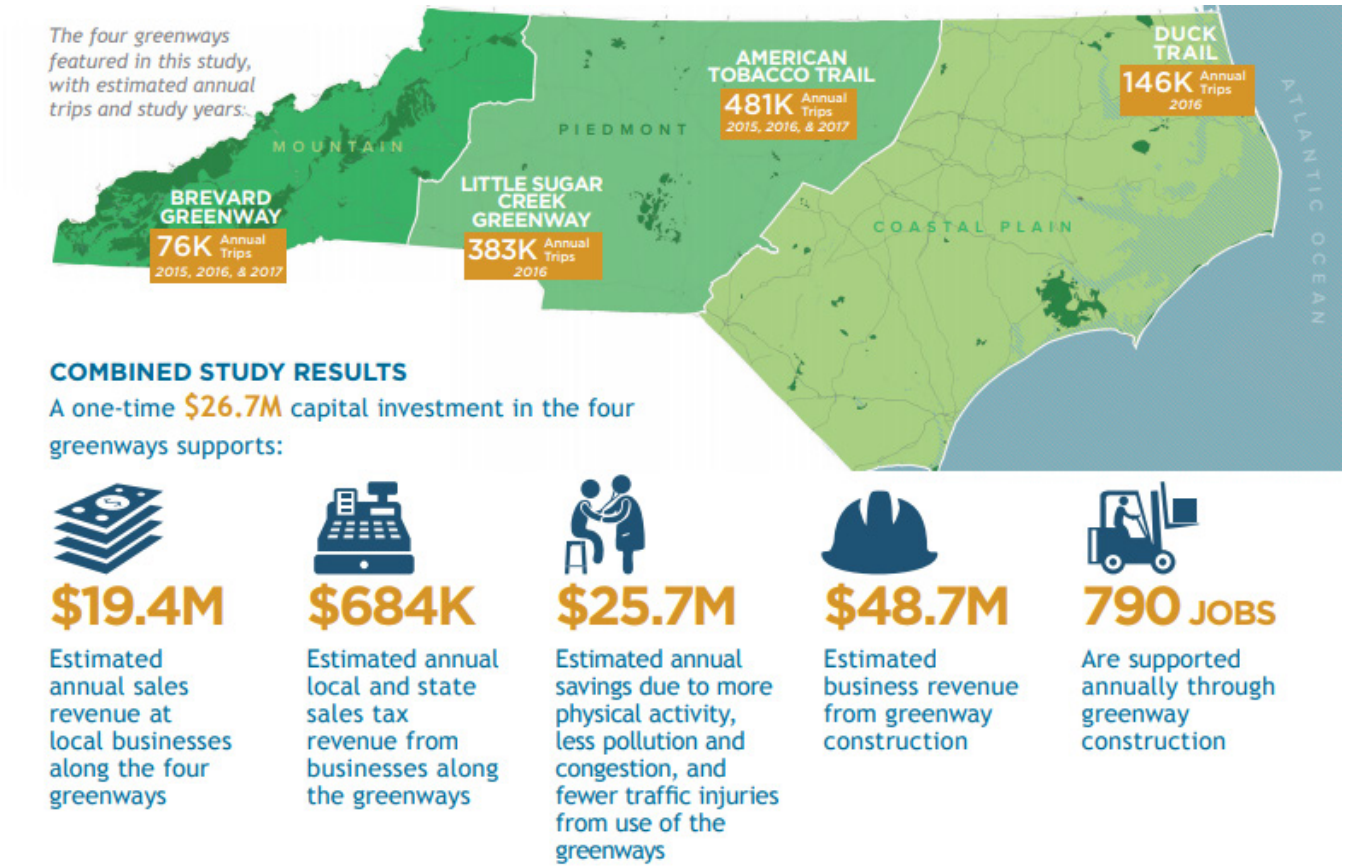


Figure 12 – Economic Impact of Shared Use Paths on Local Economies[10]

ALTERNATIVE FORMS OF TRANSPORTATION

Vehicular traffic congestion is often an issue, particularly in areas experiencing growth. Greenways can be used as a modest mitigation tool to remove vehicles from the congested roads. With paved trails requiring design compliance with "American Standard Specifications for making Buildings and Facilities Accessible to, and Usable by, the Physically Handicapped," greenway trails are made accessible for various forms of non-vehicular transportation from walking and running, to cycling and vehicle "disrupters" such as scooters and e-bikes. [11] Users of all ability levels and distances from destinations have the opportunity to utilize the greenway trails in ways that best suit their needs and goals.

Nationally, there were approximately 836,569 bike commuters in 2017 – an increase of 43% since 2000. [12] According to the United States Census Bureau, the average commute to work in 2017 required approximately 50 minutes per day. If this time were spent utilizing greenway trails in place of congested roads while being in the presence of the natural environment, the results would not only be revealed on the roads, but also in the overall health and wellness of the community. Trip reduction from biking and walking will come when the greenway network makes meaningful connections to schools, parks, large shopping districts, and employment centers.

10 https://itre.ncsu.edu/focus/bike-ped/sup-economic-impacts/
11 https://www.americantrails.org/images/documents/TN-trail-ada.pdf
12 https://bikeleague.org/sites/default/files/Where_We_Ride_2017_KM_0.pdf

ENHANCE CULTURAL AWARENESS AND DEFINE COMMUNITY IDENTITY + AESTHETIC CONTRIBUTION

People who live in rural areas often desire the space around them to be maintained to ensure a certain quality of life and preserve the historic and cultural perception of the area.[13] The protection of sacred places with lasting identities set years ago allows a community to maintain a sense of place for not only local residents, but for tourism and economic purposes.

Redevelopment of formerly neglected community resources with walking and biking infrastructure brings a new sense of identity, seen in projects such as at the American Tobacco Campus in Durham, North Carolina, the BeltLine in Atlanta, Georgia, and The High Line in New York City, New York. In all cases, industrial-uses prohibited public use until the installation of trails and active public/private destinations. Greenways are a catalyst for urban revitalization and restoration of economic vitality in derelict industrial centers. The incorporation of historic monumentation, interpretive signage and public art have the potential to capture and celebrate the past, enhancing cultural awareness, and connection to community identity.

Paired with economic benefits and community identity, greenways add and/or protect aesthetically pleasing aspects of a community. Not only is the natural environment portrayed in a raw state accessible to the public, but with the addition of artwork such as commissioned sculptures and murals are additional aesthetic achievements. This improves the experience for patrons and potentially attracts users who would not otherwise utilize a greenway trail system.

Typical Users

Two main user groups utilizing a trail network can be identified – recreational users and commuters. Those who use trails for recreational purposes walk, walk their pet, run and bike for sport / health. Their goals pertain to personal achievement, whether it is exercise or enjoying nature. Commuters use trails to traverse the landscape – they are destination oriented.



Figure 13 – Facility Protection

13 https://www.railstotrails.org/resourcehandler.ashx?id=4618

Trends in Bicycle & Pedestrian Planning & Design

The most significant trend in bicycle and pedestrian planning is the movement toward separated and protected bikeways vs. conventional bike facilities such as bike lanes. While a conventional bike lane created by a painted line that divides vehicles from cyclists is acceptable, it does not however, provide the safety and comfort of a separated and protected bike facility. Bike facilities removed from traffic by a curb, or row of parked cars, or a row of flexible posts at minimum, are preferred by most user types. The more physical separation a cycling facility provides, the more overall ridership levels grow, particularly among women, children, and seniors.

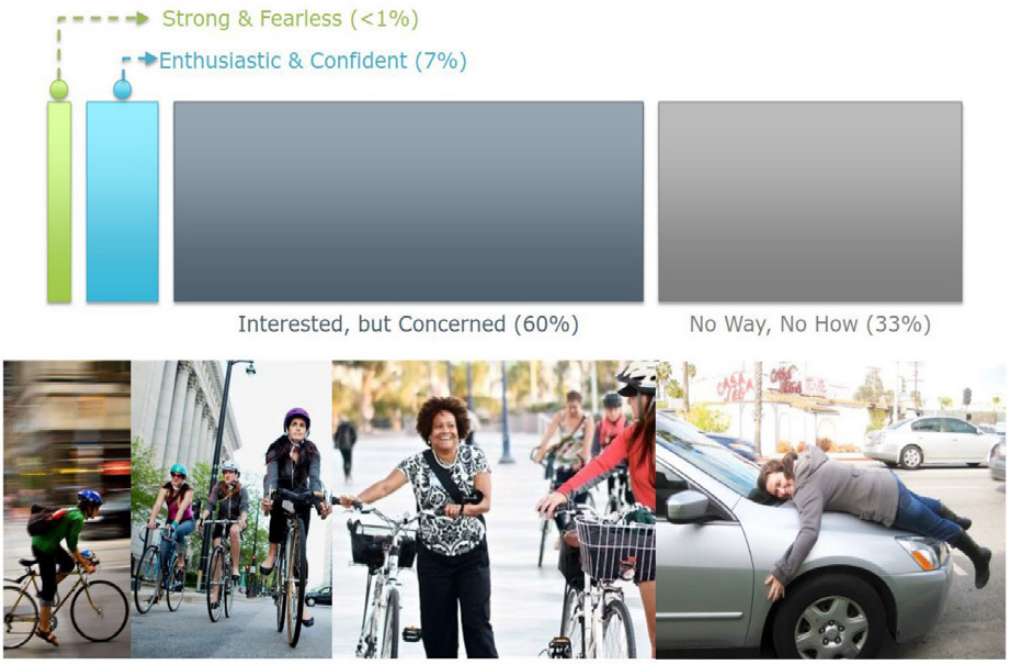


Figure 14 – Four Types of Cyclists

Research on bicycle facilities and ridership over the last several years have focused on the advantages of protected bike lanes, particularly the transformational effects they have on a place. Portland State University conducted a study in 2014 that determined separated bike paths are both undeniably safer for riders and that they attract new and/or out-of-practice riders to mount a bike. And in a paper published in the American Journal of Public Health, the authors of "Safer Cycling Through Improved Infrastructure," establish that cities whom have heavily invested in separated and protected bike paths have realized sizable safety improvements and increased ridership numbers. Safety and ridership increases are not derived by merely expanding bicycle infrastructure but rather the type of infrastructure.[14]

Separated bikeways can be implemented by making use of existing pavement and drainage along the roadway network. Separated bike lanes have also been known to encourage a decrease in vehicle speed, leading to fewer serious/fatal collisions, as driver awareness increases thus, creating safer driver behavior.

Separated bikeways are most appropriate on streets with higher speeds and traffic volumes where greater separation is essential. By separating bicyclists from vehicular traffic, physically separated bike lanes can offer a "protected" facility which is attractive to a wider range of users. Dedicated and separated bicycle lanes make an attractive facility for all rider levels and ages and improves perceived safety, attracting new riders. Ten percent of new riders on recently constructed protected lanes switched from other modes.[15]

14 https://www.citylab.com/transportation/2016/11/why-protected-bike-lanes-save-lives/508436/

15 https://www.citylab.com/transportation/2014/06/protected-bike-lanes-arent-just-safer-they-can-also-increase-cycling/371958/

Barriers can vary depending on whether the installation of the separated bikeway is a retrofit project on an existing roadway or being implemented with a road reconstruction project. Some barrier types for both conditions are listed below.

Barriers applicable for retrofit projects:

- Parked cars
- Flexible delineators or bollards
- Planters
- Parking stops
- Concrete barrier

Barriers applicable for reconstruction projects:

- Curb separation
- Landscaped Medians
- Raised protected bike lane with vertical or mountable curb
- Pedestrian safety islands

The physical separation measures can range from simple, painted buffers and flexible edges, to more significant efforts like grade separation, raised curbs, parking lanes, and bollards or planters. Factors such as roadway characteristics, available space, and cost may determine what type of separation measures are employed. Separated bikeways do require special attention at intersections and approaches. Both must be carefully designed to ensure safety and ease left-turn conflicts for bicyclists to cross the street.

For one-way separated facilities within street sections that experience high bicycle volumes or uphill conditions, it is recommended to provide a minimum 7-feet wide lane to promote safe passing practices. The physical barriers (bollards, curbs, etc.) should be oriented towards the inside edge of the buffer when possible to provide the maximum amount of space for bicycle use.







In areas that experience high bicycle volumes or uphill conditions, it is recommended to provide a minimum of 12-feet to promote safe passing for a two-way protected bike lane. Two-way lanes on two-way streets are not as desirable as they create challenges for roadway users at intersections and driveways to navigate bicycle expectancy in these locations.

Two-way protected bike lanes are particularly well suited for one-way streets where the bike lane increases the density of the bicycle network and improves the connectivity and efficiency of routes. They can also provide a trail-like experience when connected to a multi-use path or greenway.

Separated bikeway facilities are particularly effective in locations that employ bike-share systems. The bike-share system is likely to encourage less-experienced cyclists to venture into the bicycle network. These bikes are heavier, upright, and slower, and are typically being operated by people less experienced. As these riders are typically not as confident, getting them comfortable with riding in the city is where separated bike lanes are desirable. "As cities look to increase the number of people riding bikes, they're finding that better-designed facilities are the ones that really work." [16]

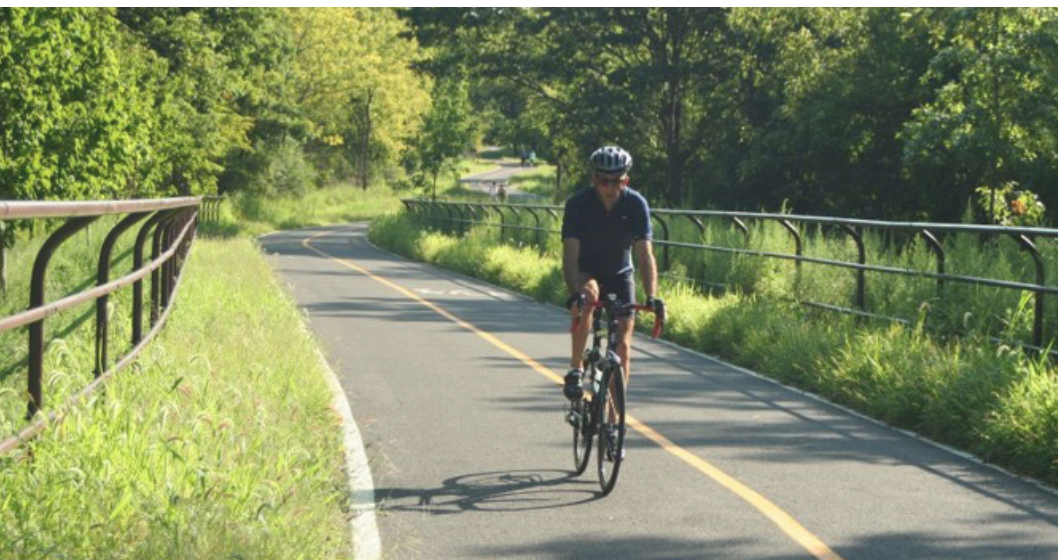
Another recent trend is bike sharing. Bike sharing programs offer innovated transportation solutions to individuals on an interim basis for short, point-to-point trips, allowing users to access a bicycle at any time either at a self-serve bike station or through smart technology for dockless bikes. Individuals may use bike share facilities for one-way trips, round-trips, or both and are often combined with other modes of transportation (e.g. transit) providing a first-and-last mile connector.

As such, bike share differs from traditional bike rental services as the bike share trips are more spontaneous in nature. Bike sharing programs can be a great way to promote transportation choices, offering the opportunity to connect residents to employment, schools, parks, commercial centers, and other destinations.



16 https://www.citylab.com/transportation/2016/11/why-protected-bike-lanes-save-lives/508436/

3 existing conditions





CHAPTER 3 > EXISTING CONDITIONS

EXISTING GREENWAYS, TRAILS, SIDEWALKS AND BIKE LANES

GREENWAYS

While Concord continues to increase their greenway offerings, currently residents and visitors have access to the following greenways:

CITY GREENWAY	MILES	SURFACE	DESCRIPTION
VILLAGE GREENWAY	0.5	ASPHALT	THROUGH HISTORIC GIBSON VILLAGE COMMUNITY; ACCESSIBLE TO WALKERS, RUNNERS, AND BICYCLISTS
HAROLD B. MCEACHERN GREENWAY	2.2	ASPHALT/ CONCRETE, BOARDWALK, & PARTS ON ROAD	CONNECTS LES MYERS PARK TO MCGEE PARK & MCEACHERN GREENWAY DOWNTOWN CONNECTOR. ACCESSIBLE TO WALKERS, RUNNERS, AND BICYCLISTS, RUNS ALONG THREE MILE BRANCH CREEK
DOWNTOWN GREENWAY LOOP LAWNDALE AVE, PATTON CT., UNION ST. SOUTH (INCLUDES PART OF MCEACHERN GREENWAY FOR TOTAL 4.0 MILE LOOP)	2.3	ASPHALT / CONCRETE (SIDEWALK)	CONNECTS DOWNTOWN TO MCGEE PARK AND MCEACHERN GREENWAY TO LES MYERS PARK. SIDEWALKS ARE UTILIZED TO COMPLETE THE LOOP ALONG LAWNDALE AVENUE AND UNION STREET SOUTH.
HECTOR HENRY GREENWAY (MOSS CREEK PHASE)	1.5	ASPHALT AND BOARDWALK	SCENIC WETLAND WALK ADJACENT TO ROCKY RIVER, CONNECTING MOSS CREEK VILLAGE TO ODELL PRIMARY SCHOOL.
HECTOR HENRY GREENWAY (WEDDINGTON ROAD PHASE)	1.3	ASPHALT, CONCRETE, & BOARDWALK	SCENIC WETLAND AND FOREST WALK CONNECTING THE WEDDINGTON ROAD BARK PARK WITH THE EMBASSY SUITES.
GEORGE LILES TRAIL	1.3	CONCRETE	CONNECTS FROM WEDDINGTON ROAD TO AREA NEAR HIGHWAY 29
HECTOR HENRY (MILLS @ ROCKY RIVER)	2.4	NATURAL	TRAIL EXTENDS FROM ROCKY RIVER ROAD TO REEDY CREEK CONFLUENCE
TOTAL	**12.0**		

TRAILS

Walking Trails are also located within the following Parks:

- Beverly Hills Park
- J.W. (Mickey) McGee, Jr. Park
- James L. Dorton Park
- Marvin Caldwell Park
- Les Myers Park
- W.W. Flowe Park
- Weddington Road Bark Park
  - access to Hector Henry Greenway
- Frank Liske (County)

SIDEWALKS

Sidewalks in Concord need to be expanded, with several areas of the City lacking necessary pedestrian facilities to serve residents. Per Concord's Development Ordinance, sidewalks are required to be constructed along both sides of all new streets in a subdivision and along any street that provides access to the subdivision. While the ordinance outlines provisions to accommodate pedestrians in new residential development, it does not address existing neighborhoods where sidewalks are deficient.

For example, District 3 would benefit greatly from expansion of its sidewalks. District 3 neighborhoods including: Logan, Silverhill, Brown Mill, and Underwood Park are isolated due to lack of pedestrian infrastructure.

Driving to Caldwell Park in order to access the walking trails is a condition that should be alleviated. Residents within walking distance of Dorton Park also suffer from the same condition. As such, one of the City's goals is to have pedestrian connections to parks to provide residents an easy access to those amenities. It's also unfortunate that residents typically do not have ample opportunity to access retail and commercial services by foot.

And with many sidewalks in disrepair, Concord's Pedestrian Improvement Program (PIP) is overwhelmed. Currently, there are more than 60 requests for sidewalk improvements across the City as part of the PIP.

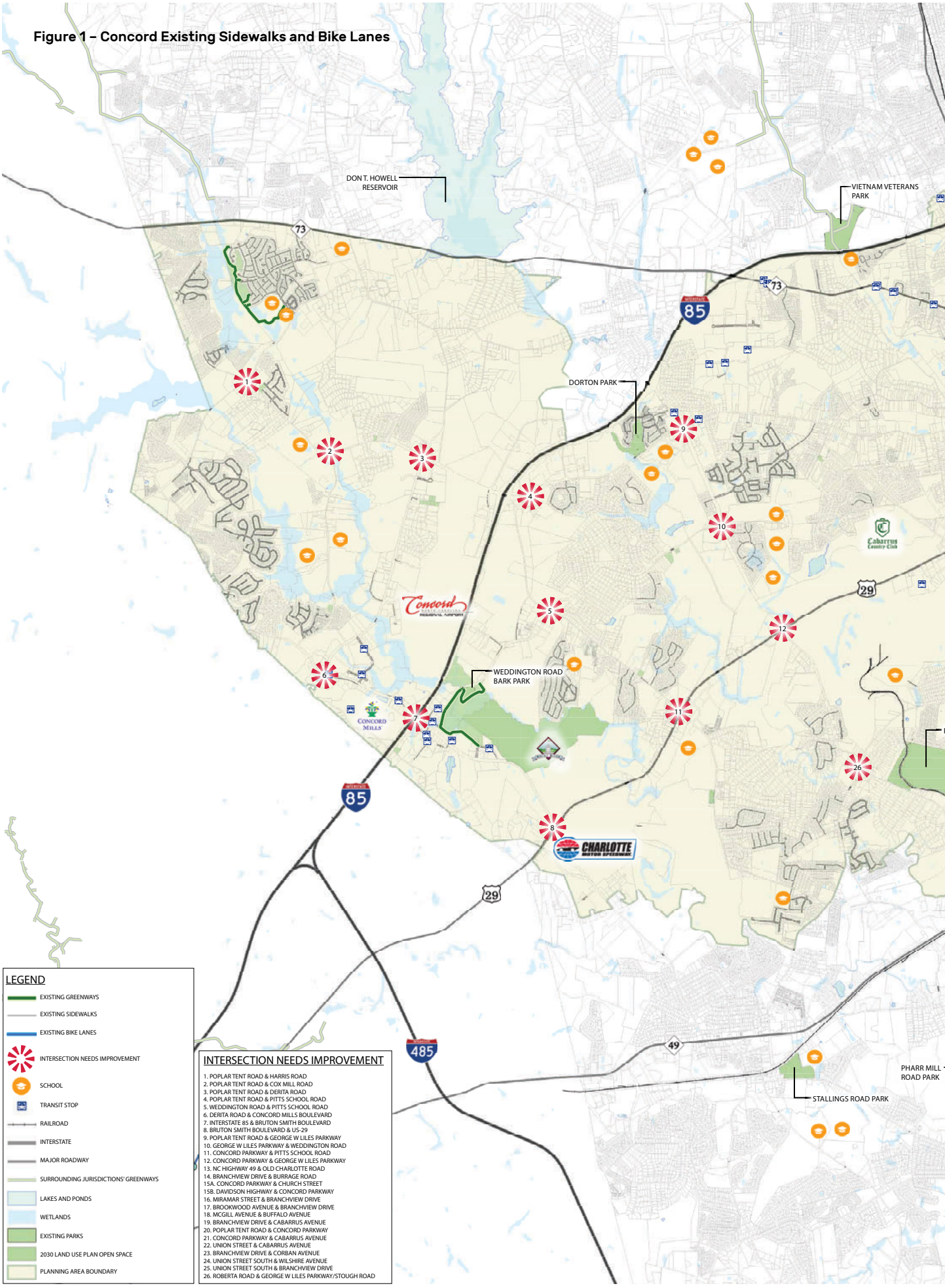
BIKE LANES

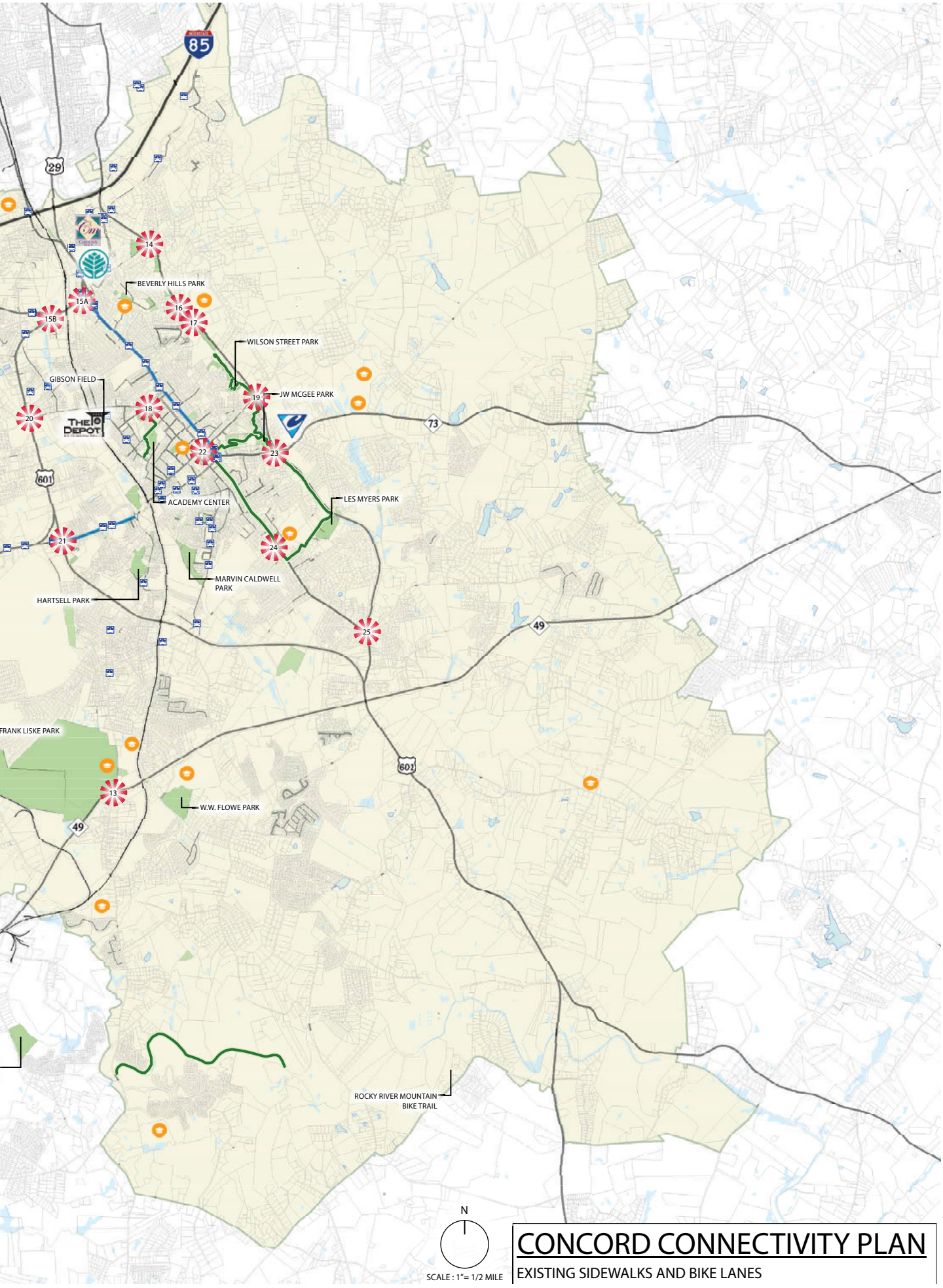
In Concord, conventional bike lanes only exist on Cabarrus Ave. (between 601 and the roundabout) and Church Street. During the public input process, the project team gathered several opinions regarding bike lanes in the City.

- There is no continuity as bike lanes do not connect to other bicycle infrastructure.
- There are many dangerous obstacles within the bike lanes (e.g. potholes, sewer grates, gravel) forcing cyclists to unsafely encroach into vehicle travel lanes.
- Bike lanes terminate in awkward locations creating unsafe transitions across turn lanes, into intersections, or merging back into vehicular traffic. This is not only confusing for the cyclists, but also drivers.



Figure 1 – Concord Existing Sidewalks and Bike Lanes





CONCORD CONNECTIVITY PLAN

EXISTING SIDEWALKS AND BIKE LANES

STAFF & LEADERSHIP COMMENTS ON EXISTING CONDITIONS

As previously mentioned, Staff and City Leadership were integral in the development of Concord's Open Space Connectivity Analysis, providing valuable insight into the existing conditions of Concord's pedestrian transportation system and the level of connectivity currently provided. Their first-hand knowledge of favorable existing conditions as well as areas that need improvement were integrated into the overall system recommendations. Some comments obtained from Staff and Leadership include:

General Comments:

- Leadership loves the existing greenway system. Goal is to expand upon current offerings.
- The sidewalks at Burrage Rd. (immediately NE of Lake Concord Rd.) are nice
- Woodlands and riparian corridors within the City are opportunities to enhance connectivity, to educate the public, and to market as a natural amenity for Concord
- Driving to Dorton Park to utilize the park's walking trails is unfortunate. Goal is to have pedestrian and/or bicycle connections to Parks.
- Biking within some neighborhoods is dangerous
- It is unfortunate that residents of Afton Village must get in their cars to access services at Afton Ridge (e.g. Harris Teeter)
- District 3 is isolated and lacks pedestrian and bicycle infrastructure
  - There are no bike lanes
  - The only walking trail in area is at Caldwell Park
  - Is in dire need of sidewalks

Transportation Comments

- Currently more than 60 requests for sidewalk improvements across the City as part of the Pedestrian Improvement Program
- Have not historically worked with NCDOT to integrate bike/pedestrian facilities during resurfacing projects
- Have not historically integrated bike/pedestrian facilities City resurfacing
- Resurfacing projects within narrow subdivision and downtown local streets
- Resurfacing projects on larger streets typically only patch jobs which limit the opportunity to integrate bike/pedestrian facilities
- Typically, resurfacing projects do not have enough money in their budgets to repave entire streets to accommodate bike and pedestrian facilities
- Bike Share facilities are a joint project with the Planning Department. Council approved a pilot program in downtown and are interviewing vendors.
- Currently the City does not have data collection mechanisms to calculate number of patrons that bike or walk.
- As a general policy, there was a past decision to utilize wide outside lanes for new road construction.

Planning Comments

- When rezoning, developers commonly lean toward conditional rezoning to maintain development flexibility
- Rezoning conditions may require bike racks and connectivity for pedestrians, but typically only within the planned community
- Pedestrian connectivity to Amenity areas within the community is required
- If a project is a "by right" development, current Concord Development Ordinance only requires sidewalks
- Need language in the ordinance for developers to dedicate easement, pay a fee-in-lieu, or build connections to assist with creating a City-wide connected system

Engineering Comments

- No federal money was utilized for the past few projects
- The Engineering Departments prefers to use City money to fund projects; projects are easier manage and navigate
- STIP (NCDOT State Transportation Improvement Projects) is a better funding source when constructing a large project
- Easement acquisition is always the challenge

Building and Grounds Comments

- Greenway maintenance is tailored - if it is attached to a park, the greenway is bundled into park maintenance
- Graffiti on pavement is the largest maintenance problem
  - Usually youth related
  - Try to get it off as soon as possible
- Invasive species are an issue (e.g. kudzu, privet, cat briar, mimosa) - City is proactive about invasive removal, but is not currently a targeted program

Water Resources Comments

- Currently restoring Stricker Branch
- There are opportunities for water quality education
- City not actively funding future stream restoration projects
- Stormwater master plan identified some water quality projects, but are at a lower priority than infrastructure projects like culvert upsizing

PUBLIC COMMENTS ON EXISTING CONDITIONS

Like Staff and City Leadership, the public provided a treasure trove of insight into Concord's existing pedestrian system conditions. Some public comments obtained from the workshops and the online survey include:

- **Most residents feel safe while walking, running, or biking on existing facilities:**
  - within their respective neighborhoods
  - when using a bike lane
  - when using trails at the parks
  - when walking along sidewalks
  - when using the Greenways
  - in Downtown
  - when traveling from Highland Creek down Christenbury Pkwy. toward the mall
- **Residents do not feel safe while walking, running, or biking:**
  - in traffic
  - on most secondary roads
  - the greenway at night
  - to W.W. Flowe Park
  - to Central Cabarrus High School
  - along Roberta Road
    - has no sidewalk (must share the road with cars who always drive over the speed limit)
    - has no lights
  - from Laurel Park Subdivision to Publix, Food Lion, or Harris Teeter
  - on US 29
  - on Church Street where Locke Mill Plaza residents try to get across the street to Danny's Place
- **Obstacles that deter residents from walking as a mode of transportation or recreation include:**
  - lack of sidewalks where they live
  - dangerous traffic conditions that make walking of any type of distance undesirable
  - lack of wheelchair and parking access to greenways
  - general safety concerns trying to traverse a fractured network
- **Obstacles that deter residents from biking as a mode of transportation or recreation include:**
  - lack of bike routes/paths where they live
  - dangerous traffic conditions that make biking undesirable and unsafe
  - there is no continuity in bike lanes
- **Residents commented on dangerous biking conditions that include:**
  - On Union Street, approaching the Union Street / Corban Avenue intersection from the south
  - road markings are not adequate to inform drivers about cyclist circulation
  - where the bike lane on Church Street ends as it approaches Buffalo Avenue it is confusing to drivers
  - The bike lanes on Church street are in terrible shape with many dangerous obstacles for cyclists
  - On the Church Street bike lane, there are potholes (one in particular near Brookwood Ave.) and sewer grates (northbound near Auto Bell) that force cyclists out into the road
  - Poplar Tent Road is almost impossible to ride on
- **On Church Street downtown, the signal lights do not change unless a car comes up the hill from the Post Office/ McCachren area.**
- **At the crosswalk near the jail, vehicles do not stop even when the pedestrian has a "walk" symbol. Drivers continue to illegally turn right on red (not stopping at all).**
- **NW Concord, near Concord Mills, is really lacking in connectivity**
- **Lack of sidewalks on Poplar Tent is an issue**
- **There are not enough wayfinding on trails, including greenway maps**
- **Paths are not wide enough to allow bikers and walkers to co-exist**
- **There is no lighting along the greenways**
- **Southwest quadrant of the City is severely lacking in city parks/trails/ community centers/library**

Additional information regarding public input can be found in section 4: Community Engagement.

SUPPORT FOR CONNECTIVITY IN PREVIOUS PLANNING DOCUMENTS

As far back as 2002, Concord (and Cabarrus County) have clearly articulated their commitment to becoming more pedestrian and bicycle friendly communities. This vision of a connected, safe multi-modal transportation system is evident in all planning efforts over the past decade. Review of previous planning documents capitalizes on previous efforts to draw inspiration and analyze the history of planning efforts regarding connectivity proposals. These documents provide insights that may inform recommendations for the creation of a pedestrian and bicycle transportation system.

Documents reviewed include:

Master Plans / Needs Assessments

- Livable Community Blueprint for Cabarrus County (2001-2010)
- Carolina Thread Trail Master Plan – For Cabarrus County Communities (2009)
- City of Concord Recreational Needs Assessment Survey Findings Report (2014)
- Cabarrus County Comprehensive Master Plan (2015)
- Concord Comprehensive Parks and Recreation Master Plan (2016)

North Carolina Transportation

- Rowan-Cabarrus MPO Comprehensive Transportation Plan
- STIP (NCDOT State Transportation Improvement Projects)
- NCDOT 'Typical Highway Cross Sections' Memo
- NC 73 Transportation / Land Use Corridor Plan (2004)
- Evaluating the Economic Impact of Shared Use Paths in North Carolina

Concord Small Area Plans

- Classic Concord Center City Plan (2003)
- Concord Parkway / Roberta Church Road Small Area Plan (2005)
- Concord Parkway / Warren C. Coleman Small Area Plan (2007)
- Cabarrus County Central Area Plan (2008)

Concord Transportation Plan

Blue Cross / Blue Shield – MUP Economic Impact Study (2005)

City of Concord 2030 Land Use Plan (2018)

Cabarrus County NC – Healthy Community Design Workshop (2018)

MASTER PLANS / NEEDS ASSESSMENTS

LIVABLE COMMUNITY BLUEPRINT FOR CABARRUS COUNTY (2001-2010)



In 2002, Concord participated in the Livable Community Blueprint for Cabarrus County. This plan was prepared as a flexible framework to guide Cabarrus County and its municipalities in the development of parks and recreation facilities and identify demands on bicycle and pedestrian routes.

The study determined providing safe and interesting environments for walking and biking was a high priority for residents. Goals were established to guide future park development, land acquisition, agency partnerships, and capital improvement projects. Those specific to pedestrian and bicycle connectivity include:

1. Pursue avenues available to preserve designated bicycle and pedestrian corridors for public access.
2. Provide safe bicycle and pedestrian access to all parks.
3. Create a transportation plan that will provide for a diverse and safe environment for bicycles and pedestrians to access a variety of destinations and services.
4. Recognize the recreation value of, and public interest in, natural resources such as Irish Buffalo Creek and the Rocky River as a recreation resource.

The Livable Community Blueprint defined close to 200 individual destinations where it was desirable to link with each other and with neighborhoods by bicycle and pedestrian friendly routes. Over 200 miles of on-road and off-road routes were designated as pedestrian and bicycle routes. Another 190 miles of bicycle routes were identified along existing roads.

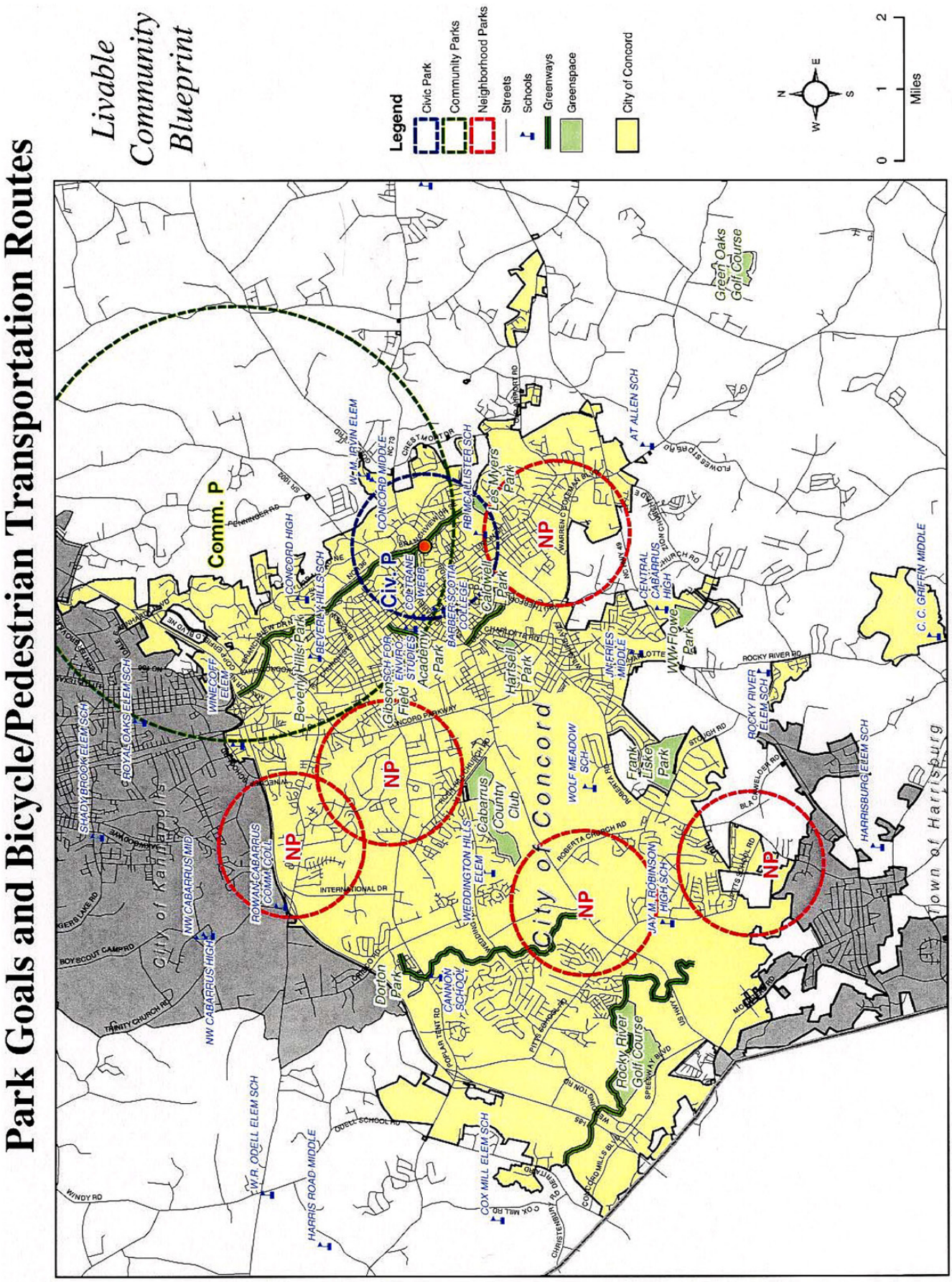


Figure 2 – Livable Community Blueprint – Concord Park Goals and Bicycle/Pedestrian Transportation Routes (not to scale)

CAROLINA THREAD TRAIL MASTER PLAN – FOR CABARRUS COUNTY COMMUNITIES (2009)

CAROLINA THREAD TRAIL

Weaving Communities Together

The Carolina Thread Trail (CTT) is a regional network of greenways, trails, and conserved lands that will link 15 counties; a portion of which winds its way through Cabarrus County. This offers valuable opportunities for recreation, alternative transportation, and economic development as well as contributes to land and open space conservation efforts. The CTT also promotes the preservation and improvement of residents' quality of life through protection of natural habitats and water and cultural resources.

Adopted in 2009, the CTT Master Plan outlines a 100-year vision, a 20-year master plan, and a 5-year action plan for the development of an interconnected trail system; one that will conserve natural resources and provide public access to some of the most scenic areas of the County. The CTT trail route recommendations built upon past plans to integrate all existing and proposed municipal and County trails with additional segments that together, create a comprehensive multi-use network.

The 100-mile Carolina Thread Trail route within Cabarrus County includes approximately six miles of existing trails and incorporates 77 miles of trails already proposed by local governments within the County (primarily trails proposed via the Livable Community Blueprint). Approximately 77% of the "Thread" in Cabarrus County is planned along streams and river corridors, 13% along existing bike routes and sidewalks, and 4% along road rights-of-way.

The CTT master plan identifies its top priority greenway corridors. These segments were selected as priority projects based on criteria such as proximity to population, available land/right-of-way, functionality, ease of development, and available funding. Based on that criteria, the segments of the Carolina Thread Trail that have been designated as priorities are:

1. Segment E - Irish Buffalo Creek Corridor: Rowan County Line to North Cabarrus Park
2. Segment I - Cabarrus Ave.: Connector to Myers Park Greenway
3. Segment B - Rocky River Corridor: Clarke Creek to Harrisburg

All three priority segments either run through or touch the edge of Concord. With an interconnected greenway/trail system, it is important to link desirable destinations safely, thus, providing opportunities for pedestrians and bicyclists to freely travel between them. Some specific destinations in and around Concord that were most frequently mentioned during the CTT planning process were:

1. Concord Mills Mall
2. Cox Mill Elementary
3. Downtown Concord
4. Frank Liske Park
5. James L. Dorton Park
6. Les Myers Park
7. Lowe's Motor Speedway
8. North Cabarrus Park
9. W. W. Flowe Park

Figure 3 highlights proposed trail connections specifically in Concord. Trails shown in purple are those recommended for the CTT designation while trails shown in green are presented for consideration to supplement the community's trail system and further tie together destinations.

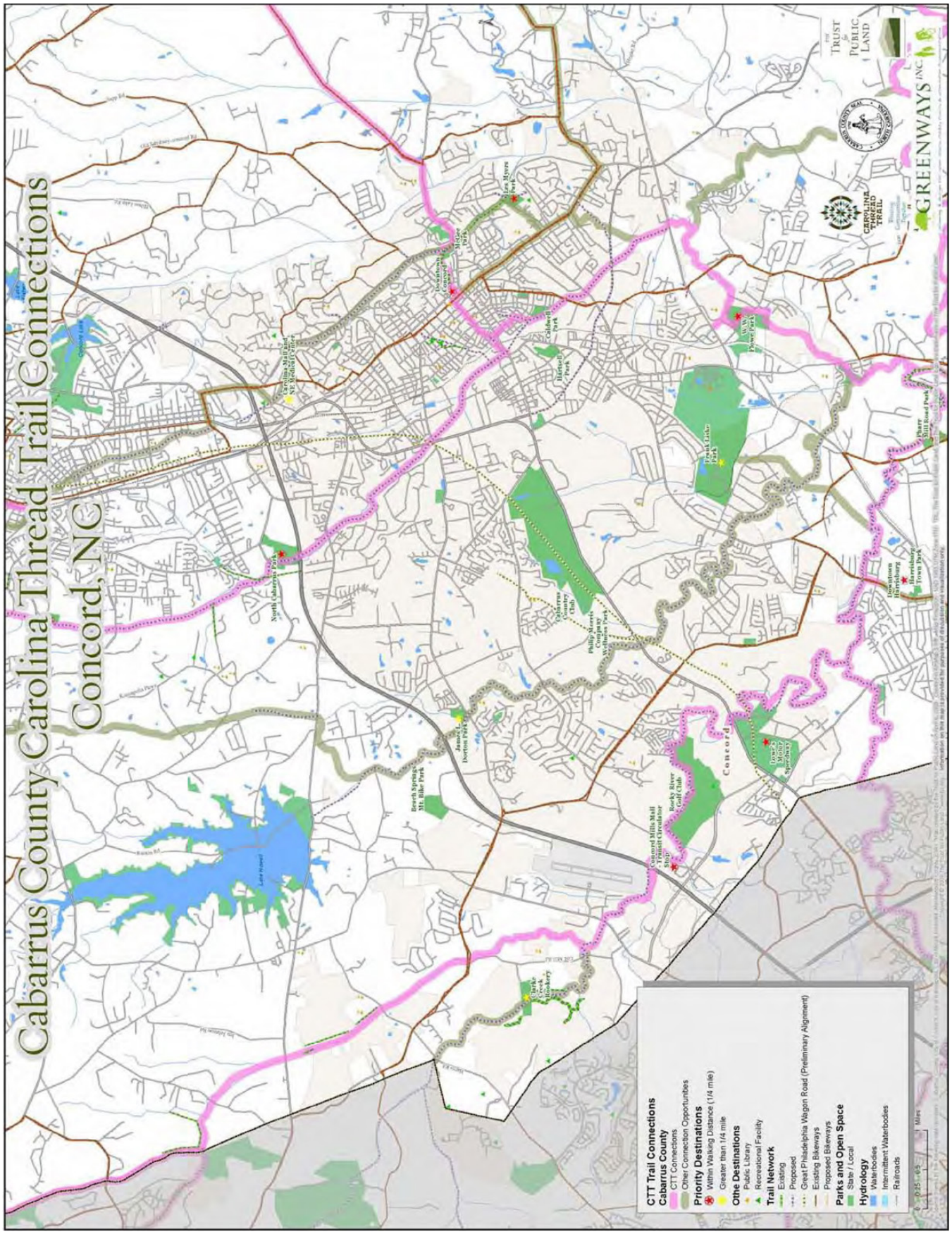


Figure 3 - Carolina Thread Trail Connections in Concord

CITY OF CONCORD RECREATIONAL NEEDS ASSESSMENT SURVEY FINDINGS REPORT (2014)

In 2014, the City's Parks and Recreation Department invested in a recreational needs assessment survey to establish needs and priorities for the development of future parks, recreation facilities, cultural offerings, programs, and services.

Having participated in the Livable Community Blueprint and supporting the Carolina Thread Trail, the City of Concord has been diligently working to expand their recreational programs, develop parks, and install greenways to achieve and fulfill the goals and recommendations outlined in those documents.

1. To confirm previously recognized needs and identify current user desires, the City engaged in a recreational needs assessment survey designed to obtain statistically valid results of user preferences. Through a combination of paper surveys and online distribution, the compiled data resulted in the following recommendations and major survey findings specifically related to connectivity:
2. The Parks and Recreation Department should further develop the current greenway system to connect with local neighborhoods and parks. Survey results indicated that if greenways were more easily accessible, they would be used more frequently. Most are located more than 3 miles from survey respondents' residence.
3. The Parks and Recreation Department should investigate greenway connections that can be made with the most popular park facilities: Les Myers Park, Frank Liske Park Soccer Complex, and Academy Recreation Center.
4. Residents would like to see and experience more greenways in the community to primarily use them for recreation, exercise and personal health improvement.
5. There is also a strong interest in mountain bike trails and bike lanes/trails. It was recommended that the Parks and Recreation department provide more natural surface trails through woodlands with varying degrees of difficulty to respond to the strong interest from the mountain biking community.
6. The City should connect the trail system to shopping destinations as a matter of economic interest.
7. To assist cyclist/pedestrian collisions on trails that abut roads, bike lanes should clearly be delineated on roadways with 35 mph or less speeds and nearby greenway paths should be of adequate width to provide pedestrian only requirements. In areas where roadway speeds exceed 35 mph, the greenway path should be wide enough to safely accommodate both cyclists and walkers/joggers.
8. There is concern for personal safety along trails. In areas where the greenway system abuts high traffic roads, a separation device (e.g. planting strip) should be incorporated to provide additional protection and comfort users.
9. To address suspicious activity on the greenways, proposed trails should avoid remote areas, minimize thick underbrush adjacent to the pathway, and provide lighting where possible.
10. It is recommended that the City provide dog parks, playgrounds, and picnic areas along greenways where possible.

CABARRUS COUNTY COMPREHENSIVE MASTER PLAN (2015)

In 2002, Cabarrus County adopted the Livable Community Blueprint, a planning document created to develop a ten-year vision for parks and recreation needs (see previous pages for additional information on the Livable Community Blueprint). The 2002 plan established goals to guide future park development and while some new parks and greenways were developed and some land was preserved in accordance with those goals, most of the proposed recommendations have not been implemented.

Therefore, in 2014, recognizing the need for an updated plan, elected officials funded a new 10-year vision planning study specifically for the Active Living and Parks Department of Cabarrus County.

The following are recommendations extracted from the Cabarrus County Comprehensive Master Plan that specifically relate to connectivity.

1. The facility needs are considered County wide needs and meeting these needs should be a coordinated effort by all parks and recreation providers within the County.
2. Priority should be placed on the development of walking trails in all existing and future parks. The County should look for opportunities to work with other agencies and/or organizations to explore trail development along Rocky River and Irish Buffalo Creek.
3. The County should also work collaboratively with municipal agencies and the Carolina Thread Trail in the development of the CTT network of greenways. Current demand calls for an additional 21 miles of trails with over 30 additional miles to meet 2025 needs.
4. The County should encourage the development of bike routes to connect all County cities, towns, and points of interest. Bike trails should include paths in existing and future parks as well as bike lanes or wider shoulders on roads to accommodate cyclists (work in collaboration with NCDOT). The County should also look for opportunities to develop mountain bike trails in existing or future parks.

CONCORD COMPREHENSIVE PARKS AND RECREATION MASTER PLAN (2016)

In December of 2016, Concord adopted their Comprehensive Parks and Recreation Master Plan. While the plan focused on overall Parks and Recreation offerings, greenways and trails rose to the top of the desired facility list. The study revealed that greenways were one of the most popular and most frequently visited destinations in the community.

However, data collection concluded that Concord ranked near the bottom among peer agencies for total trail miles (8 miles total) and trail miles per 1,000 residents (.098 miles). Best practice agencies typically offer between 0.25-0.5 miles of trail per 1,000 residents.

The existing greenways and trails within the City receive heavy use and are an important asset within the parks system. During the master plan process information was garnered that indicated there was significant interest in greenways and trails with more than two-thirds of the survey respondents suggesting a need for these.

Several miles of planned trails have already been identified through the Carolina Thread Trail master plan as well as planned by the City of Concord Parks and Recreation staff. However, most of these planned trails follow drainage patterns and parallel existing streams and creeks which run primarily north/south. New corridors were identified in the master plan which attempt to bring more connections east/west to create a trail network linking additional communities, urban areas, parks and other destinations.

It should also be noted that "inconvenient location" was cited as a barrier to greenway access and participation. This was consistent with the large proportion of survey respondents who felt there was a need for better geographic distribution of facilities. This notion was also identified in the focus group meetings.

When planning and building an expanded greenway system, geographic distribution should be considered.

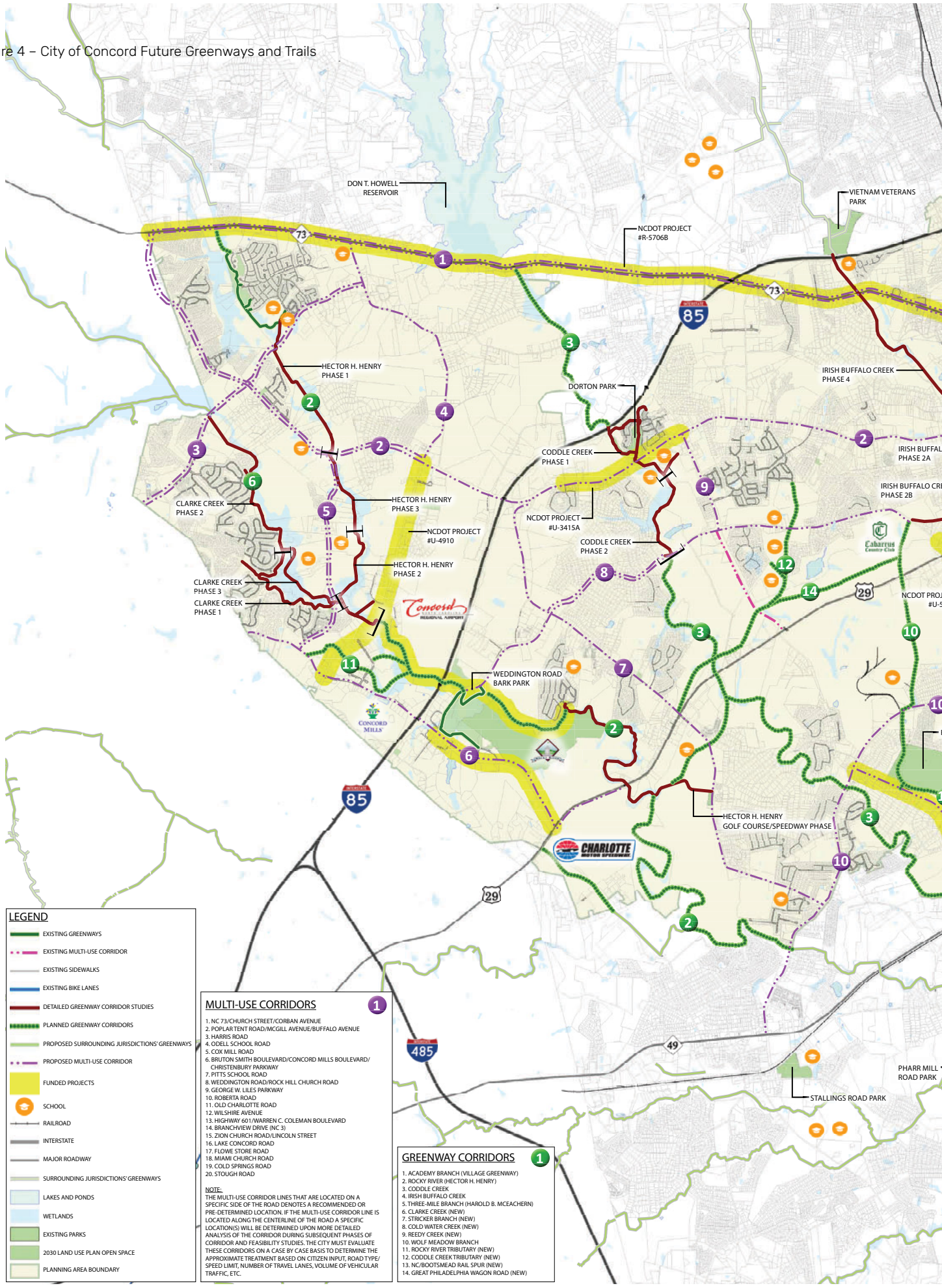
It is important to keep in mind that planning and building an ambitious connected network will take time and a concentrated effort. The master plan identified key strategies/recommendations to help advance greenway system growth. Those include:

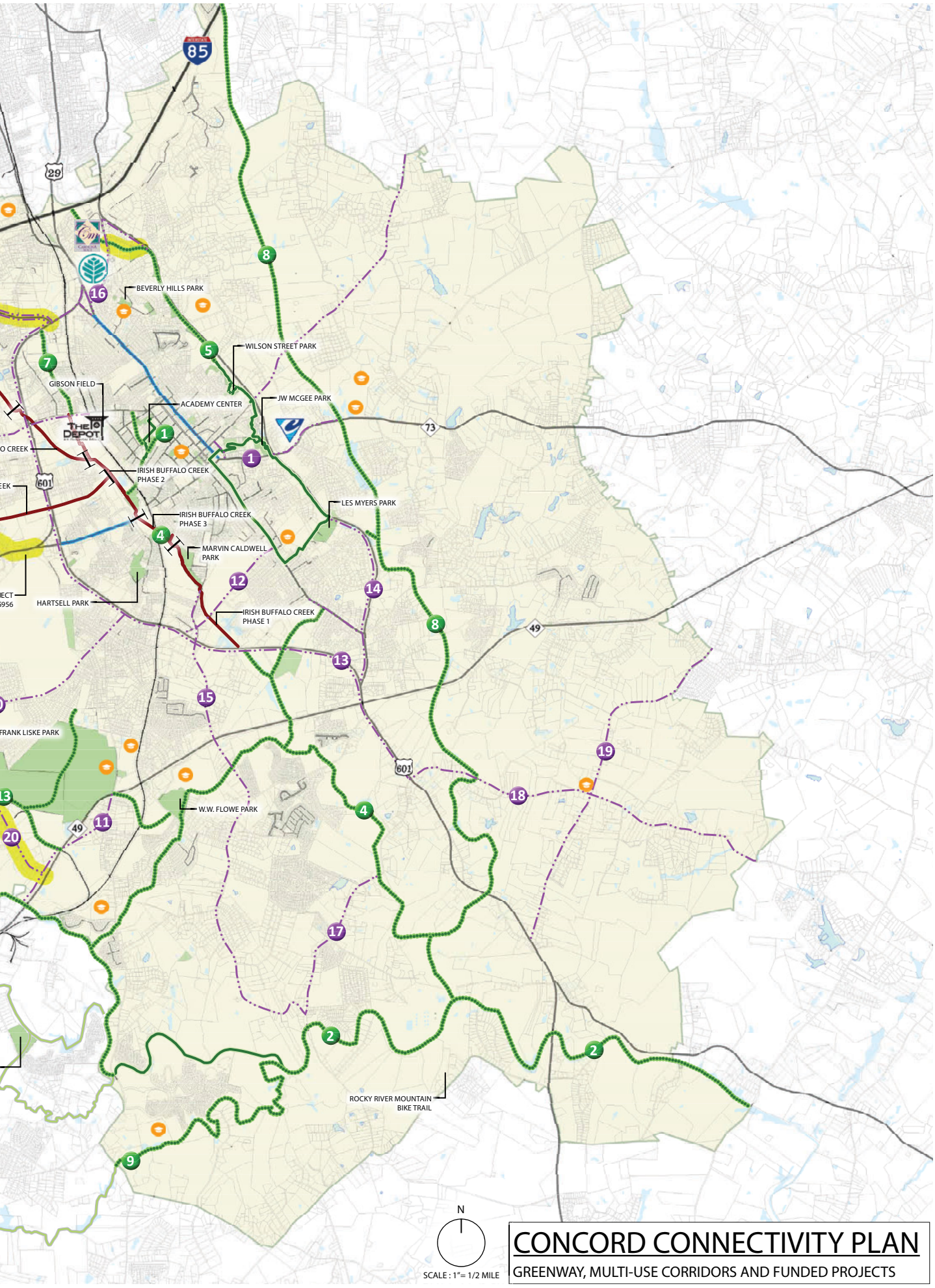
- **Consider Ordinance Updates & Development of Regulations Which Promote the Success of Parks and Recreation within the City:**
  - The Concord Development Ordinance (CDO) outlines land dedication, or fee in lieu, when a residential development is submitted for approval. The policy is written to add recreation acreage to the parks system to meet the needs of increased population caused by new residential community development. The policy should remain in place. However, additions to the policy should be considered to address greenway dedications. Trails and greenways are the highest priority for Concord residents. Therefore, stronger language to the park dedication ordinance should be added to detail how this greenway land may be dedicated in the future. The policy should also address both residential and commercial land uses where future greenways are proposed. As a by-product, this policy would help to strengthen the City's transportation needs. The City should therefore continue to work with state, regional, and local agencies in order to identify corridors and connections that are a part of the City's improvements, while also having an overall City-wide transportation plan and vision.

- **Expansion of the City Greenway System:**
  - Create a City of Concord greenway and trails commission to provide input on greenway and trails planning. The group should be made up of volunteers from both the public and private sectors with a passion for making the trails system a success.
  - Work to establish greenway corridor priorities which will link key elements within the overall parks system as well as serve a broad population.
  - Set a goal for completing +/-15 miles of new greenway trails in the next +/- 15 years. This will create a gain in momentum by breaking the larger goal into achievable smaller segments.
  - Consider hiring a dedicated greenway trails planning coordinator. This new staff person would take on the responsibility of identifying and securing the easements required for building the trails as well as assisting with the design, permitting and construction aspects of the new trails.
  - Identify key partnerships with land owners, public and private, who are also interested in seeing the expanded City-wide system in place.

- **Continued Upgrades and Maintenance of Existing Facilities:**
  - Harold B. McEachern Greenway
    - Consider incorporating public art along the greenway - sculpture along trail and/or mural in pedestrian tunnel
    - Consider installing additional rest stops
    - Continue with proposed plans to extend Greenway
  - The Village Greenway
    - Consider installing a few rest stops
    - Consider installation of environmental education displays to enhance the greenway experience
  - Downtown Greenway Loop
    - Consider installing a few rest stops
    - Consider installation of environmental education displays to enhance the greenway experience
  - Hector Henry Greenway (Moss Creek Phase)
    - Consider incorporating public art along the greenway
    - Consider installing additional rest stops
    - Continue with proposed plans to extend Greenway
  - Hector Henry Greenway (Weddington Road Phase)
    - Consider incorporating public art along the greenway
    - Consider installing additional rest stops
    - Consider installation of environmental education displays to enhance the greenway experience
    - Continue with proposed plans to extend Greenway

Figure 4 – City of Concord Future Greenways and Trails





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SCALE : 1"= 1/2 MILE

CONCORD CONNECTIVITY PLAN

GREENWAY, MULTI-USE CORRIDORS AND FUNDED PROJECTS

NORTH CAROLINA TRANSPORTATION

CABARRUS-ROWAN MPO COMPREHENSIVE TRANSPORTATION PLAN (2017)

The Cabarrus-Rowan Metropolitan Planning Organization (MPO) Comprehensive Transportation Plan (CTP) is a joint effort between the Cabarrus-Rowan MPO and the NCDOT – Transportation Planning Branch (TPB). The CTP determines future multimodal transportation needs and provides recommendations for a 25-30-year time frame. As part of the preparation of the CTP, input from local government officials, planning staff, and the public was garnered. The 2017 CTP was approved by the Cabarrus-Rowan MPO Transportation Advisory Committee (TAC) on January 25, 2017 and adopted by the NCDOT Board of Transportation on March 9, 2017.

Under State law (N.C.G.S. § 136-66.2), MPOs and municipalities are required to develop a Comprehensive Transportation Plan (CTP) in collaboration with NCDOT. This document should be utilized by local officials, serving as a guide to provide a well-coordinated, efficient, and economical future transportation system. A CTP is developed to ensure that planned transportation facilities reflect the needs of the public while minimizing disruption to residents, businesses, and the environment. Local governments may use the CTP to usher development and protect recommended project corridors.

The CTP proposes multi-modal project recommendations per the Complete Streets concepts. Complete streets are streets designed to be safe and comfortable for individuals of all ages and capabilities; pedestrians, bicyclists, transit riders, and motorists. Streets that follow the Complete Streets concepts are generally well-integrated with surrounding land uses and include sidewalks, suitable bicycle facilities, transit stops, appropriate street widths, and context-based traffic speeds.

The benefits of utilizing the Complete Streets approach include:

- Making it easier for travelers to get where they need to go
- Encouraging the use of alternative forms of transportation
- Building more sustainable communities
- Increasing connectivity between neighborhoods, streets, and transit systems
- Improving safety for pedestrians, cyclists, and motorists

Since the CTP is based on the projected growth for the planning area and actual growth patterns may differ from those anticipated, it may be necessary to accelerate or delay implementation of some recommendations. Some portions of the plan may also require revisions in order to accommodate unexpected changes in development.

Recommended improvements shown on the CTP maps represent identified transportation deficiencies and potential solutions to mitigate those deficiencies. While the CTP does propose recommended solutions, it may not represent the final location or cross section associated with the improvement since all CTP recommendations are based on high level systems analyses. For purposes of this plan, we are including in the following pages the pedestrian and bicycle maps as contained within the CTP. The Inventory and Recommendations table from the CTP can also be found as Appendix A.

Prior to implementing CTP projects, additional analysis is necessary to meet the National Environmental Policy Act (NEPA) or the North Carolina (or State) Environmental Policy Act (SEPA). During the NEPA/SEPA process, the precise project location and cross section will be proposed based on environmental investigation and public input.

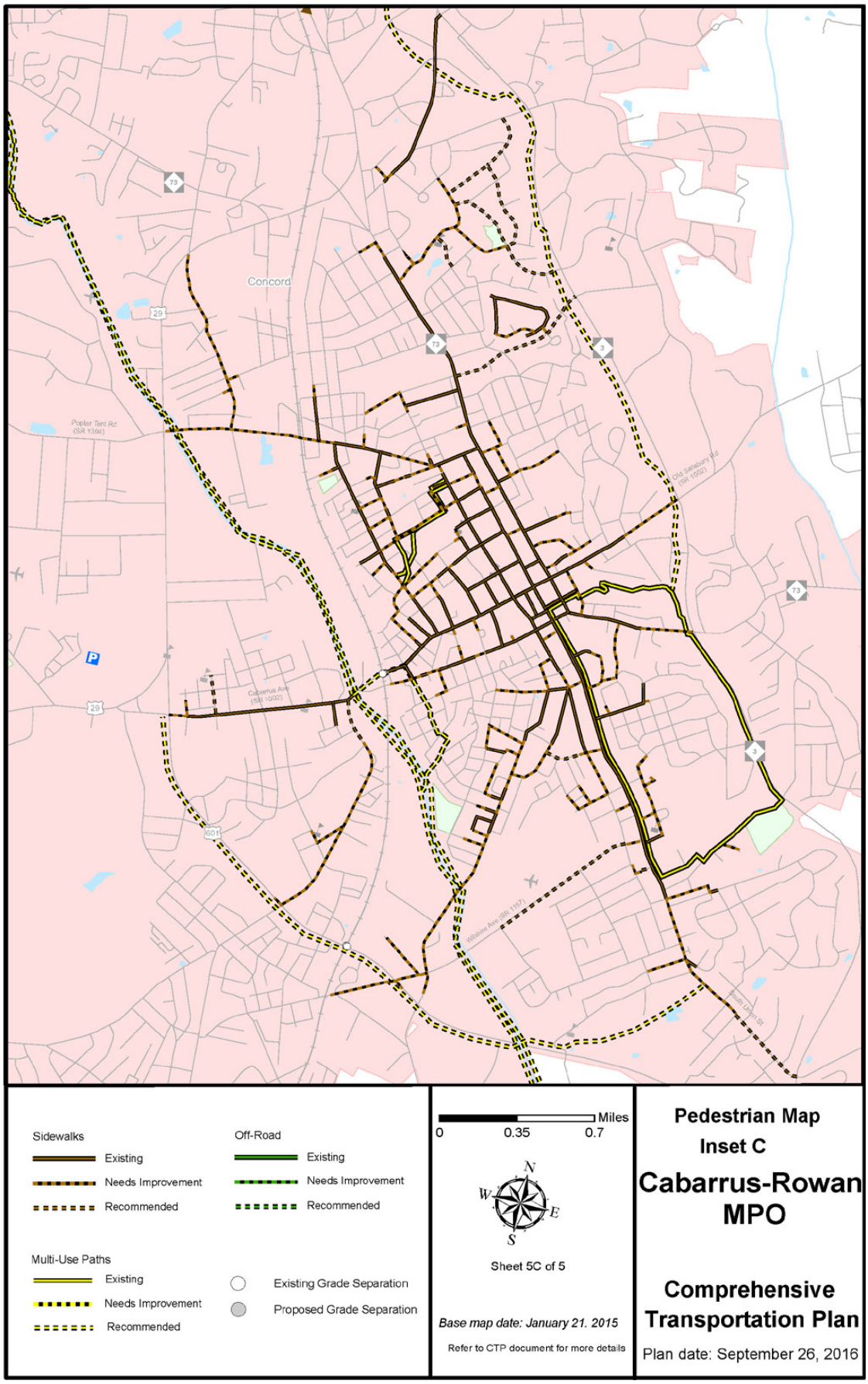


Figure 5 – Cabarrus-Rowan MPO – CTP Pedestrian Map

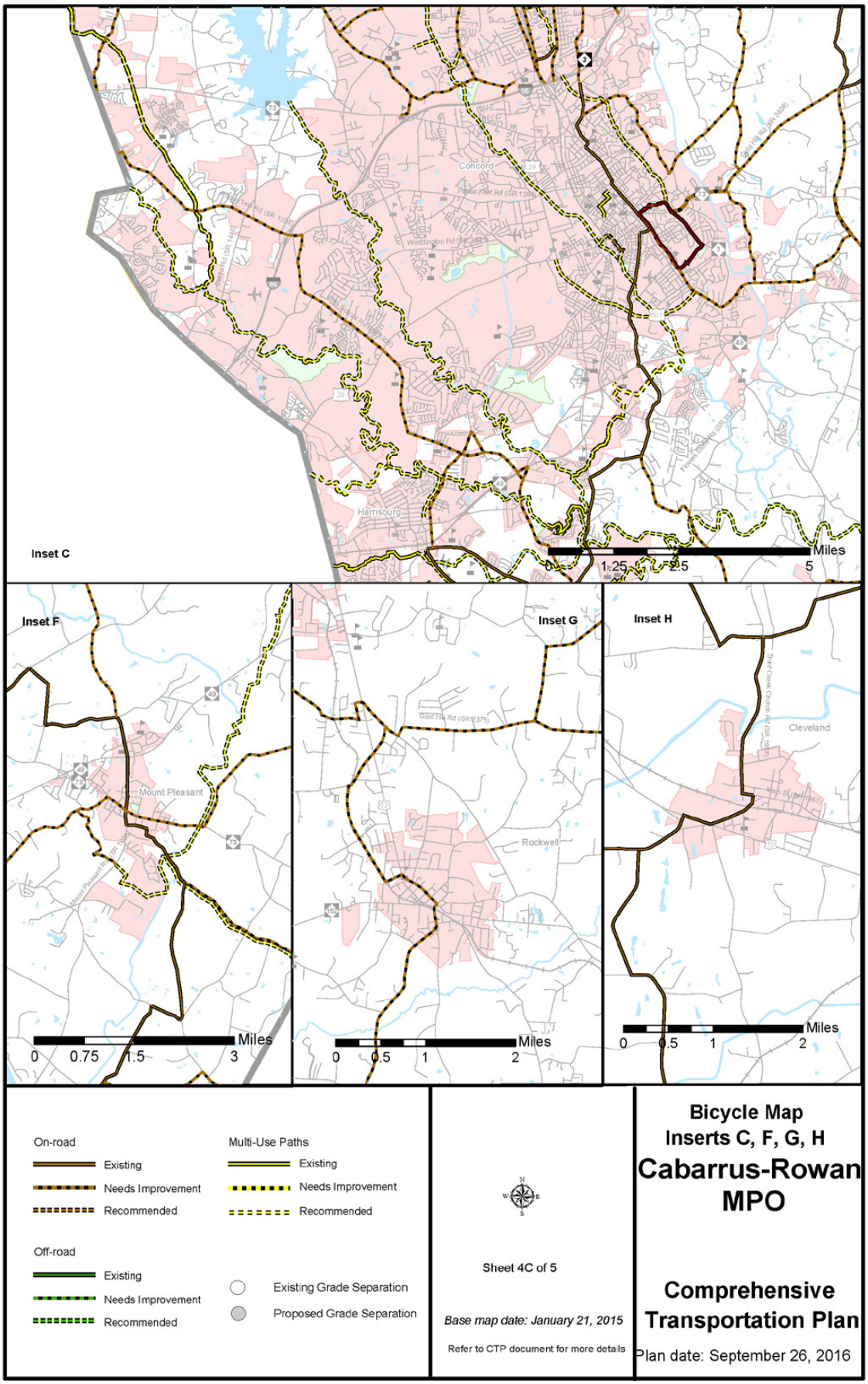


Figure 6 – Cabarrus-Rowan MPO – CTP Bicycle Map

STIP (NCDOT STATE TRANSPORTATION IMPROVEMENT PROJECTS)

NCDOT is currently reviewing the Complete Streets Policy and Guidance and it is anticipated that there will be changes to the cost share/ betterment policy. Several Divisions across the state have used their discretion to include bicycle and pedestrian elements within the planned and construction cross sections of their projects. These elements have included sidewalks, multi-use paths, and bike lanes. Division 10 in particular has shown a willingness to apply Complete Streets Design Guides on roadways that are appropriate for the inclusion of biking and walking facilities.

NCDOT 'TYPICAL HIGHWAY CROSS SECTIONS' MEMO

In response to the Strategic Transportation Investments Law (House Bill 817), a comprehensive planning and design "typical" highway cross sections were updated. Established in these guidelines are design elements that emphasize safety, mobility, complete streets, and accessibility for multiple modes of travel. These "typical" highway cross sections should be used as guidelines for comprehensive transportation planning, project planning, and project design activities for State Transportation Improvement Program (STIP) projects and other applicable projects. See Appendix B for "typical" cross section illustrations.

NC 73 TRANSPORTATION / LAND USE CORRIDOR PLAN (2004)



The NC 73 Transportation/Land Use Corridor Plan is a coordinated land use and multi-modal transportation plan for a 35-mile corridor along NC 73. The catalyst for the plan was recognizing that development pressures along the Corridor and the resulting vehicular activity, have overwhelmed the road's capacity.

The overall goal of the plan was to design a comprehensive land use, urban design, and transportation plan that incorporates existing and anticipated land use and transportation patterns for the eight jurisdictions along the corridor. Included in the plan are ten (10) road typologies and four (4) intersection typologies, of which accommodations for pedestrians and bicycles are incorporated into most.

Pedestrian and bicycle accommodations within these typologies include hike and bike trails within the right-of -way, sidewalks both adjacent to and separate from the roadway, and bicycle lanes adjacent to travel lanes. Pedestrian crosswalks are also incorporated into several of the typologies.

Throughout the 35-mile corridor, two segments touch Concord, the Coddle Creek Segment and the Rocky River Segment.

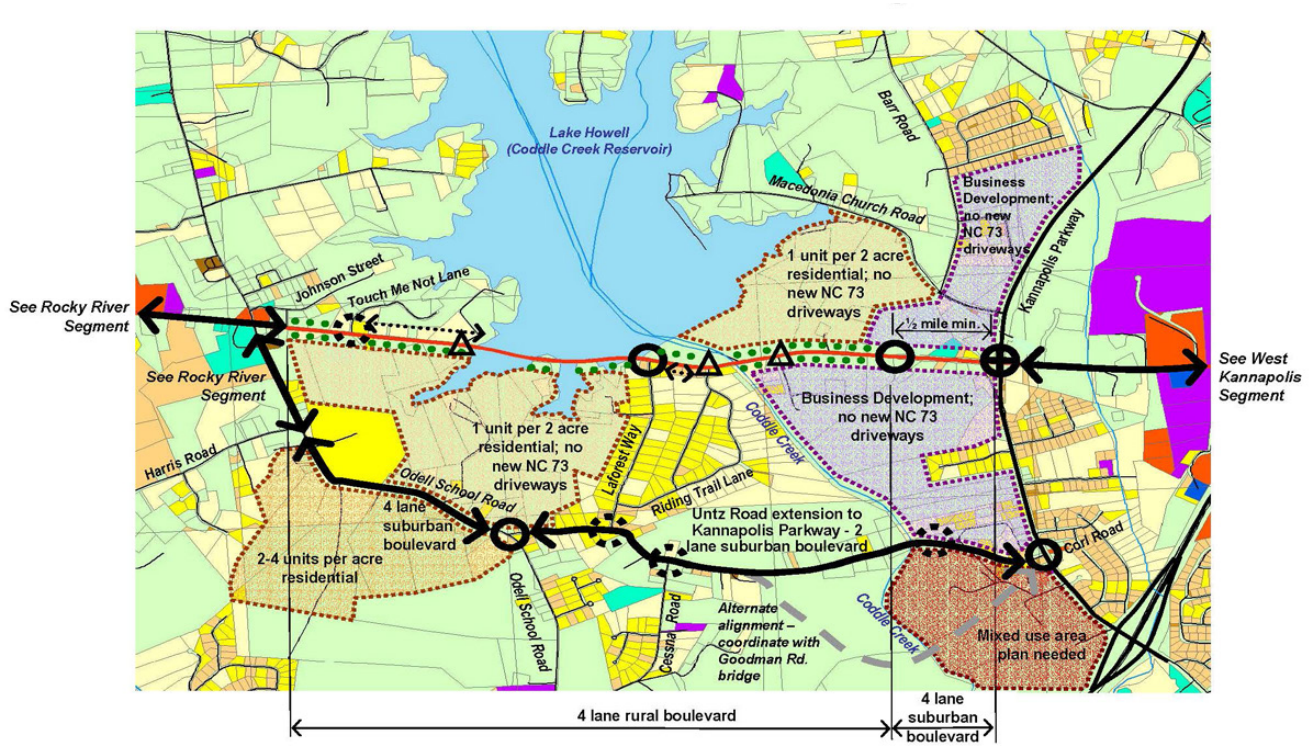


Figure 7 – NC 73 Transportation / Land Use Corridor Plan: Coddle Creek Segment

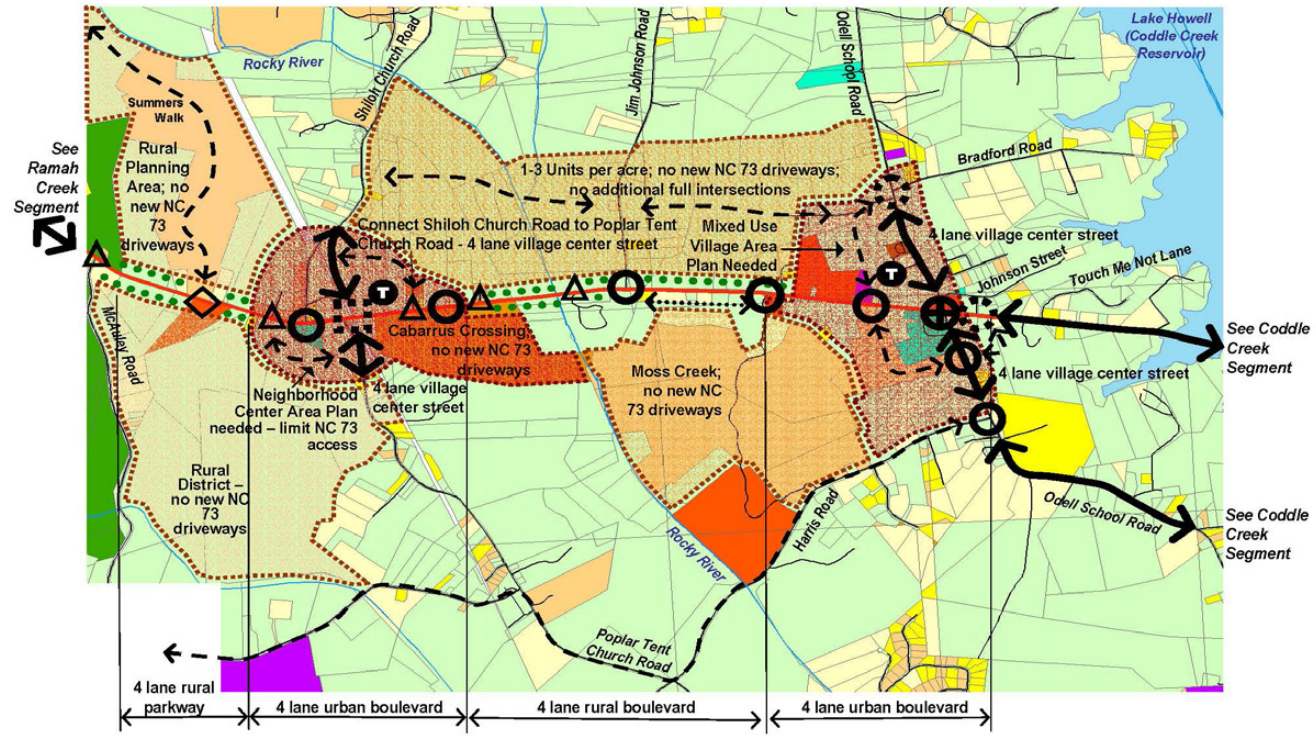
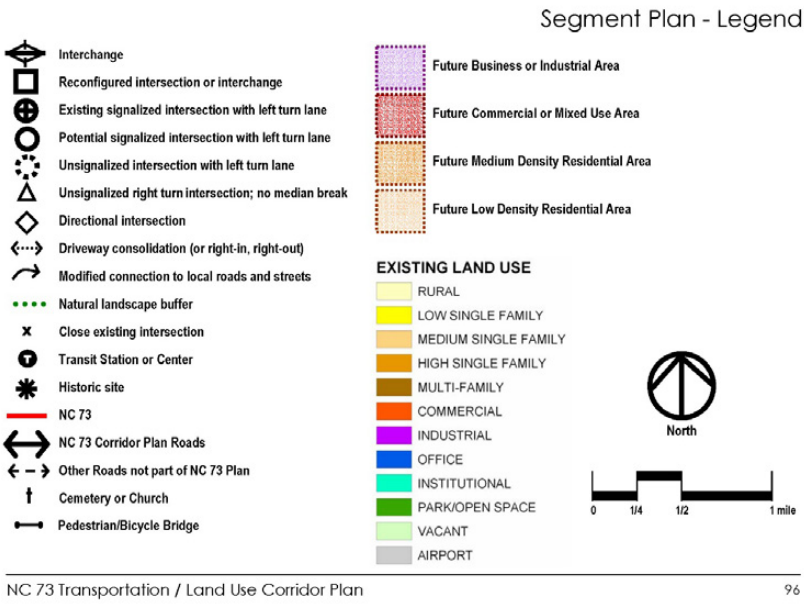


Figure 8 – NC 73 Transportation / Land Use Corridor Plan: Rocky River Segment



Segment Plan Legend

EVALUATING THE ECONOMIC IMPACT OF SHARED USE PATHS IN NORTH CAROLINA (2018)



The purpose of this study was to deliver research data that lays the foundation for the North Carolina Department of Transportation (NCDOT) to create new metrics for economic based performance criteria that assists non-motorized transportation projects to compete for NCDOT funding.

NCDOT has supported the construction of Shared Use Paths (SUPs) in coordination with local governments since the 1970's, but with the creation of a data-driven process to prioritize transportation projects, independent bicycle and pedestrian projects (like SUPs) are now evaluated, ranked, and in direct competition with projects from all transportation modes. The current prioritization process only uses travel time savings and safety benefits based on crash history as the economic criteria. But when we evaluate bicycle or pedestrian projects, these two economic metrics fall short in accounting for the wide range of potential economic benefits.

The objective of this study was to design and test a method for assessing economic contributions of SUPs in North Carolina. A variety of economic impacts were explored and were broken down into three distinct benefit categories.

- Societal benefits (health, congestion reduction, pollution reduction, safety benefits)
- Business benefits (trip expenditures, retail sales tax benefits)
- Community benefits (capital expenditures, operational expenditures, property value impacts)

The study sought to quantify economic contributions that SUPs provide through recreation and transportation uses and how these two activities may impact local and state economies. Economic contributions evaluated include:

- Tourism
- Events
- Urban redevelopment
- Community improvement
- Property values
- Health care savings
- Jobs
- Investment
- General consumer spending

To test the proposed methodology, four (4) shared use paths across North Carolina were selected.

1. The American Tobacco Trail in Durham
2. Brevard Greenway in Brevard
3. Little Sugar Creek Greenway in Charlotte
4. Duck Trail in Duck

And the findings resulted in five (5) categories of distinct benefits.

1. Business and Employee Benefits
2. Retail Sales Tax Benefits
3. Benefits from Capital Expenditure Investments
4. Property Value Impacts
5. Health, Congestion, and Pollution Reduction Benefits

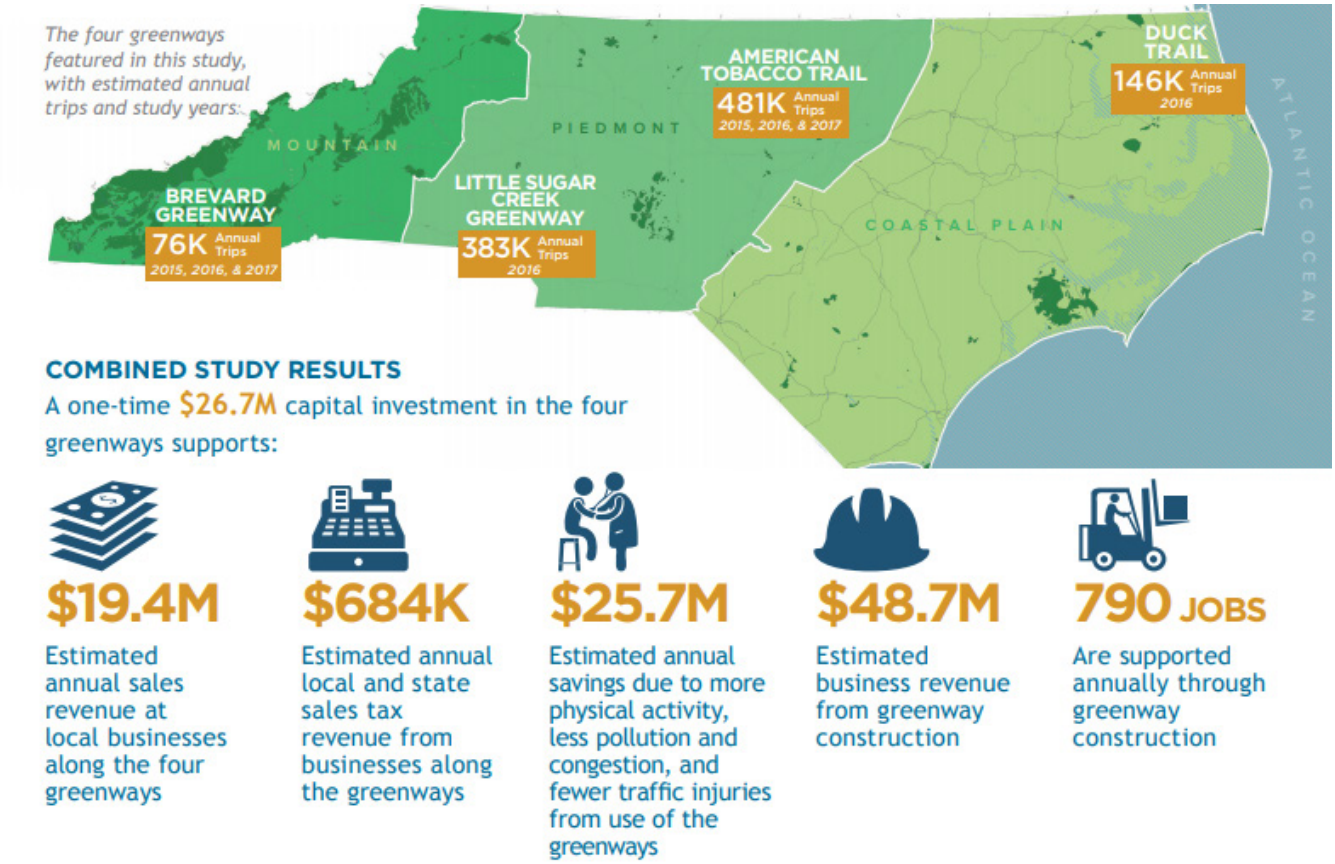


Figure 9 – Economic Impact of Shared Use Paths on Local Economies

CONCORD SMALL AREA PLANS

CLASSIC CONCORD CENTER CITY PLAN (2003)

Adopted by City Council in December 2003, the Center City Plan was a ten-year plan that established a set of strategies for future redevelopment and sustainability of fourteen (14) existing neighborhoods surrounding the City's downtown. Center City is defined as the area bounded by Interstate I-85, US Highway 3 (Branchview Drive), US Highway 601 (Warren C. Coleman Blvd.), and US Highway 29 (Concord Parkway).

The plan includes a Future Land Use Map, Multi-Modal Connections Map, Corridor Improvement Strategies, Neighborhood Improvement Strategies, and Development Incentives.

The strategies contained within the plan, both overall and area/neighborhood specific, were called out to be jointly implemented by public, private, nonprofit, and neighborhood organizations. Overall Center City strategies that directly support connectivity efforts include:

- Construct new sidewalks as shown on the Multi-Modal Connections Map (Figure X) each year, as feasible, through the City's Pedestrian Improvement Program (PIP).
- Construct additional greenway connections as shown on the Multi- Modal Connections Map (Figure X) to complete a greenway loop system throughout Center City.

The two corridors called out in the Center City plan are Cabarrus Avenue and Church Street. Strategies for the corridor improvements include: travel lane reductions, sidewalk construction, installation of landscape medians and protected left turn lanes, implementation of bike lanes and transit stops, burying existing utility lines, and installation of decorative street lights.

The plan also called out strategies for the 14 neighborhoods that were evaluated. The neighborhoods include:

1. Downtown
2. North Gate
3. Beverly Hills
4. Brookwood
5. Sidestown – Shankletown
6. Logan
7. Gibson Village
8. Historic Concord
9. Wilmar Park / Locke Mill
10. Hillcrest
11. Myers Park
12. Cumberland / Sylvan
13. Silver Hill
14. Hartsell

Within these neighborhoods, strategies that support connectivity efforts include:

- Install and/or repair sidewalks.
- Implement streetscape improvements.
- Construct Greenways (Three Mile Branch, Academy Creek) and promote opportunities for additional greenway connections.
- Create a main street in the Logan neighborhood with sidewalks, street trees, street lights, and traffic calming measures - connect Lincoln Street to Corban Avenue.
- Enhance connections of existing public facilities (parks, schools, etc.).
- Develop connection from R. Brown McAllister Elementary School to Les Myers Park.

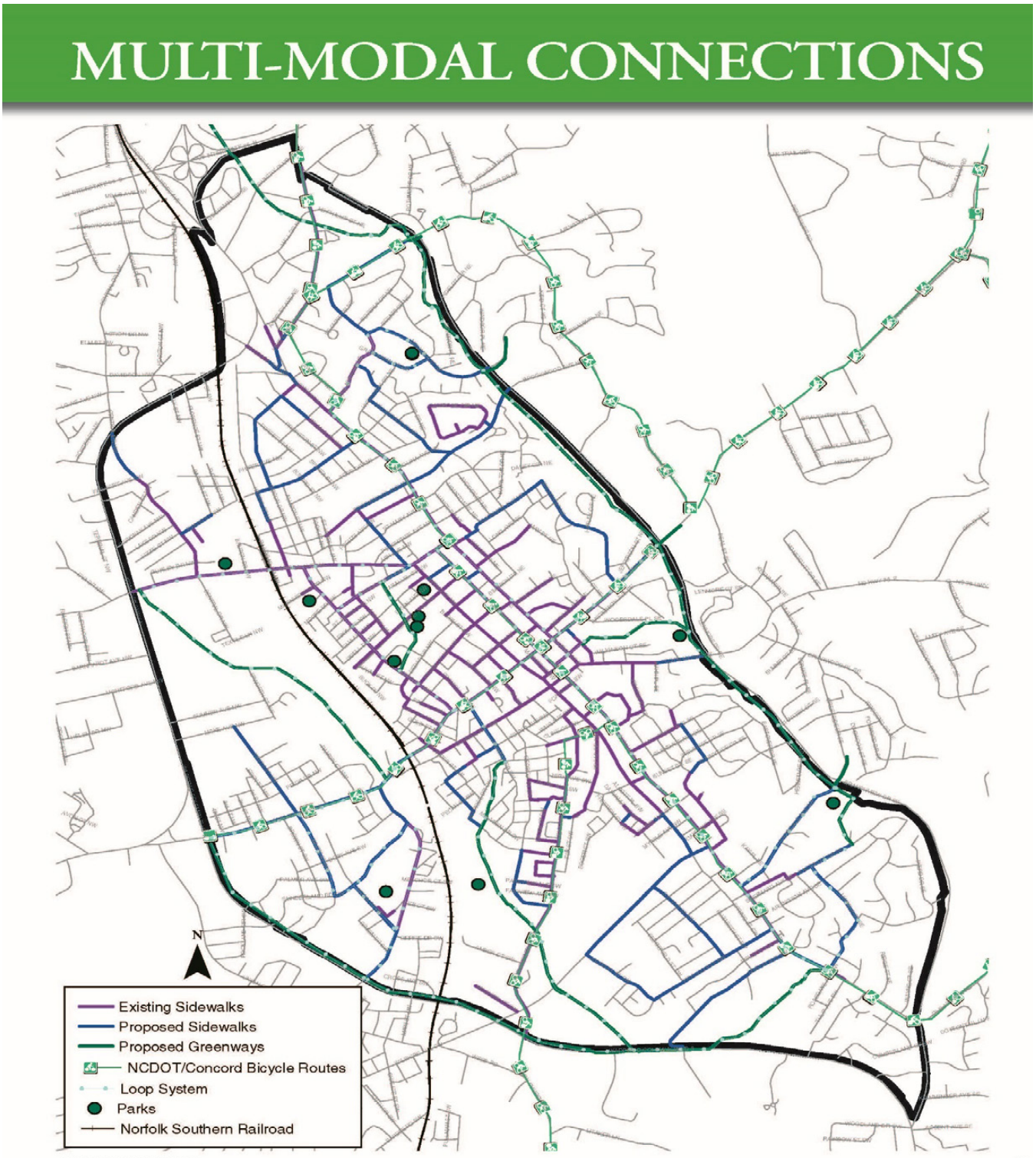


Figure 10 - Classic Concord Center City Plan – Multi-Modal Connections

CONCORD PARKWAY / ROBERTA CHURCH ROAD SMALL AREA PLAN (2005)



During the latter part of 2004, consultants collaborated with the City of Concord to develop a vision for 780 acres of primarily undeveloped land located between the Coddle Creek floodplain to the west, George W. Liles Parkway to Roberta Church Road to the east, Weddington Road to the north, and encompasses land on the south side Concord Parkway.

Adopted in 2005, much of the plan focused on the development of office, industrial, and retail elements with a portion of the vision outlining transportation and circulation recommendations; of which included pedestrian and bicycle route implementation. Key recommendations regarding these elements included:

- Adopt the recommended greenways and multi-use paths recommended in the small area plan
- Install a multi-use path along the Concord Parkway to provide for a regional northeast-southwest bicycle route
- Promote good street designs that provide enhanced bicycle and pedestrian accommodations

The master plan that was ultimately developed is divided into seven areas (see Figure X): Each of the individual areas have specific recommendations, several of which include and/or impact Connectivity elements, of which are listed below.

Weddington Neighborhood Center

- Install sidewalks and on-street bicycle lanes along both sides of Weddington Road.
- Construct a trail head from Weddington Road to the planned Coddle Creek Greenway.

The Neighborhood

- Preserve key open spaces noted on the plan including the floodplain/greenway and the neighborhood park.

Concord Farms Road South

- Construct a greenway trail with interpretive signage along the route of the Great Wagon Road.

School Site

- Continue the Great Wagon Road path along the northern boundary.

Concord Parkway Neighborhood Center

- Require a 100-foot informally planted setback with a 10-foot multi-use path along Concord Parkway.

Southside Employment Area

- Require a 100-foot parkway setback along Concord Parkway with a multi-use path.

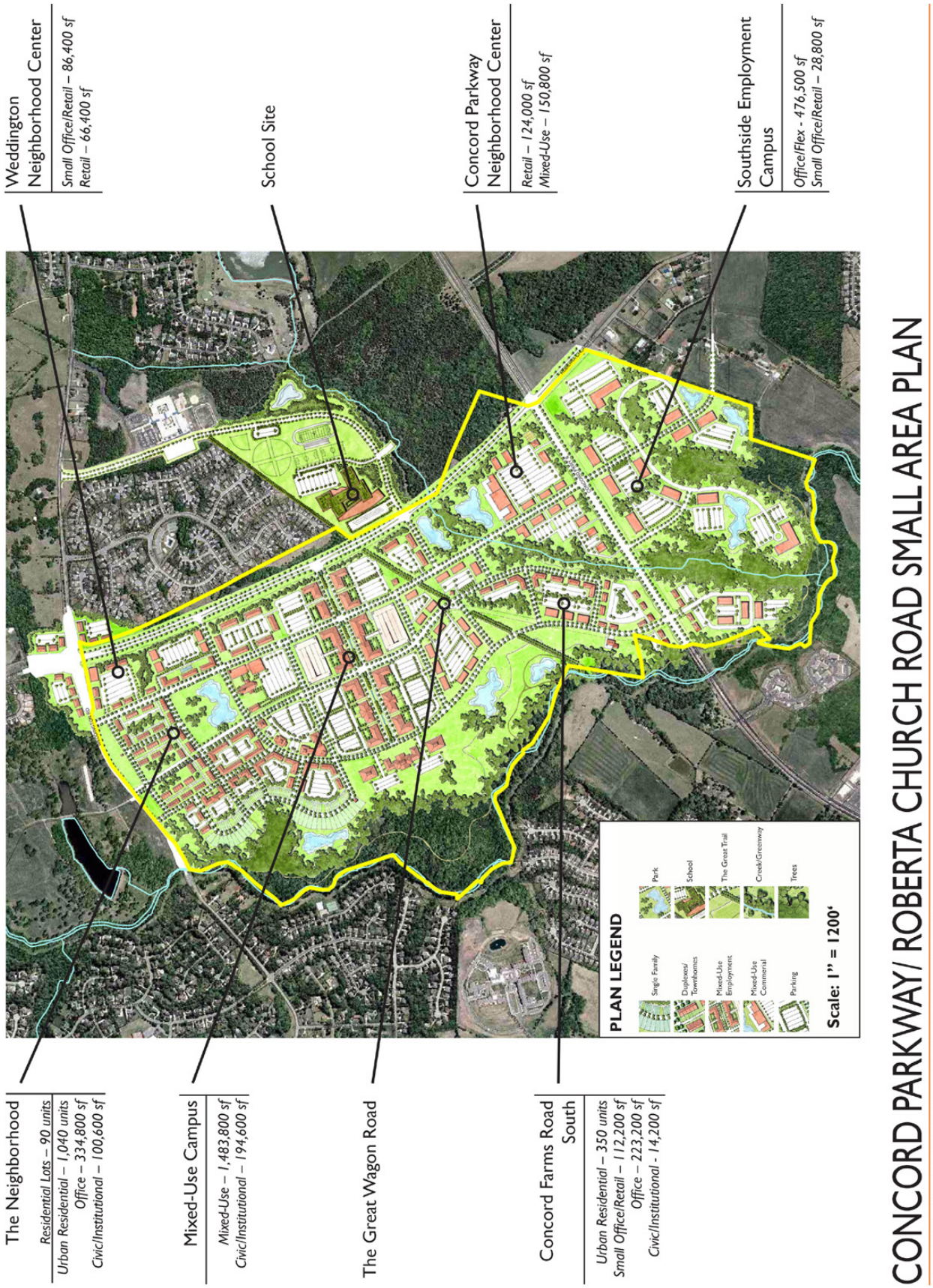


Figure 11 – Concord Parkway / Roberta Church Road Small Area Plan

CONCORD PARKWAY / WARREN C. COLEMAN SMALL AREA PLAN (2007)



The Concord Parkway (U.S. Hwy 29) / Warren C. Coleman (U.S. Hwy 601) Small Area Plan was adopted by the City Council in May of 2007. This plan addresses the future market demands for retail, commercial, open space, and residential uses within the study area for a twenty-year planning horizon.

The vision of the plan establishes a unique character for the area through architectural, streetscape, and development/redevelopment opportunities as well as promoting a walkable and pedestrian-friendly environment. Strategies contained in the small area plan regarding connectivity opportunities include:

- The streets within this area will balance pedestrian, bicycle, and vehicular needs through providing sidewalks on both sides of the street as well as constructing new sidewalks in the existing Mill Village by creating easements with the private homeowners.
- Promote the construction of a variety of parks, plazas, and open space for both active and passive recreation. Such open spaces should include a regional trail system.
- Promote the connectivity of the different open spaces through improved streetscape, sidewalks, and lighting.
- Promote the construction of a regional trail system along the existing streams and creeks as a requirement for new development.

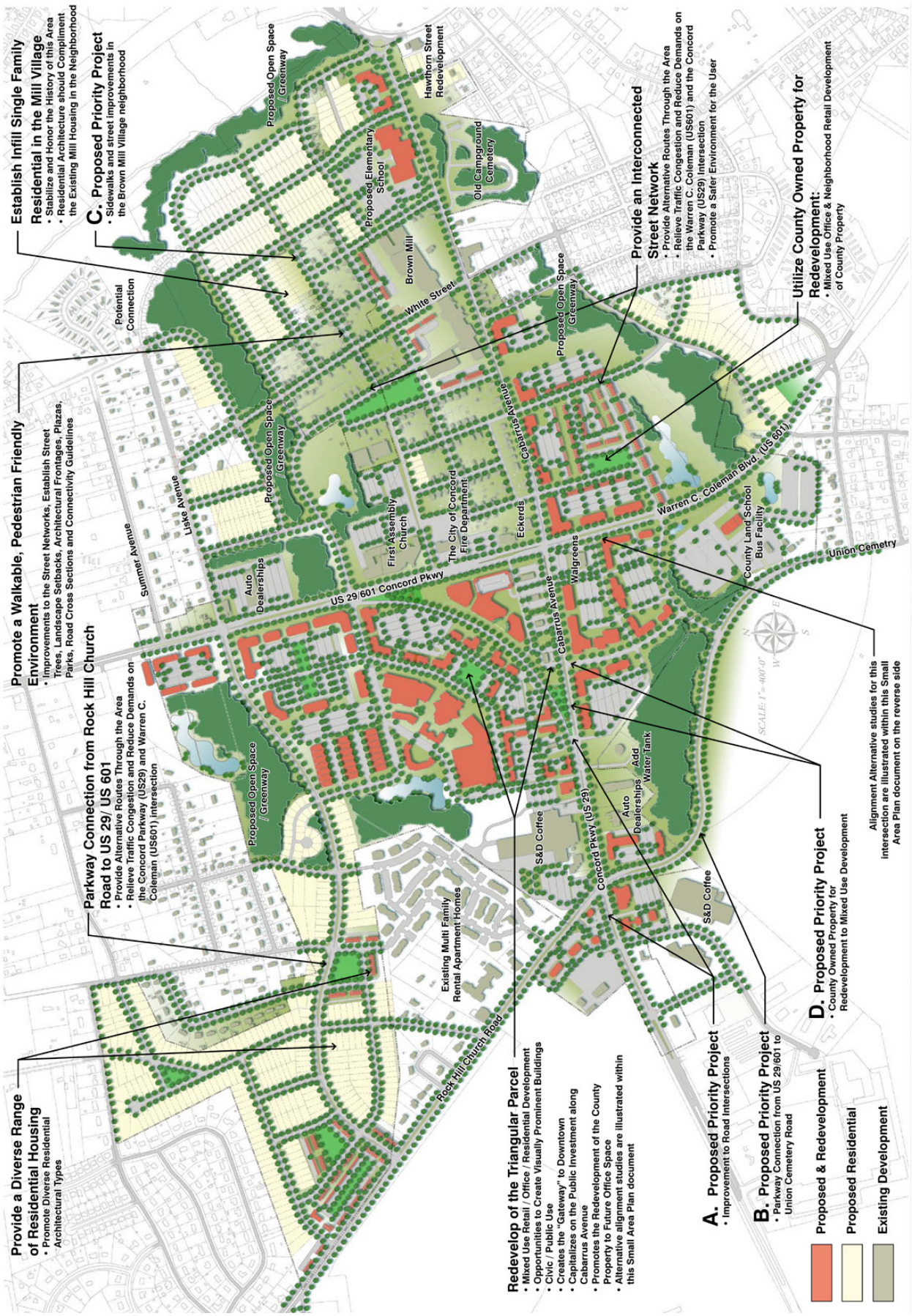
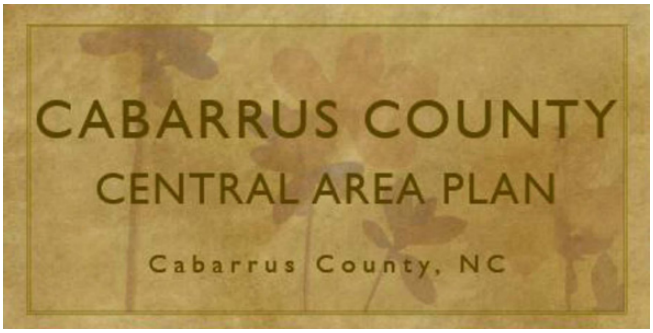


Figure 12 – Concord 2025 – Concord Parkway (US 29) / Warren C. Coleman (US 601) – 20 Year Small Area Plan

CABARRUS COUNTY CENTRAL AREA PLAN (2008)



The Cabarrus County Central Area Plan, adopted in 2008, was created in response to the County's need for a better way to manage growth and its impacts within the central portion of the County. Cabarrus County, located along the growing I-85 corridor northeast of Charlotte, has experienced rapid growth, especially within the I-85 corridor.

However, unlike the I-85 corridor, the central area of the county is less developed. Lying on the east side of Concord and bordered by Rocky River Road and Cold Spring Road, the Central Area study area encompasses County land and land lying within the jurisdictions, ETJs and spheres of influence of Concord and Kannapolis. The plan establishes a vision for future growth and development, sets standards for achieving quality growth, and establishes a framework for consistent land-use planning and growth management.

This plan is intended to guide decisions that prioritize public investment decisions particularly in conjunction with public infrastructure. In doing so, such investments may be made to direct growth in a manner that is consistent with the community's long-range vision. Serving as a policy guide, the plan provides the information required to make informed decisions and to define growth management tools.

Some recommendations provided within the study relating to or specifically addressing pedestrian and bicycle connectivity include:

Developing enhanced standards for all cluster subdivisions including:

- Sidewalks (both sides of the street)
- Connectivity

Preparing new Urban Village District(s) (for Mixed-Use Areas) including standards as follows:

- Wider sidewalks
- Pedestrian-friendly intersections
- Multi-modal, pedestrian-friendly streets

Creating collector street connections.

- The rapid rate of growth within the study area paired with limited transportation alternatives suggests that the study area would benefit from a more robust collector street network. Generally, collector streets have two travel lanes often with dedicated left turn lanes at major intersections. A properly implemented collector street system improves accessibility to higher intensity residential areas and activity centers. They also allow free movement of bicyclists and pedestrians.

Providing greenways and other facilities for enhanced mobility for bicycles and pedestrians.

- Development of the study area into commercial centers and neighborhoods requires a transportation system that includes opportunities for non-motorized trips, both functional and recreational. Existing large-scale transportation facilities act as barriers to this type of movement. Opportunities do exist that enhance transportation connectivity beyond the typical large-scale street cross sections. As such, the study team developed mobility strategies to accommodate bicycle and pedestrians. By overlapping preferred destinations, existing and planned routes, and stream corridors, a system of greenways, trails, and on-street bicycle routes were identified. These non-motorized routes represent a strategy to connect people with places in a safe and inviting environment.

Supporting transportation improvement projects of regional significance.

- Eastern Bypass - The Eastern Bypass, proposed in the northern section of the study area, generally follows a path extending from NC 49 along Crestmont Drive, north to Penninger Road, eventually extending to I-85. This proposed roadway appears on the Cabarrus-Rowan Metropolitan Planning Organization's (CRMPO) adopted 2030 Long Range Transportation Plan (LRTP). The location of this roadway has the potential to create access opportunities for much of the northern portion of the study area while enhancing mobility area-wide.
- However, most residents questioned the need for the bypass. The community may challenge the need for the proposed bypass, and if they do, Cabarrus County as a member of the MPO, may request the corridor be removed during the update to the LRTP.
- However, should the bypass remain as part of the plan, participants in the planning process widely agreed that the street design should accommodate the rural context through which it passes. Bicycle and pedestrian amenities would be considered as a part of the street concept, with a side path/greenway (rather than sidewalks) to work within the larger greenway strategy and enhance the area's rural character.

Support regional greenway initiatives that provide long-term connectivity.

- Seek land dedication through the private development process to establish connected greenway system over the long-term.

CONCORD TRANSPORTATION PLAN

The Concord Transportation Plan is the City's authorized long-range transportation document for local transportation improvements (roadways, pedestrian, and bicycle). The City of Concord Transportation Plan Map (for both roadways and pedestrian and bicycle facilities) is a component of the Cabarrus-Rowan MPO Long Range Transportation Plan (LRTP).

As land use plans change and roadway networks expand as development occurs, and as planning documents from adjacent jurisdictions, the State and the MPO are modified, Concord's current Transportation Plan is evaluated to identify potential revisions to street classifications, future roadway alignments, and/or pedestrian and bicycle facilities. As part of this revision process, public comment is essential in providing a complete, comprehensive, and up-to-date Transportation Plan.

BLUE CROSS / BLUE SHIELD – MUP ECONOMIC IMPACT STUDY (2005)[1]

This study provides an example of a simple approach to cost-benefit analyses, comparing the medical benefits of physical activity to trail investment. The purpose of this study was to provide an economic argument for the implementation of trails as a public health measure by comparing the cost of trail construction and maintenance to reduced medical expenses of trail users.

This was a study conducted by staff with the Centers for Disease Control and Prevention and the Nebraska Health and Human Services System in Lincoln, Nebraska. The study compared five cycling and pedestrian trails in Lincoln, ranging in length from 1.6 to 4.6 miles.

Benefits of physical activity was measured as the difference between average medical expenses for active versus inactive persons (using national expenditure data from the National Medical Expenditure Survey). "Active" persons are defined as those who get at least 30 minutes of moderate or strenuous physical activity per week. It was assumed all trail users are on the trail three times per week, every week of the year. An existing trail study conducted in 1998 was used to extrapolate data regarding average daily trail use and annual construction and maintenance costs. Costs per user were calculated as annualized construction and maintenance costs, divided by the estimated number of people using the trail. However, due to some oversimplified assumptions, the benefits per dollar of trail investment may be overstated.

Findings derived from the study concluded that:

- Each year, the average trail user has $564.41 in benefits from reduced medical care due to increased physical activity.
- Each year, across the five trails studies, trail maintenance costs an average of $4,314 per mile, ranging from $3,329 to $5,692.
- Initial trail construction cost an average of $12,555 per mile, ranging from $708 to $19,855.
- Assuming the annualized trail construction and maintenance costs are borne by trail users only, and trail users would otherwise not be physically active; every $1 investment in trails is associated with $2.94 in benefits.

1 Wang Guijing., et.al, (2005). A Cost-benefit Analysis of Physical Activity Using Bike / Pedestrian Trails. Health Promotion Practice, 6 (2), 174-179. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/15855287.

CITY OF CONCORD 2030 LAND USE PLAN (2018)

The 2030 Land Use Plan sets the direction for Concord to proactively manage change over the next 10 to 15 years. One of the key issues that the City will be focusing on is how to address the interface between land use and transportation by providing multimodality and connectivity throughout the City.

Like most growth, there are challenges and opportunities that must be considered. Those that are specific to connectivity are listed below.

Enhancing mobility between residential, employment, commercial, and recreation uses. Improving connections between the places where residents live, work, and play will be a key challenge that can only be met through better integration of land uses and the establishment of connections between uses for all modes of transportation. Narrow rights-of-way constrain opportunities to establish complete streets along many arterial street corridors, which increasing the importance of coordinating land uses and ensuring that their designs facilitate better mobility.

- Providing adequate recreational facilities for an expanding population. The City of Concord will endeavor to improve its standing among its peer communities in the categories of Trail Miles per 1,000 Residents and Total Park Acres per 1,000 Residents by identifying and acquiring future park sites and encouraging Mixed-Use Activity Centers to include live, work, and play elements during the development review process.
- Identifying and building multimodal corridors. While Concord's transportation system has been effective at addressing capacity demands of new growth, the roadways themselves are often lacking in multi-modal facilities/amenities that would support use by transportation modes other than the single occupant vehicle. This lack of facilities/amenities can inhibit desired development types that depend on maintaining access while supporting alternative modes.
- Developing a safe and effective bicycle/pedestrian network. The transportation system provides connectivity between the unique assets and character areas located throughout the Study Area. This system, now almost entirely designed to support automobile transportation, must evolve to expand and enhance opportunities for bicycle/pedestrian modes. These enhancements will provide a viable transportation option for those who wish do not wish to drive (or may not have access to a car), provide a network that can be utilized by the community to support exercise and public health, increase safety for bicyclists/pedestrians, and support economic development by providing non-automobile connections to retail and cultural centers throughout the Study Area.
- Reinforcing the Concord Unified Development Ordinance to address the greenway dedication of land or fee in lieu when a residential development is submitted for approval.
- Preserving open space through greenways and parks.

Within the LUP, there is a growth vision based on distinct Character Areas, Activity Centers, Multimodal Corridors, and Existing/Proposed Greenways. The LUP 2030 Growth Concept Plan illustrates this vision. Definitions of those distinct areas that reach into overall connectivity elements can be seen on the following pages.

Character Areas

Character Areas identify specific areas that, due to existing/expected development pressures, are likely to be focal points for growth and development in Concord through 2030. Each character Area has different qualities and a role to play in the creation of a more connected and livable Concord. Character Areas that deal directly with connectivity issues and solutions include:

- Downtown Character Area
- Central Concord Character Area
- Entertainment Corridor Character Area
- Medical Center Character Area
- Airport Industrial Character Area
- International Drive Industrial Character Area
- Conservation Residential Character Area
- Western Gateway Character Area
- Mixed Use Corridor Character Area

Each Character Area provides recommendations regarding Concord's connectivity. Those recommendations include:

Central Concord Character Area: Extends southwest along Concord Parkway (US 29) from Wolf Meadow Branch (west of the Wal-Mart Super Center) past the corridor's intersection with Pitts School Road

- Maintain Concord Parkway as an attractive corridor that serves as a primary gateway to Downtown Concord.
- Serve a mix of travel modes along Concord Parkway, including motorists and transit (both bus and the long-term potential for light rail/commuter rail), bicyclists, and pedestrians (particularly within the activity centers).
- Provide multi-modal connections between uses within the activity centers.

Downtown Character Area: Encompasses Concord's traditional core as well as easternmost sections of the Center City: approximately from Brookwood Avenue on the north to Lawndale Avenue on the south, and between Union Street and Branchview Drive, to Cold Water Creek along Cabarrus Avenue and Irish Buffalo Creek along Cabarrus Avenue.

- Add to the inventory of assets such as new public art, wayfinding, the Downtown Greenway Loop, bike lanes, and improved transit service.
  - Continue efforts to complete the development of the Harold B. McEachern Greenway north of the currently planned extension.
- Step up the completion of multimodal infrastructure, particularly sidewalks and bike lanes, linking the in-town neighborhoods to the City's historic core.
- Continue implementing relevant strategies of the Center City Master Plan for the corridors and neighborhoods along Church Street, Cabarrus Avenue, and Corban Avenue.
  - Ensure that community amenities, public facilities, and services are equitably distributed within walking distance of everyone in the neighborhoods.

Entertainment Corridor Character Area: Concord Mills/Bruton Smith Boulevard to the east side of I-85 and the Charlotte Motor Speedway.

- Improve access within the corridor for visitors. While there are many hotels within this corridor (most of which are clustered to the east of I-85), trips to anything other than the abutting restaurants require vehicular travel. While improved bike and pedestrian facilities are needed, transit service connecting the hotels to motorsport facilities to the east and Concord Mills to the west could alleviate congestion.

Medical Center Character Area: extends between I-85 and Davidson Highway (NC 73), east to the junction with Concord Parkway, and beyond along the south side of the Lake Concord Road and Copperfield Boulevard corridor to the City boundaries.

- Expand the sidewalk network and add bicycle routes, particularly where they can safely connect to the major employers and to the Transit Center, as well as connections to the surrounding residential areas.

Airport Industrial Character Area: adjacent to I-85, Poplar Tent Road and Derita Road.

- Provide safe, continuous pedestrian and bicycle facility networks to promote direct access to nearby residential, non-residential, public uses, and transit service to jobs.

International Drive Industrial Character Area: located within the proximity of Interstate 85 at the Davidson Highway (NC 73) exit (Exit 55).

- Provide for continuous pedestrian and bicycle facilities. It is important to provide safe, comfortable, and convenient connections to allow the opportunity for employees to utilize the alternative transportation methods to get to and from work, and between buildings.

Conservation Residential Character Area: generally located between Hwy 49 (northern bound), Flowe's Store Road (eastern bound/ southern bound), Rocky River Road (western bound), Pine Grove Church Road (southern bound), and in the vicinity of Zion Church Road.

- Contiguous open space can be owned by the homeowner association. Depending on the location, subdivision layout, and the topography, the common/contiguous open space may be reserved for natural areas, park amenities, greenways, greenbelts or where sufficient buffers are provided, agricultural uses.

Western Gateway Character Area – extends from Cox Mill Road to Huntersville and encompasses Highland Creek and other suburban residential developments.

- Encourage interconnectivity. Through the zoning process, the City should encourage connectivity between existing and future single-family neighborhoods. This will allow for improved alternative transportation options and reduce traffic impacts on existing City roads.
- Complete the greenway system. There are plans for the Western Gateway area to provide major greenway connections heading west and north out of the City of Concord. The City should require properties to set aside for future development and acquire properties as needed to complete this greenway network.

Mixed-Use Corridor Character Area: Mixed-use development typically puts complementary uses, such as housing, commercial, industrial or government uses, within walking distance of each other. Mixed-Use Corridors encompass not only the roadway and the land in the right-of-way, but also areas extending out from anywhere between a block or two, to a quarter of a mile or more, depending on the location and the urban structure and character of the area. Mixed-Use Corridors should have strong pedestrian and bicycle networks and be well connected to the surrounding residential areas and to employment areas.

The Mixed-Use Corridors include:

- Concord Parkway (US 29)
- Warren C. Coleman Boulevard (US 601)
- Bruton Smith Boulevard and Davidson Highway (NC 73)
- US 49
- George W. Liles Parkway and Copperfield Boulevards
- Poplar Tent, Pitts School, Weddington, and Derita Roads

Activity Centers

Activity Centers represent existing major attractors throughout the community whose continued evolution will greatly affect the surrounding areas. These Activity Centers serve as anchors for most of the Character Areas.

Multimodal Corridors

The designated Multi-modal Corridors are identified as existing important automobile-oriented transportation corridors that connect between Character Areas as well as to the larger region. These corridors are identified as either Primary Corridors or Secondary Corridors depending on their size and importance to the transportation system. The 2030 Plan identifies Multi-modal Corridors as opportunities for incorporating multi-modal features (bike lanes, transit service, sidewalks/trails) and more transit supportive land use patterns through corridor planning and zoning changes. Ultimately the development of these corridors consistent with multi-modal principles will help create a more coherent development pattern between Character Areas while encouraging travel using alternative modes.

Existing/Proposed Greenways

Concord has an extensive plan to develop a comprehensive network of greenways. As shown on the Growth Concept, these future greenways will help reinforce connections between Character Areas and Activity Centers which will provide real options for bicyclists and pedestrians to safely travel through the City.

A major component of the LUP was establishing goals, objectives, and policy guidance that will guide Concord as it continues to grow. Below lists the goals, objectives, and policy guidance found within the LUP that directly correlate to a connected transportation system.

Goal 2: Enhance mobility for all modes of transportation between the places where people live, work, shop, and play (refer to Part 7 for additional policy guidance relating to mobility).

- Objective 2.1: Ensure that new development is designed to provide users with mobility choices, including driving, walking, bicycling, and riding transit.
  - Policy Guidance for Objective 2.1:
    - Complete Streets: Modify development and street design standards to require complete streets that serve all users.
    - Transit/Bike/Pedestrian Support: Use a combination of design standards and incentives to ensure that building and site development supports all applicable modes of transportation to and within development sites.
- Objective 2.2: Ensure that new development includes interconnected road systems and enhances connectivity to existing development where it safely enhances mobility.
  - Policy Guidance for Objective 2.2: Use a combination of design standards and development incentives to achieve site and subdivision designs that improve mobility within and between developments through a combination of streets, bikeways, and multipurpose trails. As part of the bike and pedestrian support referenced under Objective 2.1, the City's action on public and private development initiatives should foster the completion of a continuous greenway and trail system.

Goal 3: Retain Concord's small-town atmosphere and continually enhance the quality of life as the City grows.

- Objective 3.1: Regulate the scale and design of development to promote walking and biking within residential and mixed-use areas.
- Objective 3.4: Enhance Concord's quality of life through efforts to support neighborhood vitality. This may include

a combination of complete street improvements, improved access to parks and recreation facilities and community centers, improved transit access, housing rehabilitation efforts, active code/property maintenance enforcement, greenway or greenbelt improvements, and/or improved neighborhood services and amenities.

- Policy Guidance for Objectives 3-1, 3-4: The strategies for neighborhood enhancement should be tailored to the needs of each affected neighborhood and determined with the input of affected residents and business owners. Support adaptive reuse of existing building stock.

Goal 5: Provide for adequate infrastructure and services for residents and businesses.

- Objective 5.5: Coordinate the expansion and development of greenways that can be used for bicycle and pedestrian corridors with the development review and capital improvements planning processes.
  - Policy Guidance for Objectives 5.5: Secure and improve greenways as vital transportation improvements through the development and capital improvements processes in coordination with the Comprehensive Parks and Recreation Master Plan.

Goal 6: Protect natural resources and retain open spaces for future generations.

- Objective 6.2: Protect the natural resource base of the City and surrounding areas through a combination of strategic acquisitions, open space preservation requirements within new development and incentives for private land preservation initiatives.
  - Policy Guidance for Objective 6.2:
    - **Acquisition:** Acquire lands along river corridors and within riverine buffers as corridors to link greenways and open space and provide for their preservation through the development approval process.
    - **Partnerships:** Seek partnerships and funding to develop an inter-connected greenway system throughout the community and region. Support the efforts of land trusts and conservation groups as they acquire parcels of land for conservation.

Goal 10: Encourage and promote multi-modal connectivity between residential, employment, commercial, and recreational uses.

- Objective 10.3: Increase the provision of sidewalks and other walk/bike infrastructure.
  - Policy Guidance for Objective 10.3:
  - Develop a program and/or material to educate the public and development community about the CDO requirements for sidewalks in new developments and the importance of pedestrian connectivity more generally.
  - Planning and Community Development Department should work with the City's Transportation Department to identify key sidewalk system "gaps" that could be connected to greatly enhance connectivity between residential neighborhoods to recreation, schools, and other amenities.
  - Coordinate with the Parks and Recreation Department to implement the City's Comprehensive Parks and Recreation Master Plan and the findings of the Open Space Connectivity Analysis with a focus on connectivity and regional bicycle/pedestrian corridors.
  - Designate the routes identified in the Livable Community Blueprint as priority routes to pursue in the development of safe and user-friendly pedestrian and bicycle corridors.
  - Encourage new developments to incorporate off-road facilities for bicycles and pedestrians.

- On an on-going basis, seek partnerships and funding to develop an inter-connected greenway system throughout the community and the region.
- Develop a bikeway system plan (bike lanes, shared lane markings, etc.) with prioritized improvements to coincide with roadway expansions (widening) and repaving

› Objective 10.4: Provide a transportation system that efficiently and safely serves the current and future needs of Concord citizens.
- Policy Guidance for Objective 10.4:
  › Implement the Concord Transportation Plan for local roadway improvements and multi-modal and pedestrian-friendly corridors.
  › Implement the Cabarrus-Rowan MPO 2040 Metropolitan Transportation Plan recommendations for bicycle and pedestrian improvements, rail transportation, transit and public transportation and congestion management, and traffic monitoring for facilities in the Concord area.
  › Support the NC 73 - Transportation/ Land Use Corridor Plan to improve the roadway to become a multi modal and pedestrian-friendly corridor.
  › Accommodate pedestrians and bicycles into most of the road typologies. Trees are located between the roadway pavement and sidewalks wherever possible, to provide a safe and attractive pedestrian environment.

Goal 11: Provide a high quality, diversified parks, recreation and open space system that provides for all age and interest groups.

› Objective 11.1: Expand and develop parks and recreation facilities to serve the needs of the citizens of Concord.
- Policy Guidance for Objective 11.1:
  › Implement the City's Parks and Recreation Master Plan to improve and expand existing parks and facilities and develop new parks and facilities.
  › Provide parks and recreation facilities in underserved areas.
  › Focus on building facilities and/ or adapting/expanding existing facilities to accommodate users with physical and developmental disabilities.
  › Develop passive parks including opportunities for trails, picnicking, camping and nature study.
  › Use the Growth Concept and Future Land Use Map to identify opportunities for future parks and potential greenway connections.
  › Reinforce the CDO to address the greenway dedications/reservations when a residential development is submitted for approval.
  › Create greenway design standards to require developer-funded greenway construction on site when consistent with the Comprehensive Parks and Recreation Master Plan.

› Objective 11.2: Improve access to existing parks, open space and recreation areas.
- Policy Guidance for Objective 11.2:
  › Continue to develop the planned city-wide network of pedestrian and bicycle facilities, greenways and trails.
  › Amend the Concord Development Ordinance to ensure that land is reserved for linking existing and future parks and open space to the greenway system.
  › Adopt a "whole access" policy for parks and trails to provide recreation for all regardless of physical ability.
  › Increase transit accessibility to parks by considering stops on existing or new routes within no more than a 10 minute walk of a park.

Goal 12: Preserve natural resources and open space.

- Objective 12.1: Promote the preservation of open space throughout the City.
  - Policy Guidance for Objective 12.1:
    - Acquire lands along river corridors and within riverine buffers as corridors to link greenways and open space.
    - Seek partnerships and funding to develop an inter-connected greenway system throughout the community and region.
    - Protecting our abundant natural resources gives us a unique opportunity to rally several goals with the potential to positively impact the quality of life for residents across generations.
    - The potential financial impacts (often counted in millions of dollars of economic activity) include business and job creation, enhanced community character and demand for housing and lodging as a result of increased tourism; attraction and retention of young talent with a broader array of quality amenities; and increasing property values resulting from proximity and access to parks and open space.
    - Protecting our natural areas and resources has other significant public benefits. Undeveloped and protected natural areas can reduce costs for public infrastructure, help improve water and air quality, reduce risk and protect people and property from storms, flooding and other natural and man-made disasters.
- Objective 12.2: Protect the natural resource base of the City and surrounding areas.
  - Policy Guidance for Objectives 12.2:
    - Work closely with neighboring jurisdictions, local and state agencies, and citizens groups to promote the protection of the community's water resources.
    - Continue to participate in regional air quality monitoring efforts and encourage compact development and the development and use of alternative transportation.
    - Objective 12.4: Explore creating a comprehensive green infrastructure plan, combined with Low Impact Development strategies to address stormwater management and integration with the greenways and trails system.
    - Policy Guidance for Objectives 12.4:
    - Maintain 20-foot buffer for trails along streams to help prevent erosion from the stream banks.

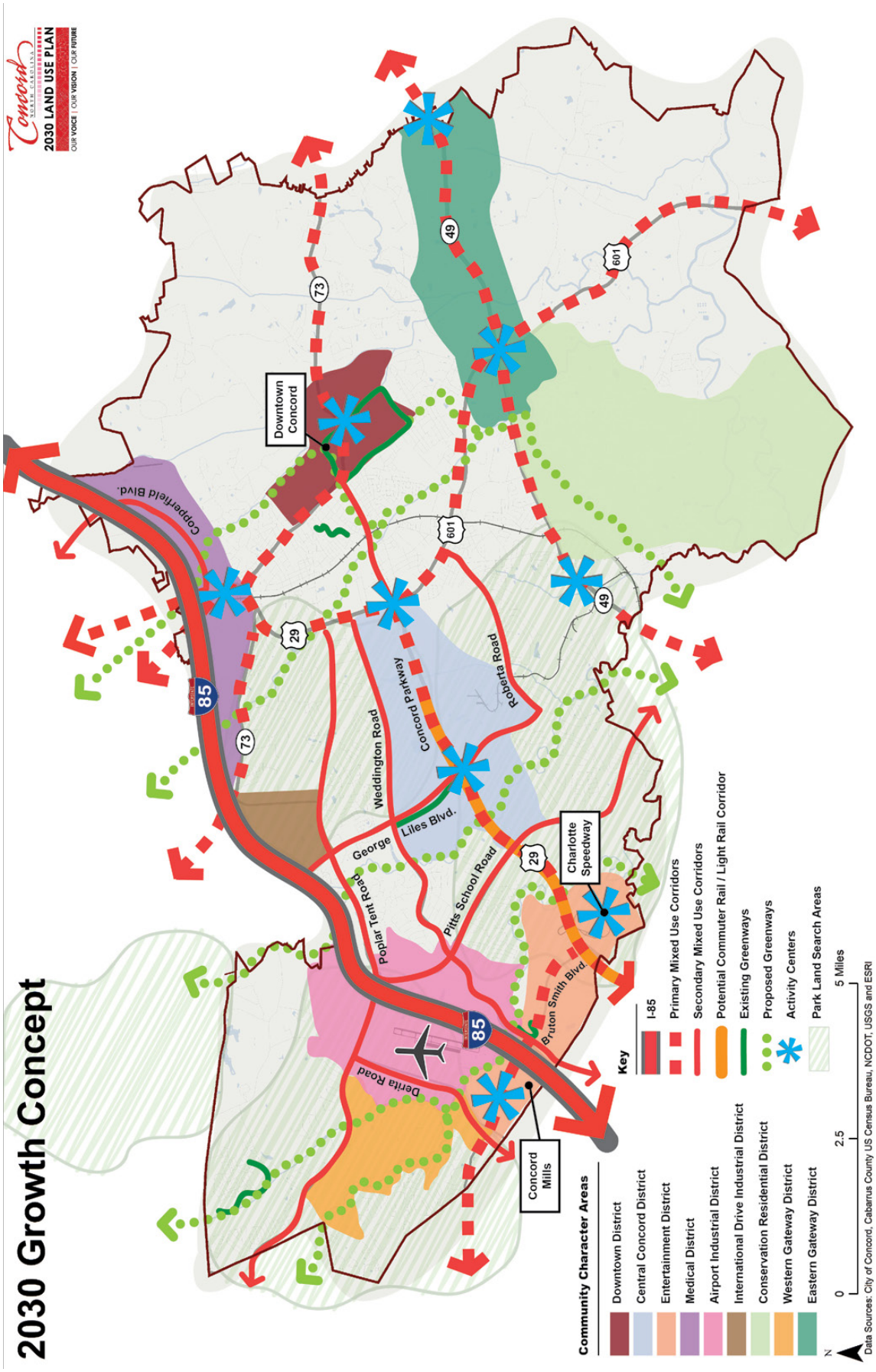


Figure 13 – LUP 2030 Growth Concept Plan

CABARRUS COUNTY NC – HEALTHY COMMUNITY DESIGN WORKSHOP (2018)

In May of 2018, Mark Fenton facilitated a Healthy Community Design Workshop with Cabarrus County. These workshops connect the design of a community to the overall health impact of its residents. The goal of the workshop is to impart upon participants the connections between urban design and your health, to explore the existing design challenges in the community, and to create strategies that address the issues. Concord's workshop developed both short- and long-term recommendations for programs, projects, and policies.

For this study, we are focusing on select project and policy recommendations.

Project – Short Term:

- Create wayfinding that connects residential areas to routine destinations. Start with low cost treatments, and partner with a "virtual" wayfinding system through social media. Be sure to include specific wayfinding to parks and schools
- Support walking to destinations and build the local culture of walking through creating a series of pop-up walking routes (e.g. close a roadway travel lane to create a short-term walkway; temporarily improve a missing crosswalk) to key destinations so that people can get a sense for the ease and proximity of walking destinations.

Project – Long Term:

- Implement the full infrastructure recommendations of the connectivity analysis; consider innovative funding approaches to make these a reality.
- Create viable and sustainable active transportation infrastructure funding. Most important is routine Complete Streets accommodation. But also consider specialized funding, such as passing a community referendum (e.g. ½ cent sales tax surcharge) for roadway repairs and improvements.
- Launch a mini-grant program (e.g. funded by health, transportation, and planning agencies) to support pop-up and demonstration transportation projects.

Policy – Short Term:

- Assess issues (e.g. through walk audits and community input) with site designs of existing schools, focusing especially on links from pedestrian facilities to and around the building, across parking lots, to playgrounds and fields, bicycle parking, and other elements challenging to pedestrian and bicycle safety and access.
- Expand developer requirements to put in greenways and pedestrian and bicycle infrastructure as part of the essential elements for subdivision development; this should be part of routine accommodation across the county, as should links to nearby greenway segments and on-street facilities.
- Institute and require Multi-Modal Transportation Analysis (MMTA) on all projects that would normally require Traffic Impact Analysis (TIA). This requires developers and agencies to estimate not just motor vehicle, but also best-case pedestrian, bicycle, and transit trips associated with new or redevelopment, and to recommend appropriate remediation.

Policy – Long Term:

- Reflect long-term walk audit recommendations (e.g. major infrastructure improvements, greenway trail segments, etc.) in all planning documents and the associated capital budgets.
- Complete Streets policy implementation – Include a CS design review for all routine maintenance such as paving and painting programs, as well as for all other utility work that disturbs streets. This should provide many opportunities for low- or no-cost CS improvements.
- Create a higher prioritization for pedestrian & bicycle accommodations, and therefore the associated funding. Make it a stated policy goal: design bike facilities to accommodate the 60% of users defined as "interested but concerned."
- Update zoning requirements to stop creating sprawling malls, but instead create mixed-use, walkable villages & centers.



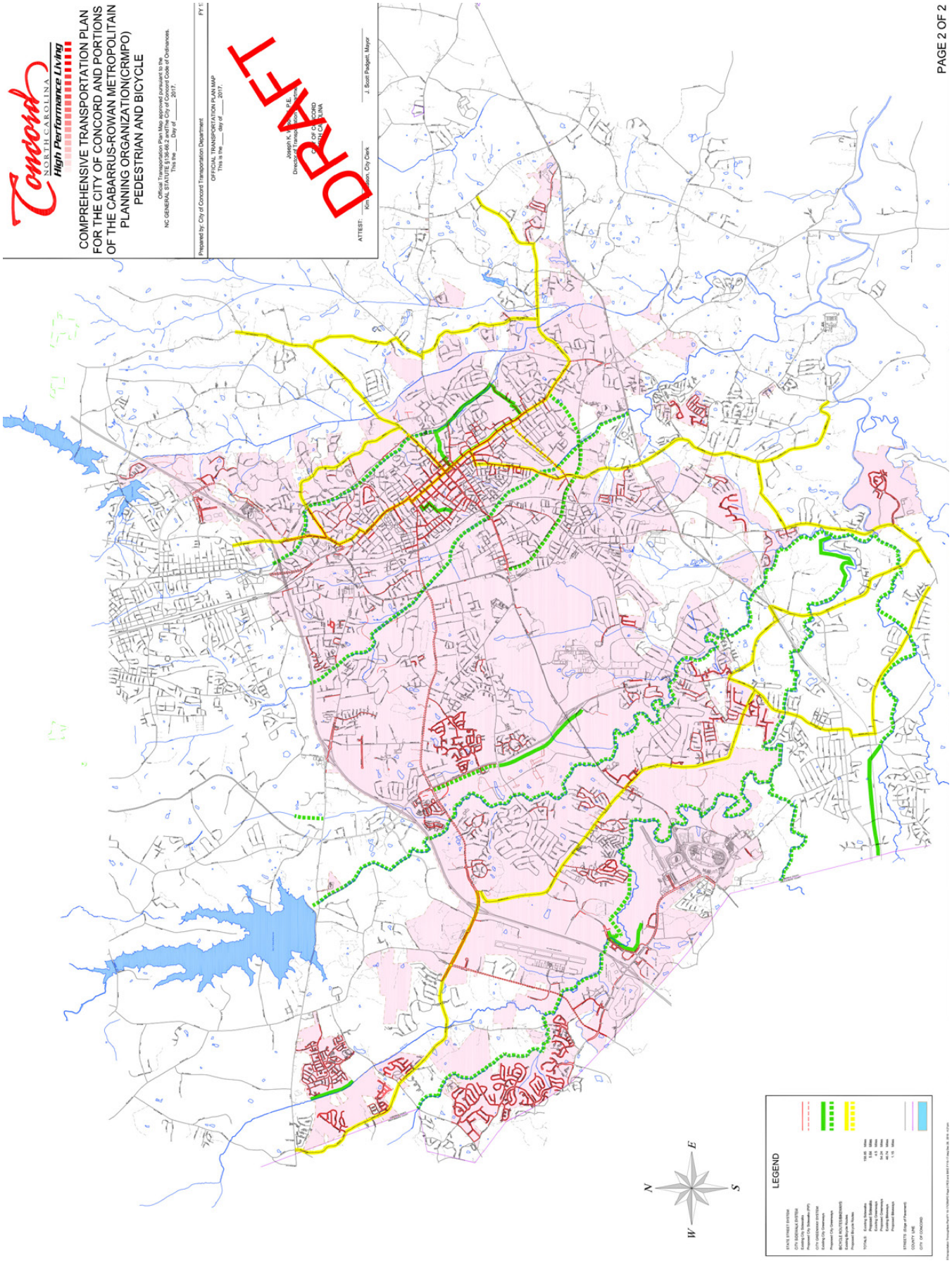


Figure 14 – Concord Transportation Plan – Pedestrian and Bicycle Map

LOCAL POLICY

Although limited usage of the term "greenway" can be found in the Concord Development Ordinance (CDO), the ordinance does require open space and parks be provided in new residential developments. Article 10 - Development and Design Standards specifically addresses greenways, trails, and sidewalks as well as park and open space lands with regards to development within the City.

Section 10.2 talks specifically to street connectivity ratio requirements (links/nodes=ratio) and allows for one greenway/pedestrian connection per subdivision to be used to substitute one link in the street network to achieve the required connectivity ratio.

Section 10.5 addresses open space standards, indicating that certain developments may be exempt from park and open space requirements if said development includes a proposed connection to a nearby park or school by a sidewalk or greenway trail. Trails, greenways, and sidewalks that meet the intent of the open space standards must provide a reserved, minimum dimension of 15-feet in width.

The Development Ordinance also maintains that the administrator may require that, if the proposed development is adjacent to the boundary of an established community public open space, park, recreation, greenway, or open space adopted by the City Council, the proposed development shall provide connection from their open space network and/or trails system to the adjacent open space.

The ordinance also provides a fee in-lieu option if required open space cannot be reserved. This fee would be paid to a special parks and recreation services area fund, to accrue interest, and expended solely for property acquisition, development, or rehabilitation of recreational lands or related improvements. These fees are then appropriated by the City for a specific project that would serve residents of the development where the fee-in-lieu option was administered.

It is also imperative to recognize that the Concord Development Ordinance references and encourages compliance to the Complete Street Initiative. Section 10.6 of the CDO outlines the Complete Streets Initiative and helps guide Staff and private developers through designing and implementing safe streets that are convenient for users. By encouraging this initiative, the needs of drivers, public transportation vehicles and patrons, pedestrians and bicyclists of all ages and abilities are provided for in planning, programming, design, construction, and operations and maintenance.

By supporting the Complete Streets Initiative as outlined in section 10.6 of the CDO, the City of Concord strongly encourages all streets to:

- Accommodate people of all ages and abilities whether they are walking, bicycling, using public transit, or driving
- Create safe and inviting places by integrating connectivity and traffic calming measures with pedestrian-oriented site and building design
- Strengthen and enhance neighborhoods without displacing current residents
- Promote active and healthy lifestyles
- Integrate environmental stewardship, water management, and energy conservation
- Vary in character by neighborhood, density, and function

The Complete Streets Initiative applies to all roadway projects within the City of Concord, including those involving operations, maintenance, new construction, reconstruction, retrofits, rehabilitation, or changes in the allocation of pavement space on an existing roadway. For state-controlled roads, the City shall work with the North Carolina Department of Transportation (NCDOT) to apply this policy where applicable and appropriate. Complete streets may be achieved through single projects or incrementally over time through a series of smaller improvements.

The implementation of Complete Streets in the City intends to:

- Encourage people to walk, bike, and use public transit
- Provide transportation options for people of all ages, physical abilities, and income levels
- Enhance the safety and security of streets
- Improve the health of people
- Create walkable neighborhoods
- Reduce paved area, street water runoff into watersheds, greenhouse emissions and other air pollution, and energy consumption
- Promote the economic well-being of businesses and residents
- Increase civic space and encourage human interaction
- Create places with engaging architecture, street furniture, landscaping, and public art that reflect the diversity and cultures of the neighborhood
- Foster healthy commerce

Design elements that support the Initiative should be considered for all new or modified streets. Since not all projects are the same, design flexibility exists to accommodate unique circumstances and varied context of street projects. At a minimum, the following design elements should be considered:

- Keep street pavement widths to the minimum necessary
- Provide well-designed pedestrian accommodations in the form of sidewalks or shared-use paths
- Provide frequent, convenient and safe street crossings. These may be at intersections or at midblock locations where needed and appropriate
- Provide bicycle accommodations along streets
- Provide landscaped buffers between pedestrian and vehicular traffic where physical conditions permit
- Provide traffic-calming elements in accordance with the City of Concord's Traffic Calming Policy
- Integrate accommodations for public transit, such as bus pull-outs and transit stops into the sidewalk system

Outside of the Development Ordinance regarding new roadway construction, the City made a past decision to integrate wide outside lanes as a general policy when engineering a new roadway. It is recommended that this general policy be evaluated and modified such that pedestrian and bicycle facilities are factored into the design.



OPPORTUNITIES + CHALLENGES

With varying densities of development, de-centralized growth centers, and a system of automobile-oriented roadways, Concord is looking to provide its residents and visitors with opportunities to connect to desired destinations either by foot or bike. Typically, provisions for trails and multi-modal transportation offerings tend to get more traction in densely populated areas that exhibit shorter travel distances to services and civic destinations. As a result, areas connected by high speed vehicular corridors with long distances to destinations often do not get integrated into multi-modal transportation networks. There is an increased need to make multi-modal travel safe and more attractive to these less densely populated and developed centers.

With Concord being traversed by North Carolina state highways that prioritize through truck traffic over local access, opportunities for other types of infrastructure like biking, walking, on-street parking, wayfinding and streetscape enhancements are currently limited. However, the predominance of state roads throughout Concord creates an opportunity to partner with NCDOT on future roadway improvements to integrate these alternative transportation options into a network that supports a more balanced and connected transportation system.

The following are challenges and opportunities that should be identified as Concord moves forward in advancing their multi-modal transportation network.

- Maintaining the high quality of the existing greenway system, cultural assets, and natural resources.
- Managing transportation infrastructure demands within new and existing neighborhoods.
- Connecting public facilities (parks, greenways, civic centers, etc.) to their surrounding communities by creating linkages that reach into those communities.
- Being flexible in planning for future growth by revisiting priorities as new development trends emerge and demographics evolve.

This analysis plan helps guide the City of Concord to meet their population's growing desire to participate and thrive in an increasingly connected community. Through the planning process, identifying needs, challenges, and opportunities provides the City with valuable information so that they can strategically prioritize and implement sections of the overall connectivity plan.

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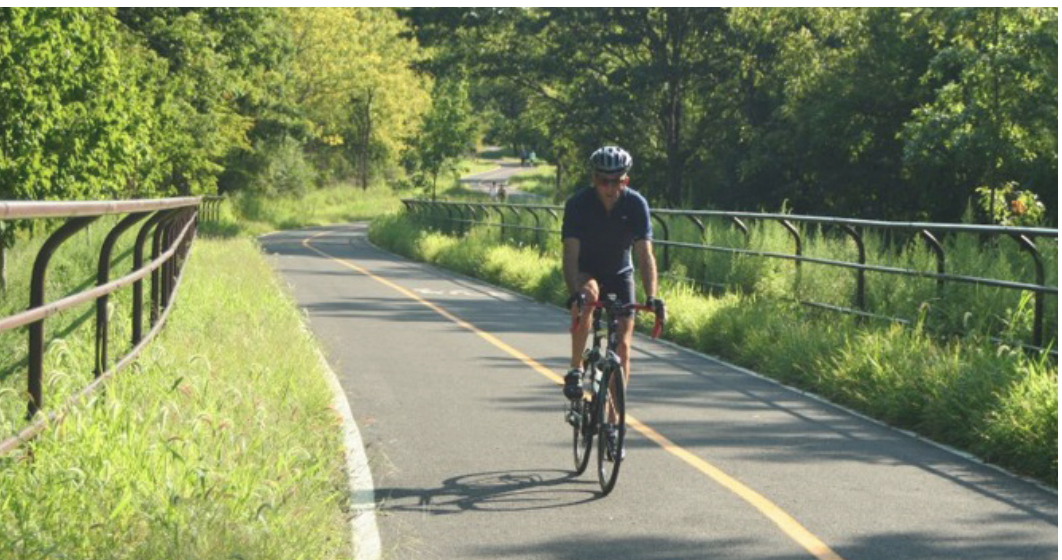
4 community engagement





CHAPTER 4 > COMMUNITY ENGAGEMENT

PUBLIC PROCESS OVERVIEW

The public process began with interviewing City of Concord Leadership and Staff. These groups are crucial stakeholders in the development of this connectivity analysis, as they will be tasked with making the vision of a more walkable, and interconnected community a reality.

STAFF MEETINGS - SUMMARY

The open space connectivity analysis discussion began with Parks and Recreation Staff. During this kick-off meeting the team:

- Reviewed the project process Goals and Objectives
- Identified critical issues
- Reviewed the project process and schedule
- Reviewed and finalized the public participation approach
- Clearly defined the Communication Process

Project process goals included:

- Completion of a detailed study of the Greenway Master Plan as included in the 2016 Comprehensive Parks and Recreation Master Plan to determine the feasibility of executing the plan over time.
- Establishment of a public input process that affords the greatest amount of input at critical stages in the planning process.
- Enabling the City to achieve their vision of a connected greenway network by identifying feasible, constructible routes, and providing supporting information to provide for well-informed decision making.

Project process objectives included:

- Evaluation of existing conditions along stream corridors and over-land connectors as identified in the Greenway Master Plan.
- Identifying opportunities and constraints.
- Utilizing existing planning efforts and precedent studies.
- Recommending possible trail alignments and access points.
- Identifying opportunities for new open spaces along the trail alignments.
- Identifying connectivity opportunities.
- Seeking opportunities to create small area trail loops similar to the Four Mile Downtown Greenway Loop.
- Identifying potential acquisition opportunities.

Critical issues identified in association with the creation of an open space connectivity analysis included:

- Existing and potential connections and trailheads
- Potential improvements to adjacent infrastructure
- Significant land uses and points of interest
- Environmental conditions
- Cultural, Historic & Archeological Resources
- Land division and ownership conditions
- Alignment Challenges / Opportunities such as:
  - Stream crossings
  - Challenging grades
  - At-grade road crossings
  - Crossing beneath bridges
  - Observed wetlands
  - Natural areas to be avoided/included
  - Relationship to adjacent property uses
  - Opportunities for coordination with stream restoration projects

Following the meeting with Parks and Recreation Staff, other City departments were engaged in the process to ascertain each department's relationship and responsibility regarding bicycle and pedestrian facilities. Departments that were interviewed included:

- Transportation
- Planning
- Engineering
- Building and Grounds
- Water Resources

Topics of discussion were developed for each department. Those topics and subsequent summaries are outlined below.

Transportation

Pedestrian Improvement Program

- 60 requests for sidewalks across the City - citizen driven requests
- A request will not come off the list until it is built
- Currently $150K budgeted per year for pedestrian improvements - these funds are usually combined over several years to complete improvement requests
- Also use Community Development Block Grant Program (CDBG) or Congestion Mitigation and Air Quality Improvement Program (CMAQ) Program funds
- Sidewalk gaps typically get taken care of through maintenance efforts

Road Resurfacing

- North Carolina Department of Transportation (NCDOT) Division resurfacing list is always changing. To date City has not worked with NCDOT to get bike/pedestrian striping incorporated into resurfacing projects
- City resurfacing
  - Projects are typically in subdivisions and downtown local streets where the streets are already narrow – have not incorporated bike/pedestrian striping into these projects
  - On larger streets, typically only providing patch work - not enough money to repave an entire street and incorporate bike/pedestrian striping

Cabarrus/Rowan Metropolitan Planning Organization (MPO)

- Road widening / improvement projects typically use a wide outside lane cross section
- The City (Transportation and Parks and Recreation) needs to be at the table to encourage the consideration of an alternate cross section that accommodate bicycle and pedestrian travel

Current or Planned State Transportation Improvement Program (STIP) Projects

- Currently no Bicycle/pedestrian projects included
- Most projects are funded through CMAQ
  - Local 20% match (80% federal)

Status of Bike Share

- Joint project with the Planning Department
- Did not get a strong response from the community that a bike share program was desired
- Council approved a pilot program in downtown and are interviewing vendors - vendors think they could get their own sponsorship
- Anticipating using fixed stations

Other relevant topics

- Currently no data collection for biking or walking user counts

Planning

Concord Development Ordinance (CDO) and Bike/Pedestrian Facilities

- Developers lean toward conditional rezonings as they want to preserve flexibility
- City may require bike racks and connectivity for pedestrians within the community
- Pedestrian connectivity to amenity areas within a new development is required
- If a development is "by right," there is not much the City can do other than require sidewalks
- Need Language in the ordinance that requires developers to dedicate trail easement, pay a fee-in-lieu, or build pedestrian linkages to aid in the construction of greenways

Opinion of developer built/funded trails

- Likes the idea of developer built/ funded trails
- However, typically if developers build a trail, they want it exclusively for community use, not public use

Other relevant topics

- The updated 2030 Land Use Plan included additional greenways

Engineering

Design oversight process (regarding greenways)

- Parks and Recreation Department comes to Engineering with project
- Decides if Engineering will produce the design in-house or contract it out
- Engineering stays involved in consultant designed projects
- Engineering provides proposal assistance as well

Project Delivery process

- Engineering helps analyze what projects are best suited for City capital improvement funded project vs. state or federal funding. Federal or State Transportation projects are better used for larger projects ($1,000,000 plus)
- Prefer to use City funds as the management of those projects due to it being easier to navigate
- Easement acquisition is always the challenge, not the design
- Surveying can be an obstacle due to lack of consultant capacity (time constraints)

Construction Administration process

- Decide whether construction administration can be done in house – State and Federally funded projects will require third party review and oversight

Building and Grounds

Maintenance

- Greenway maintenance is tailored - If a greenway is part of a park, greenway maintenance is combined with park maintenance
- Graffiti on pavement is the main problem
  - Try to get it off as soon as possible
  - Usually youth related
  - Use graffiti resistant paints in problem areas
  - Use pressure washer on sidewalks
  - Paint over graffiti on asphalt surfaces – use asphalt sealer
  - Use abrasives on stone/brick
  - City is proactive about invasive removal (kudzu, privet, cat briar, mimosa)
- All maintenance is done in-house

Budget

- Budget is reviewed annually - takes into consideration when things will come online in order to have proper equipment and manpower

Equipment

- Transportation has the large mowers.
- Building and Grounds typically have smaller mowers

Water Resources

Planned or Potential Stream Restoration Projects

- Currently no funding for stream restoration projects
- Currently restoring Stricker Branch
  - Asked to get greenway easement at the same time, this was declined
  - Co-location of easements tend to be challenging
- There are opportunities for water quality education - always trying to provide educational value in stream restoration projects
- One goal of stream restoration projects is to avoid concentrated flow
- Private mitigation bank activity is low right now
- Stormwater master plan identified some stream / water quality projects
- Water quality projects (such as stream restoration projects and rain gardens) were identified as a lesser priority than infrastructure projects, such as culvert upsizing
- Sewer master plan study
  - City does not pay for sewer extensions – Developer responsibility
  - Some projects have been identified at a few sub-basin locations
  - Have developed cost estimates to extend sanitary to large undeveloped lots, but currently is merely a line on a map
  - Water Resources do not see a downside with pursuing trail and sewer easements at the same time

Other relevant topics

- Consider incorporating good wayfinding and safety signs throughout the greenway system (e.g. tight turning radius, slippery when wet)
- Paved surface vs. natural surface:
  - Often there isn't a substantial cost difference between a paved and natural surface trail (when taking into consideration maintenance)
  - However, Council does have a desire for some natural surface trails
  - The City has built natural trails and is evaluating their performance
  - Developers are more inclined to build natural surface trails if required to build trail

CITY LEADERSHIP MEETINGS - SUMMARY

The team also met with City leadership at the onset of the project. Interacting with the Mayor, City Council and other elected officials was an important moment in the process. They have the best interests of Concord residents in mind and their insight is a valuable contribution to the plan.

Leadership reinforced the vision of being able to get anywhere within the city via foot or bicycle. Connectivity is key and leadership spoke specifically about their desire to connect to neighborhoods, greenways, parks, and retail centers. They also spoke about opportunities Concord has to connect to other municipalities in the Charlotte region. Concord wants to be a walkable city, a progressive city, a city where people want to live.

While connectivity is a priority of Council, we must recognize that Council has multiple priorities. There is much support from City leadership, and they encouraged the team to be bold and impactful in their recommendations.

CITY COUNCIL SMALL GROUP MEETING #1

Attendees:

- Mayor William C. "Bill" Dusch
- Lloyd Payne – City Manager
- Brian Hiatt – Previous City Manager
- Merl Hamilton – Previous Deputy City Manager
- Concord City Council
- Samuel Leder – District 1
- Ella Mae Small – District 3
- JC McKenzie – District 4

Parks and Recreation

- Bob Dowless - Director
- Mark Kincaid – Deputy Director

Meeting Comments:

- Loves greenways
- Health benefits
- Make the system as connected as possible
- Connect to business Centers
- Unfortunate that residents must drive to Dorton Park to go walking
- Afton neighborhood – unfortunate that residents must drive to Harris Teeter at Afton Ridge
- Can't imagine riding a bike in some neighborhoods (e.g. Ashley Green)
- Touch neighborhoods as trails go through the community (e.g. McEachern – goes from North part of town all the way to the South)
- District 3 is isolated
  - There are no bike lanes
  - Dire need of sidewalks in the area
  - Connect to the walking trail at Caldwell Park
  - Expand connections where possible
- Paved and unpaved trails –
  - Where terrain allows
  - Budget conscience
  - Set up trails for future paving
  - unpaved trails are softer on the knees
- Incorporate dog parks adjacent to greenway
- Bike lanes not the primary vision
- Land acquisition is biggest issue
  - Legal challenges and property rights
  - Likes the sound of mechanized (automated) land acquisition language in the CDO
- Have Kannapolis in the conversation when expanding the system – build connections
- Work with the County too
- Work Carolina Thread Trail into the equation

CITY COUNCIL SMALL GROUP MEETING #2

Attendees:

- Mayor William C. "Bill" Dusch
- Lloyd Payne – City Manager
- Brian Hiatt – Previous City Manager
- Merl Hamilton – Previous Deputy City Manager
- Concord City Council
- W. Brian King – District 2
- Terry Crawford – District 5
- Jennifer Parsley – District 6

Parks and Recreation

- Bob Dowless – Director
- Mark Kincaid – Deputy Director



Meeting Comments:

- People love the greenways
- Health benefits
- Big proponent of connectivity
- The vision is to protect the assets
- Must protect spaces now to expand the system later
- Connect Christenbury to Cox Mill
- Connect Laurel Park to Cannon School
- Connect Center City to Parks
- Families take kids to parks/facilities
- Alternate forms of transportation are important
- Would love the opportunity to avoid traffic
- Reduce congestion for locals
- Get customers safely to destinations – by foot or bike
- Trail oriented development is an economic driver
- Adds to tourism – give visitors more activities
- People sometimes do not fully understand how connectivity fits into the quality of life
- Some of the public constituency do not see the value
- Tax dollars and public safety must be considered
- Bonds might be a challenge – it was argued that if bonds were implemented, the public would rather see funds go toward education
- Celebrate the Piedmont Region
- Concord has woods/nature – embrace the natural environment

PUBLIC INPUT WORKSHOP SUMMARY

The City of Concord's Open Space Connectivity Analysis process included two public input workshops to solicit feedback on the needs and wants of the community. The workshops were held at the beginning of the planning process as a series of drop in open houses with the intention of reaching a wider geographic range of City residents. The project team held workshops at Fire Station #9, 1020 Ivey Cline Road and City Hall, 35 Cabarrus Avenue, West. Each workshop ran from 4:00 to 7:00 p.m. and 18 total attendees participated, some of which were City staff. Both workshops were structured identically to provide a consistent feedback mechanism.

ADVERTISING SUMMARY

We know it is crucial to the process to notify as many citizens as possible of the opportunity to provide their valuable input. As such, City staff and the project team employed various methods to advertise for the workshops. Those efforts are detailed below.

ADVERTISING AT THE BUNNY RUN

"Postcard" Flyers advertising the time and place of the workshops were included in each Bunny Run participant/ registration bag (approx. 182 pre-registration bags).

The Consultant team and Parks and Recreation Staff set up a table at the Bunny Run Festival to talk to the public about the project and the upcoming workshops.



"Postcard" Flyer Front (above) Flyer Back (below)





Project Team Participation at the Bunny Run Festival



PROVIDED HARDCOPIES OF THE "POSTCARD" FLYERS AT PUBLIC SPACES

"Postcard" Flyers that advertised the time and place of the workshops were available at:

- Academy Recreation Center
- Hartsell Recreation Center
- Logan Multi-Purpose Center
- Cabarrus County Senior Center
- City Hall
- Concord Housing and Technology Center

YARD SIGNS INSTALLED AT VARIOUS PARKS AND GREENWAYS

Three different yard sign designs were installed at the following locations to advertise the time and place of the workshops.

- Academy Recreation Center
- Dorton Park
- Moss Creek (2 locations)
- George Liles Greenway
- Hartsell Recreation Center
- Logan Multi-Purpose Center
- McEachern Greenway
- McGee Park
- Weddington Road Bark Park at Hector Henry Greenway
- Hector Henry Greenway entrance at Embassy Suites
- Patton Ct. – Downtown Loop Greenway







DIGITAL NOTICES

Various modes of digital media were used to advertise for the workshops. Screenshots of each digital notice is included as Appendix B. The methods utilized included:

- Parks and Recreation Website - (www.concordparksandrec.org)
- City of Concord Website - (www.concordnc.gov)
- CityLink Newsletter (https://www.concordnc.gov/Government/CityLink-Newsletter)
- Parks and Recreation Facebook Page (https://www.facebook.com/concordncparksandrec/)
- Next Door
- Email Blasts
  - Through ActiveNet
  - Through local HOA president contacts
  - Through NC Active Routes to Schools, Region 4 Coordinator – George Berger

Workshop attendees were asked to identify all the ways in which they heard about the workshop. Those results are detailed below. What we found was that Next Door was the most common way people heard about the meeting with word of mouth and the meeting flyer not far behind.

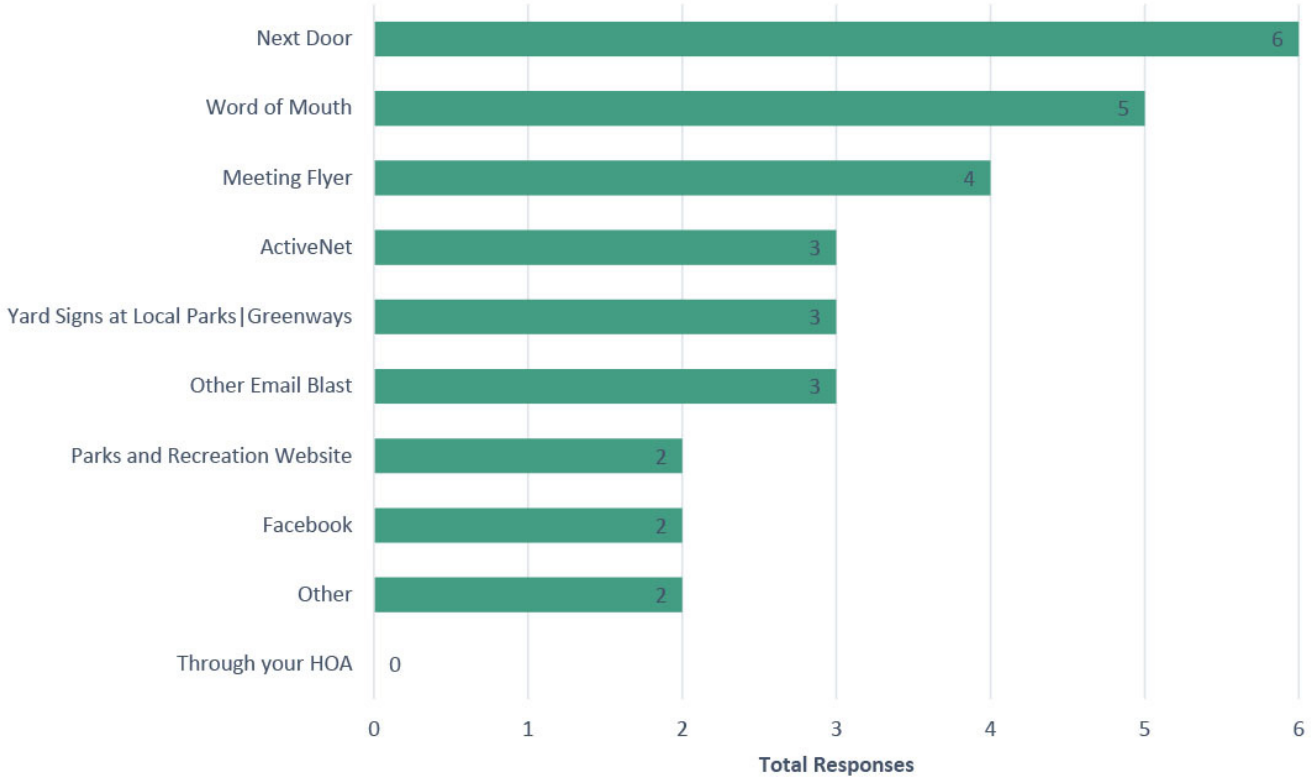


Figure 1 – How did you hear about the public workshop?

SUMMARY OF COMMMUNITY INPUT APPROACH

The 18 workshop attendees were given handouts that summarized the project process (Appendix C). They were then engaged to provide input by visiting each of five stations and using dots to respond to input questions and engage in mapping exercises. Attendees could then post final comments if their perspective had not been fully captured by the other elements of the input session. Attendees were instructed to use a dot to respond to as many items on a board as they chose, but to use only one dot per item. City and project staff were present to answer questions and facilitate guided discussion and participation in the mapping exercises.

While a quantitative method for counting attendee responses was used, this approach is not intended to provide scientific data. The results herein should be interpreted as anecdotal and used to better understand the perceived needs and wants of respondents. Included in the results is the data responses obtained from handouts that were filled out and sent back to the project team (5 total).

WHICH VALUES ARE MOST IMPORTANT TO YOU?

This board received a total of 78 dot responses. The values included on the board were written as follows, and are listed in the order of most responses to least responses:

1. Health + fitness: I believe that personal health and fitness are important.
2. Environment + nature: I believe that preserving and engaging with the environment is important.
3. People + community: I believe that relationships and a sense of community and belonging are important.
4. Education + learning: I believe that lifelong learning and teaching for people of all ages is important.
5. History + culture: I believe that our history and our culture are important.

Results indicate that health + fitness is a widely-held community value, with nearly all attendee's selecting that as a response. Environment + nature, and People + community are also values held widely in the community, with most respondents holding these values. Education + learning had fewer responses but was still widely supported with more than half of respondents selecting these values. History + culture received the fewest responses but is a community value that should still be considered valuable as 40% of respondents felt this value was important.

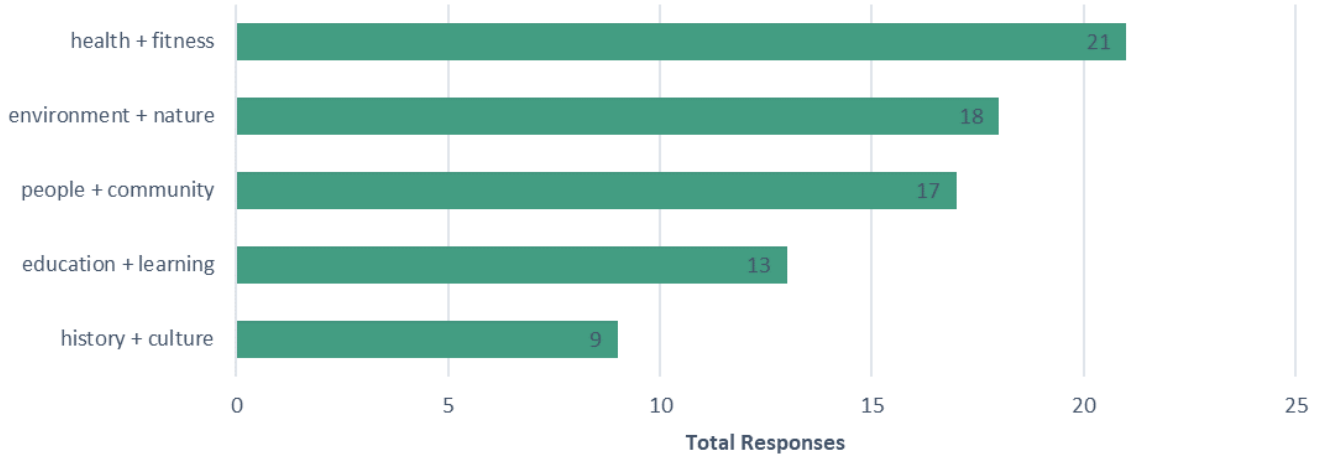


Figure 2 – Which values are most important to you?

HOW DO YOU OR WOULD YOU USE BICYCLE AND PEDESTRIAN CONNECTIONS?

The purpose of this board was to gather input on how Concord residents either do use or would like to use bicycle and pedestrian connections. Walking was the most popular response with almost 90% of respondents supporting this method of using connections. Biking and hiking were the second and third most highly ranked responses with 68% and 59% of respondents respectively indicating their preference for biking and hiking.

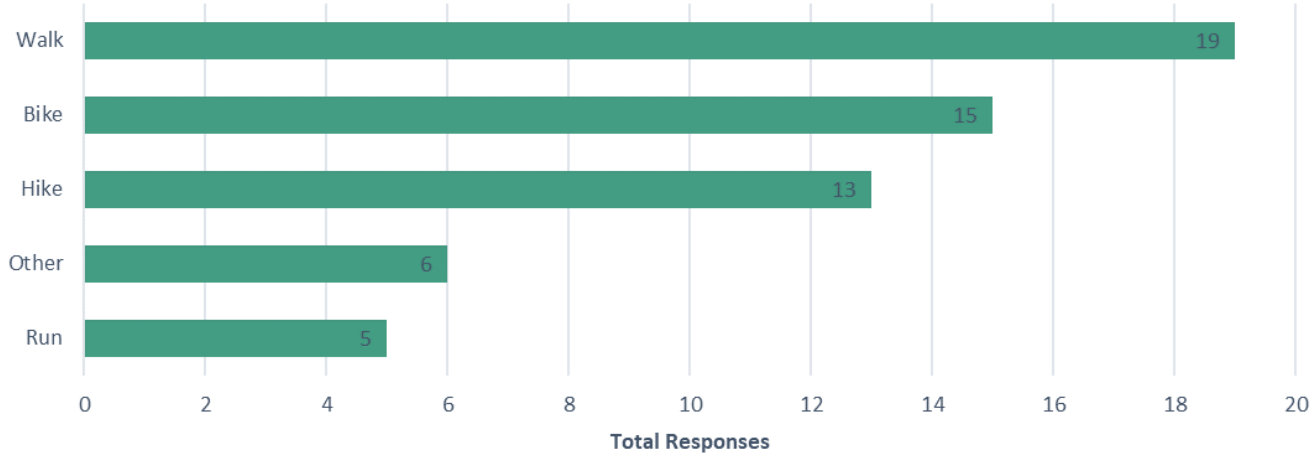


Figure 3 – How do you or would you use bicycle and pedestrian connections?

WHAT TYPE OF BICYCLE AND PEDESTRIAN CONNECTION FACILITY DO YOU OR WOULD YOU USE?

The purpose of this board was to gather input on what type of connections Concord residents either do use or would like to use. Greenways and Multi-Use paths were the most popular responses with 86% of respondents supporting this type of connection. Buffered Bike Lanes were desired by 50% of respondents, with bike lanes|sidewalks and protected bike lanes indicated as a desirable facility by 41% and 36% of respondents respectively.

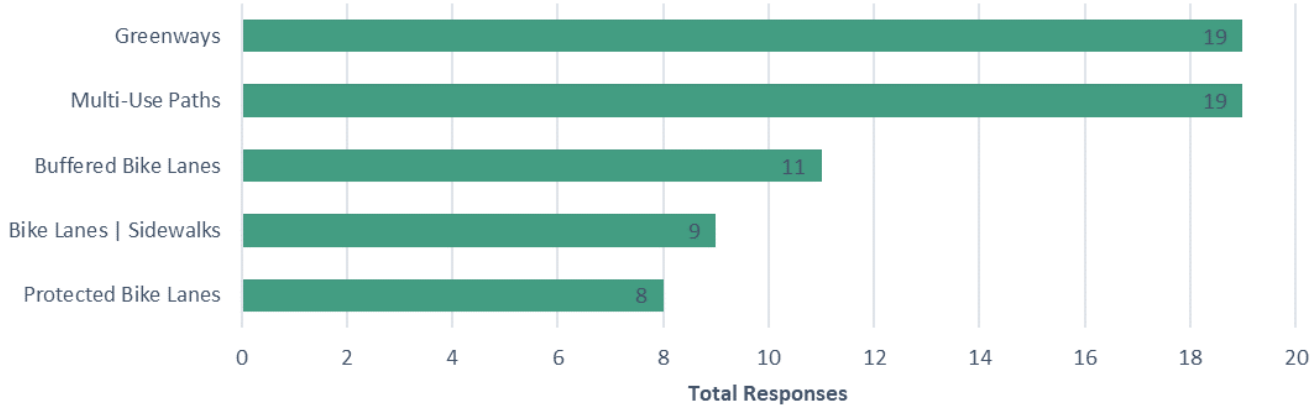


Figure 4 – What type of bicycle and pedestrian connection facility do you or would you use?

WHY DO YOU OR WOULD YOU USE BICYCLE AND PEDESTRIAN CONNECTIONS?

The purpose of this board is to gather input on why Concord residents use or would like to use bicycle and pedestrian connections. Understanding this perspective will inform recommendations regarding what facilities, design elements, routes or destinations are best suited for the community's needs and wants.

Reflecting on the provided responses, improving health and fitness is the highest priority for potential greenway trail users. Connecting with nature and taking short trips|running errands and relieving stress were the second and third priorities, highlighting the trend for desired urban living while maintaining access to natural features. Commuting to work, learning, and commuting to school were ranked as the lowest reason people would like to use greenways.

The desire to use greenways to connect with nature and to relieve stress indicates a need for trails in quiet and peaceful areas, while the preference for connections to occur where people can make short trips and/or accomplish small tasks indicates a need for corridors that connect people to destinations such as commercial downtown areas, parks, or entertainment destinations.

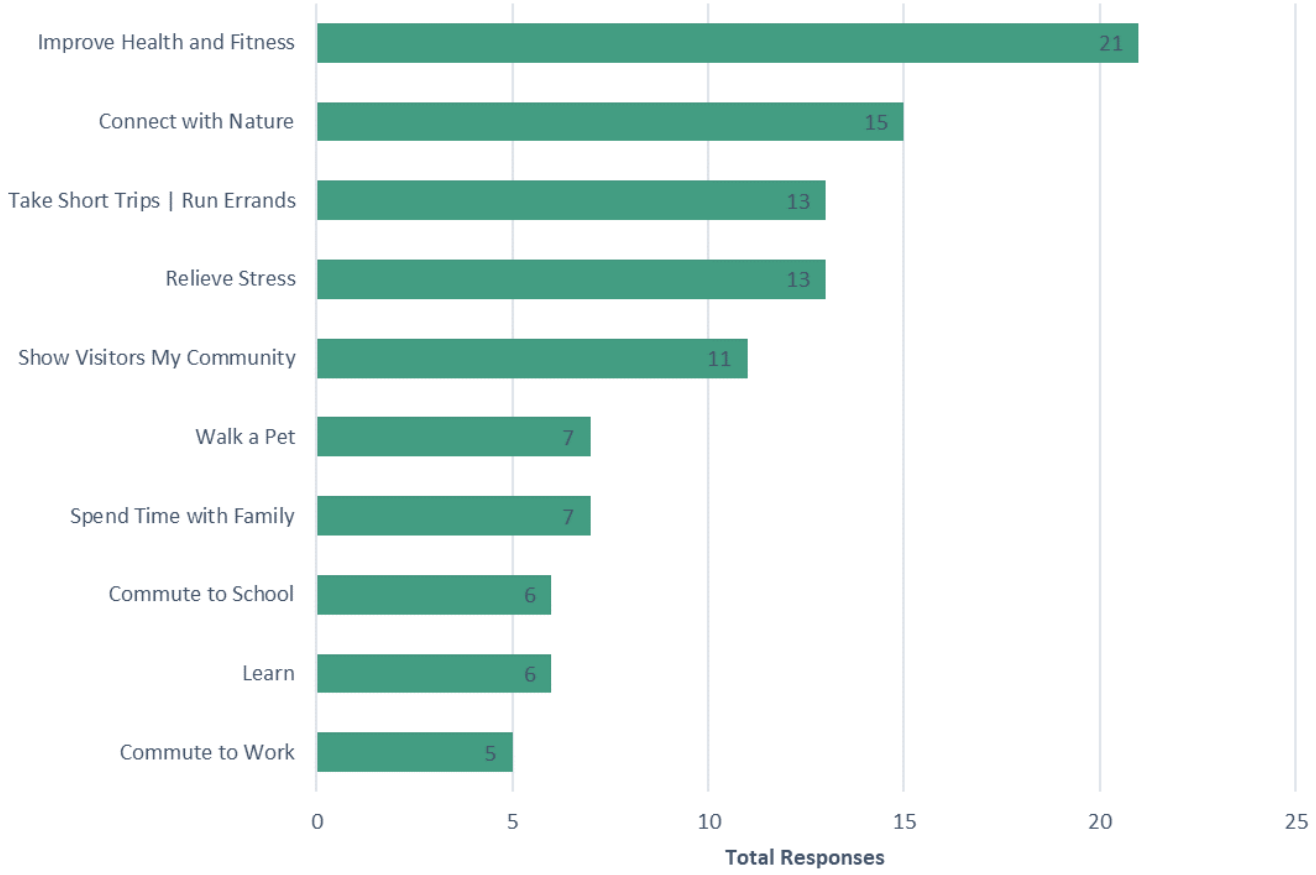


Figure 5 – Why do you or would you use bicycle and pedestrian connections?

MAPPING EXERCISE

The mapping exercise encouraged participants to indicate where they live, destinations they would like to visit via a bicycle or pedestrian connection, and routes they would like to take to get there. They then ranked the top three corridors they would like to see completed. A member of the project team facilitated this activity, answering questions, helping participants identify locations on the map, and encouraging input. The mapping exercise provides a geographic depiction of demand for connections and begins to map potential destinations, routes, and their popularity.

Workshop attendees primarily came from neighborhoods located downtown, in the NW and Western parts of the city, neighborhoods that are centrally located in the City, one in the SW sector and one just East of the city limits.

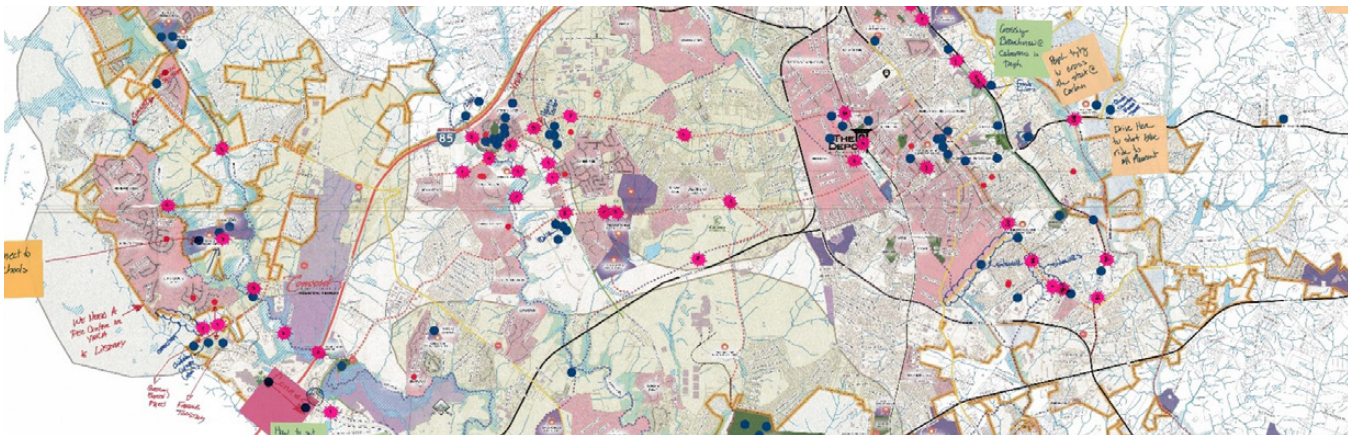
Destinations identified as desirable to walk/bike to included parks, schools, various retail centers, greenways and Downtown destinations.

Additional routes and connections to explore as identified by participants included:

- Connection to Cox Mill Schools
- Connection from Christenbury neighborhood to Christenbury Corners retail center
- Connection from the Speedway to the hotels
- further west (Bruton Smith barrier)
- Connection from those hotels over to Concord Mills (I-85 barrier)
- Provide sidewalks along Wilshire Ave. from Lincoln St. SW to Union St.
- Sidewalks on Union St. S.







Corridors that participants would most like to see completed are identified in the table below. The numbers following each identified corridor are indicative of how many times that corridor was identified with a particular ranking (1, 2, or 3).

PRIORITY	1	2	3
Proposed Branchview Dr. / Three Mile Creek Greenway	3	1	3
Study Area Poplar Tent Road	2	2	2
Proposed Coddle Creek Greenway	2	1	1
Study Area George Lyles Parkway	2		
Connection to Christenbury Corner	2		
Study Area Weddington Road	1	3	
Proposed Rocky River Greenway	1		3
Study Area Union Street S	1		3
Study Area Cabarrus Ave.	1		
Bruton Smith Blvd.	1		
NC Highway 73 E	1		
Study Area Branchview Drive SE		2	
Study Area McGill Avenue NW		1	
Connection to The Depot		1	
Connection to Cox Mill Elementary High School		1	
Davidson Highway		1	
Proposed Clarke Creek Greenway		1	
Proposed Irish Buffalo Creek Greenway		1	
Proposed Concord Parkway			1
Study Area Cold Water Creek Greenway			1

Table 1 – Public Input Corridor Rankings

ADDITIONAL COMMENTS

- NW Concord, near Concord Mills, is really lacking in connectivity. Please budget a lot more for connectivity via sidewalks, multi-purpose paths, greenways.
- Instead of concrete, asphalt paths would be good enough.
- Would love to be able to walk to restaurants and grocery stores (e.g. EarthFare, Lidl).
- Sidewalks on Poplar Tent
- Connection of McEachern Greenway to Burrage
- Connection to Hotels/Speedway to Concord Mills
- Greenways connecting Logan Community to Downtown and other greenways
- Wayfinding on trails need to be better – more map kiosks need to be out there.
- Sculptures on trails – local or area connected artisans or painted sides of buildings (murals)
- Interactive things on pavement – hopscotch, etc.
- Paths wide enough to allow bikers and walkers to co-exist
- Law enforcement on trails – build community
- Emergency light system and location markers for use in case of emergency to communicate with responders
- Distance markers – painted or markers that correspond to wayfinding/directional information – i.e. on maps – kept current on website
- Southwest quarter severely lacking city park/trails/community center/library
- Bistros, bike shop, etc. along trail system or accessible to
- Community education programs using trail system – bird watching, bike safety, trekking
- Trails should start in high pop. Density areas, e.g. historic district, and radiate outward to other areas like spokes on a wheel so that the trails go somewhere as opposed to disconnected sections of trail that are essentially isolated.
- Continue to seek incorporation of bike/ped/Complete Streets elements as part of NCDOT projects.

OTHER INPUT SOLICITATION METHODS

In addition to the public workshops, input was solicited through:

- A link to an online Wufoo survey hosted by Survey Monkey was made available through the Parks and Recreation website. A copy of the Survey is included in the summary as Appendix D.
- Input boards utilized at the workshops were provided in a hardcopy package (Appendix E) for individuals to fill out at their leisure. A copy of the online survey (Appendix C) was also provided as part of the hardcopy package. These packages were available at the following locations:
  - Academy Recreation Center
  - Hartsell Recreation Center
  - Logan Multi-Purpose Center
  - Cabarrus County Senior Center
  - Concord Housing and Technology Center
  - The intent was to provide an alternative way for individuals to provide feedback that either were not able to attend the workshops or for those without regular access to the internet.

There was also a half page ad included in the Summer 2018 Leisure Times that outlined ways for citizens to provide feedback.



Public Input Solicitation as included in Summer 2018 Leisure Times Publication

ANALYSIS OF PUBLIC INPUT AND SURVEY DATA

What we gleaned from the public input and survey data is that people love to walk and bike. They either make it part of their regular routine or have the desire to do so. It was discovered that not currently or regularly participating in these activities was due to obstacles and barriers such as:

- lack of facilities (sidewalks, bike lane, bike routes,) near their residence
- dangerous traffic conditions that make walking/biking any type of distance undesirable,
- lack of wheelchair and parking access to greenways
- no continuity in bike lanes
- general safety concerns trying to traverse a fractured network.

It was discovered that while the majority of participants and respondents felt safe walking or running in Concord, the same cannot be said for biking.

It was also identified that people are using the existing bicycle and pedestrian facilities together as a family, for health and fitness benefits, to enjoy nature and the outdoors, and uphold environmental consciousness by using the facilities as an alternate mode of transportation. They are doing so in their neighborhoods, along existing greenways, and Downtown; connecting to Parks and Recreation centers, schools, restaurants, grocery stores, retail shops and entertainment centers.

Improvements respondents wanted to see made to support walking and biking included:

- More sidewalks/trails/bike facilities to connect neighborhoods, schools, parks, commercial and business destinations, transit stations, and entertainment
- Actively promote cycling and walking within the community
- Greenway expansion and creation of continuous trail loops
- Natural surface hiking/walking trails to partake in a more organic experience
- Make greenway markers more noticeable
- A campaign to educate and promote safer cycling practices
- More dedicated and protected bike facilities
- Longer and/or connected dedicated bike facilities to accommodate longer rides
- Improvements to signage and symbols for existing bike lanes
- Better management and maintenance of the existing bike lanes
- Recreational mountain bike trails, pump track, or BMX skatepark
- Better signage for cycling safety and pedestrian guidance
- Maps that highlight available bike and pedestrian routes
- General maintenance of the system
- General safety of the system- More police/ security presence
- Addition of Lighting along the greenways
- "Pedestrian Walk/Don't Walk Signals" for downtown - Including audible tones and vibrotactile surfaces
- Amenities along the corridors (Drinking fountains, bike racks, bike share stations, splash pad, parks)

Clarification regarding the survey/workshop information symbology:



Neighborhoods that were called out by survey participants as desired destinations



Desired destinations as provided by the survey participants



Desired destinations as obtained from the public input meeting



Corridor priority notations as obtained from the public input meeting

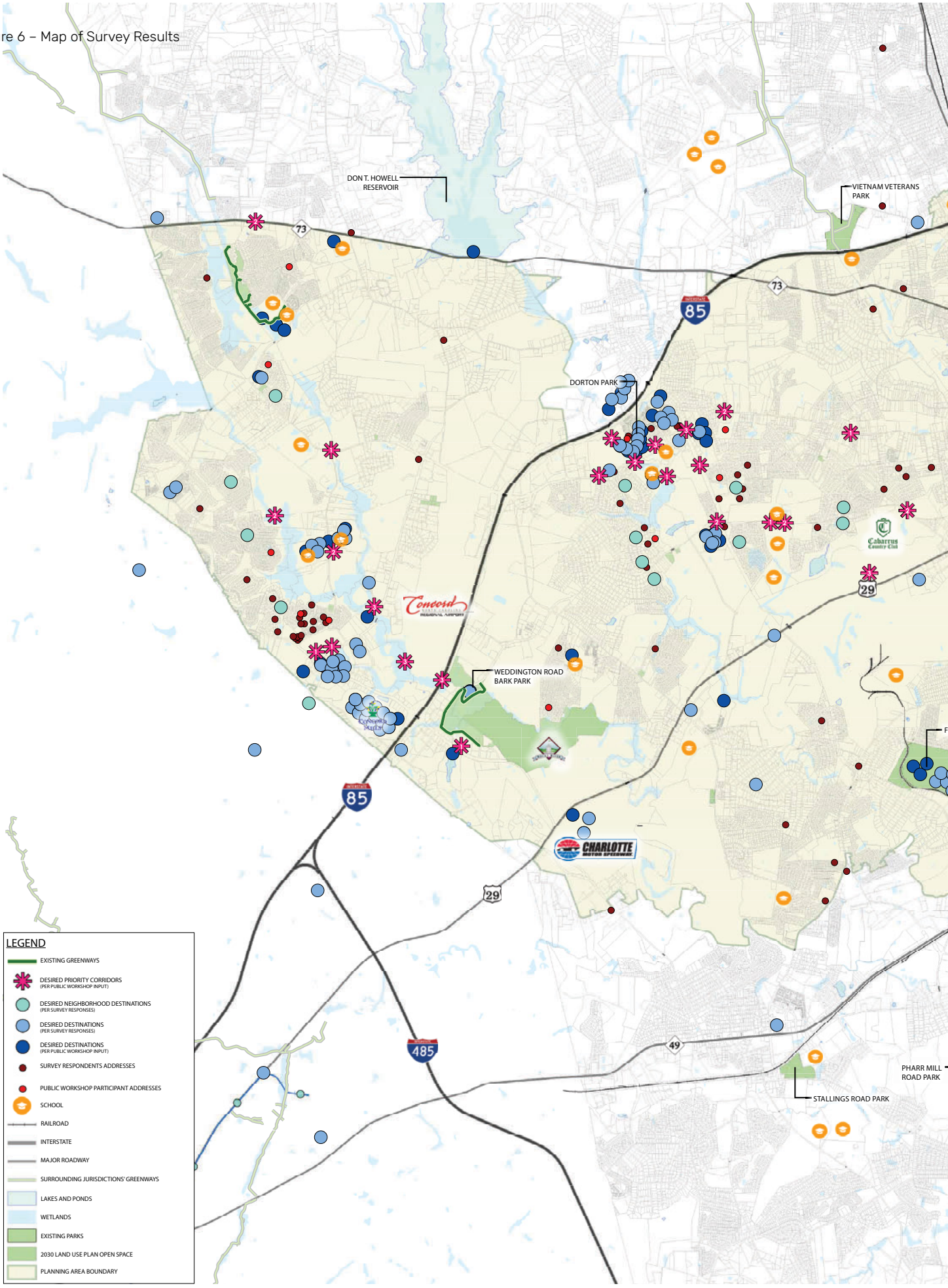


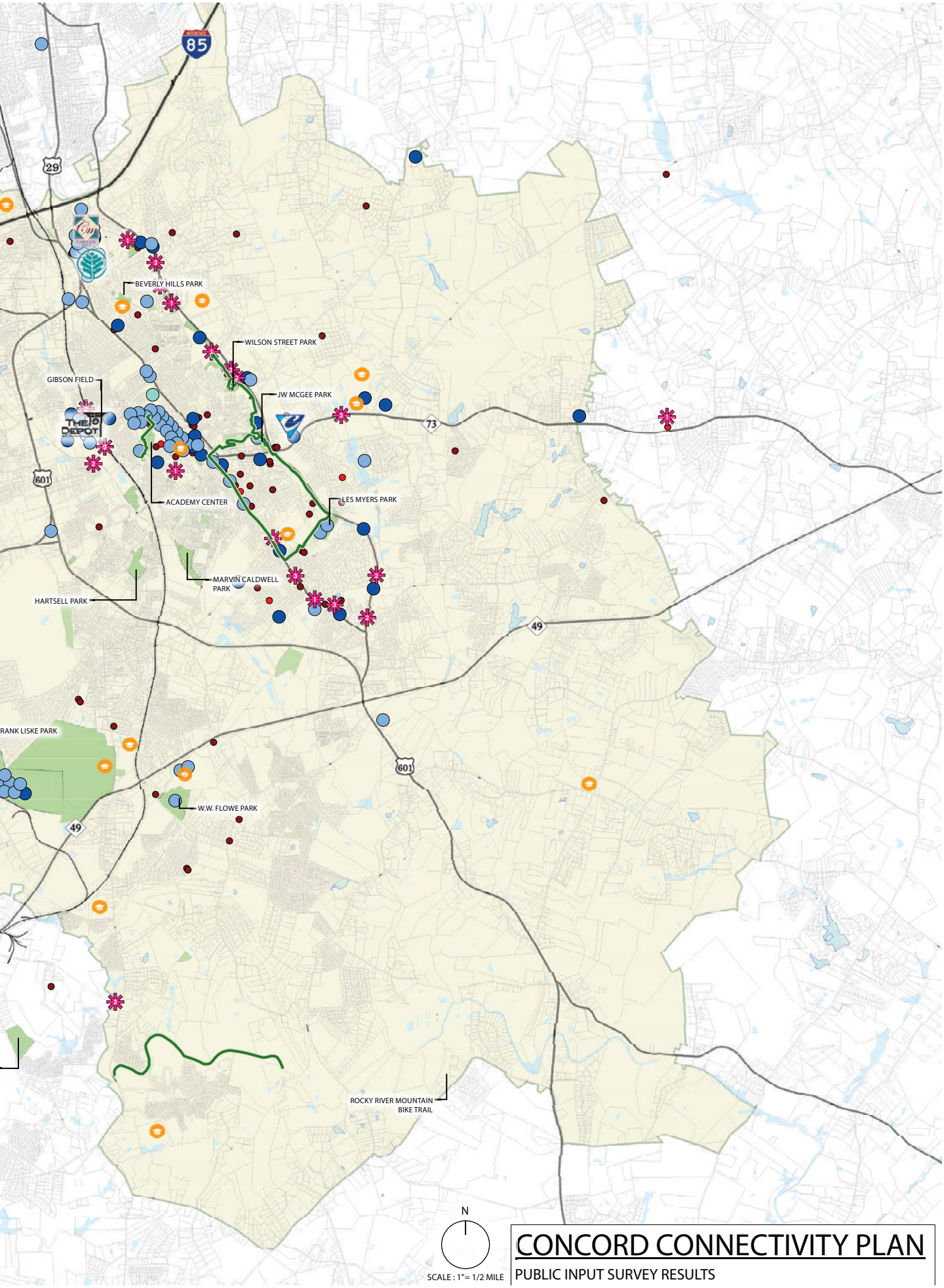
These are the home locations of the public input meeting participants



These are the address (or nearest intersection) as provided by the survey participants

Figure 6 – Map of Survey Results

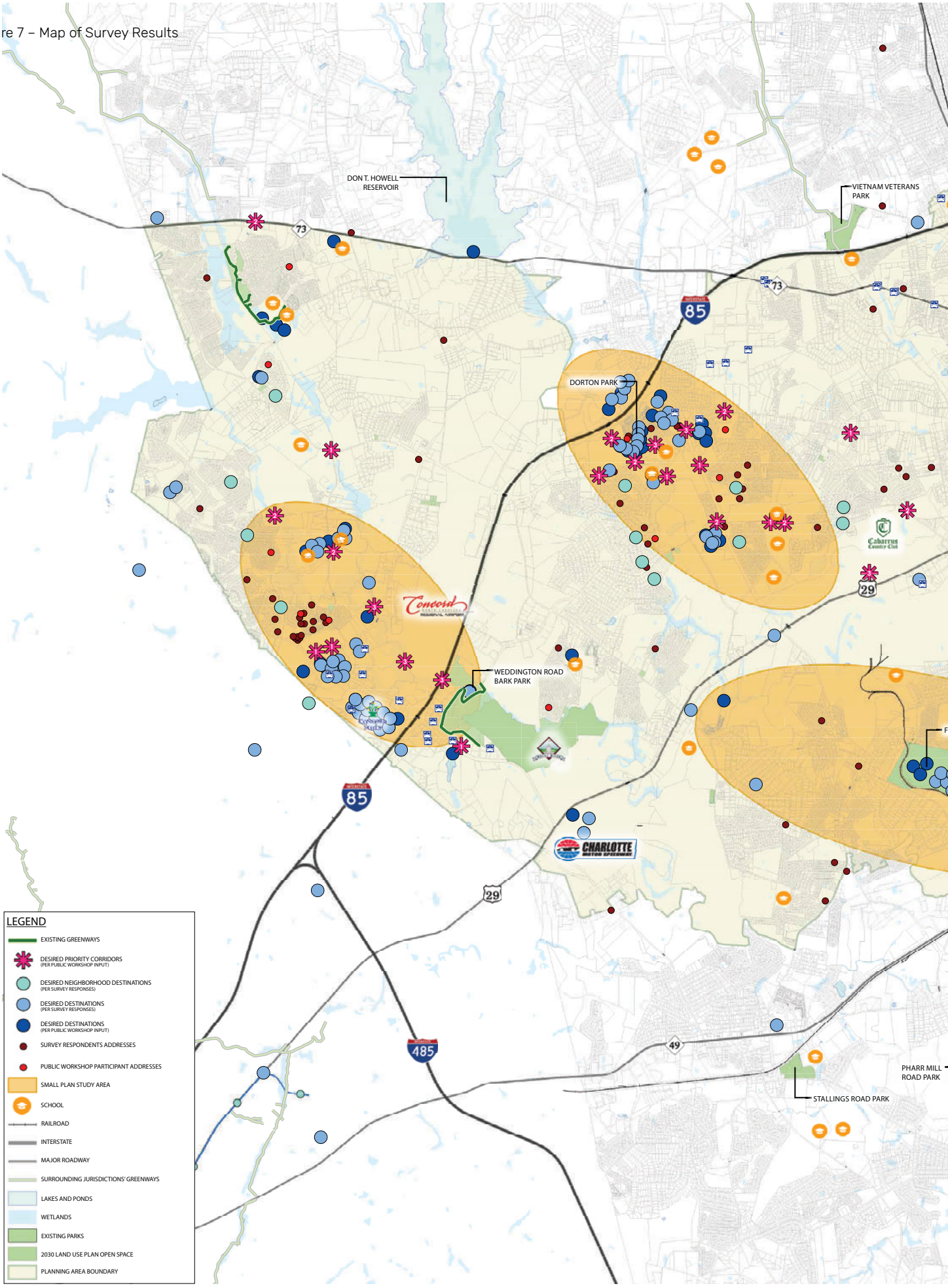


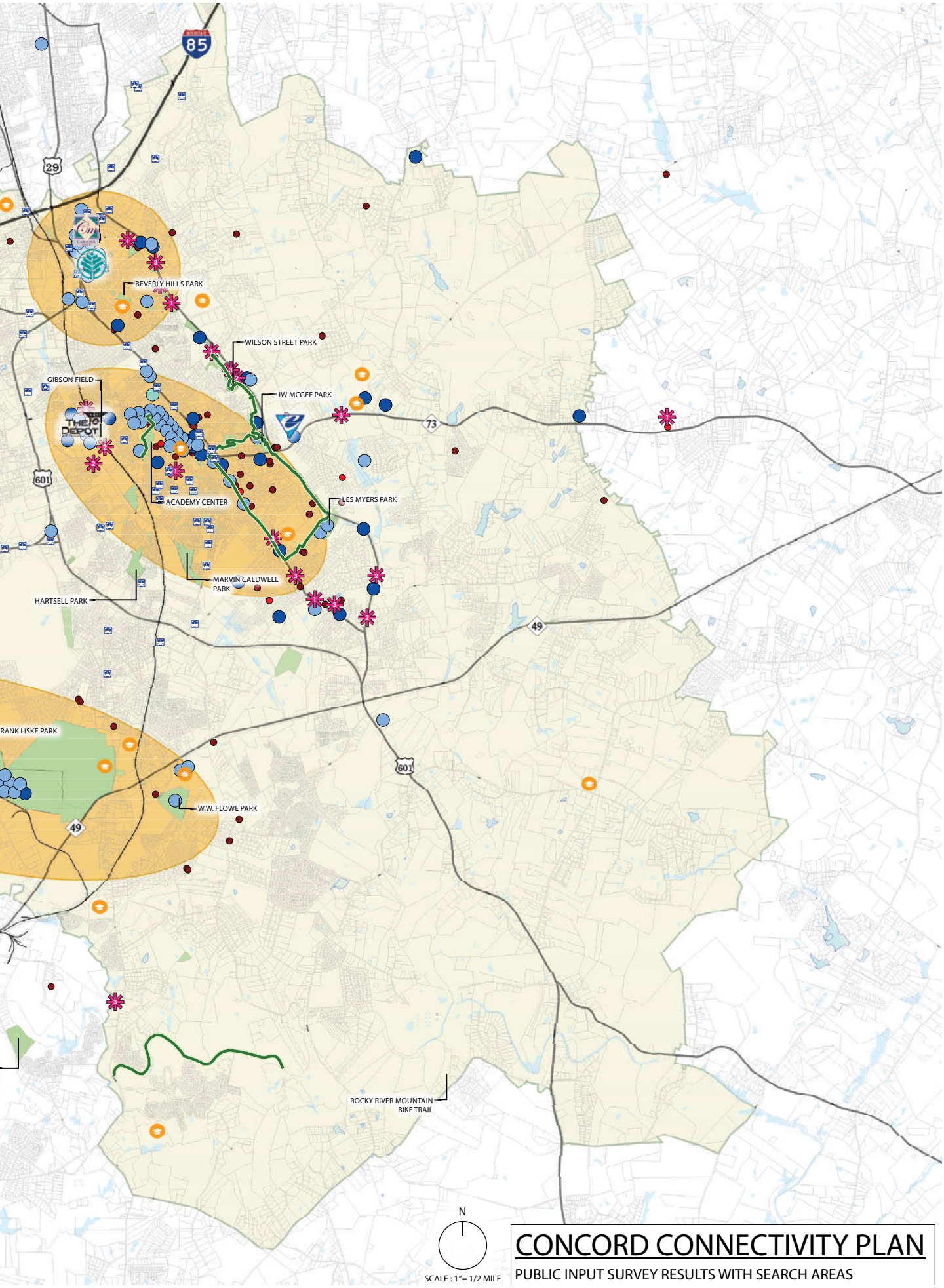


CONCORD CONNECTIVITY PLAN

PUBLIC INPUT SURVEY RESULTS

Figure 7 – Map of Survey Results





CONCORD CONNECTIVITY PLAN

PUBLIC INPUT SURVEY RESULTS WITH SEARCH AREAS

5 guiding principles





CHAPTER 5 > GUIDING PRINCIPLES

Guiding principles of a greenway system represent the broad philosophy that guides greenway planning and design. Consistent across the industry, the following guiding principals were considered when authoring the recommendations contained herein. Trails should be:

- Accessible
- Equitable
- Experiential
- Safe

ACCESSIBILITY

Accessibility generally refers to constructing greenways to minimum criteria to ensure they can be used and enjoyed by people of all ages and ability levels. Often regulated by the American's with Disabilities Act (ADA), such criteria tend to be technical in nature, controlling built aspects of greenways such as width, surface material, and longitudinal and horizontal slopes. More recently, the U.S. Access Board has published the Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG). This document expands ADA standards to include those more specifically within the public-right-of-way.

The definition and role of accessibility has also been broadened and coined "universal design" or "inclusive design." Inclusivity expands the idea of accessibility to include the experiences of users with disabilities including mobility difficulties, as well as cognitive, visual, auditory or other disabilities.

EQUITY

Equity refers to the state of being equal and in the context of greenway planning, can refer to social, environmental or health equity. In all cases, greenways should aim to support all residents equally, regardless of income, gender, race/ethnicity, location or education in order to improve social connection and community bonds, improve health and well-being and preserve healthy natural resources. Often, an investment in greenway infrastructure is located near population centers with higher densities where access to education, employment, public transportation and healthy food and lifestyles choices are more prevalent. Investment in greenway infrastructure should happen in a way that provides more vulnerable populations with equitable greenway infrastructure, access, and experiences. Particular attention to investment equity should be applied to balancing both urban and rural access to greenways and trails.

EXPERIENCE

Experience refers to feedback from the five senses when engaging in a task or activity. Together, the sensory feedback forms an experience, one that is positive or negative. Ultimately, using greenway trails should be a positive and healthy experience gained from access to the sights and sounds of nature, pleasant views, and perceived safety. Greenway trails should contribute to an overall quality of life and ideally become a regular part of everyday life for short trips, exercise and connecting with nature and loved-ones.

SAFETY

Safety refers to networks that provide routes that minimize the risk of injury, danger and crime. Safe greenway and trails networks are comfortable for users of all ages and ability levels as a safe means of alternative transportation making it easier to walk, hike, jog or ride a bike. The application of relevant design standards ensures that grades, curves, and intersections with roadways and driveways are as safe as a possible. Once in the design process, greenway and trails projects should be coordinated with NCDOT and local transportation staff to enhance the safety of each project. Greenways are as safe as the neighborhoods they traverse. Communities should develop appropriate policing and volunteer ambassador programs as their network expands.



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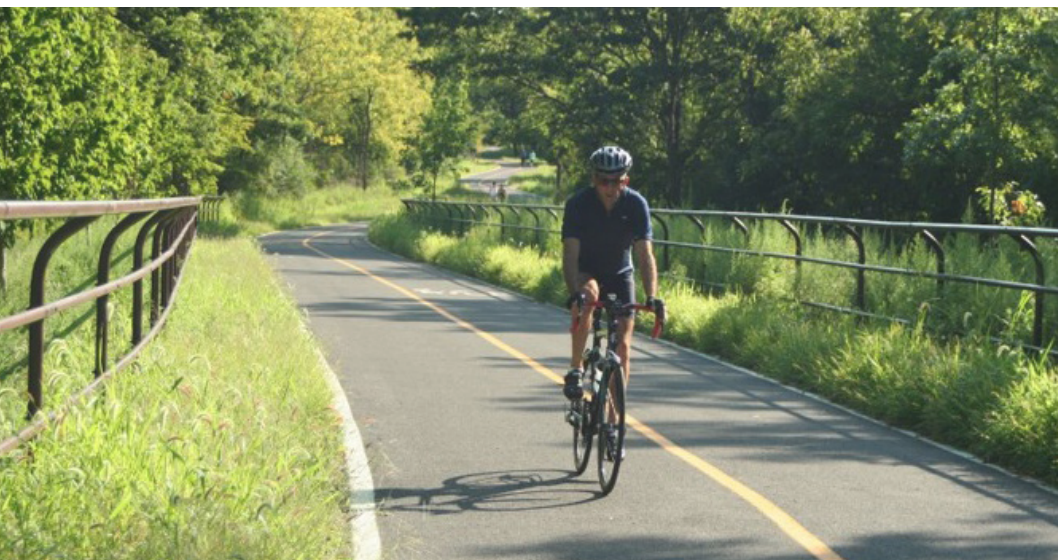
6 open space connectivity system considerations





CHAPTER 6 > OPEN SPACE CONNECTIVITY SYSTEM CONSIDERATIONS

Bicycle and pedestrian connection projects are complicated, and the information contained in this section provides guidelines and suggestions for consideration at the planning, design, and construction phases of a project. Since no two projects are the same, all information may not apply and therefore pertinent ideas should be extrapolated from the text as applicable. The considerations contained herein are intended to assist the City of Concord's staff and consultants. The content as outlined does not preclude requirements of any city, state, or federal ordinance, as these considerations are intended to provide a direction for the development process.

PLANNING CONSIDERATIONS

Planning a pedestrian trail or bicycle facility project must first start with asking the critical questions.

- Who is the community that is being served by the project?
- What is the full scope of the project?
- What is the end goal?
- How will the project be funded?
- Who needs to be at the table in the early planning phases?
- What amenities will it provide?
- Who will be responsible for long term needs and maintenance?

To help answer some of these critical questions, it is recommended to have corridor and feasibility studies prepared. These studies will assess the practicality of the proposed project and guide decisions that shape project scope and budget.

A **corridor study** looks at the area as a whole. The goal is to identify major trip generators and terminations in a cohesive way that also has a long timeline for completion, i.e. 10-20 years. The purpose of a corridor study is to identify specific projects within a corridor that have logical beginnings and ends and that can be built with available funding sources. The study may include probable costs based on linear foot. However, the probable costs should only be used as a high level estimate, as base map data used to produce the estimate is only high level GIS data. While cost estimates from the corridor study may be used when applying for grant funding, they are very preliminary.

Corridor Studies typically include:

- 10-20 Mile Corridors
- Opportunities and Constraints Analysis
- Route Concept Maps
- Public Input
- Property Acquisition Strategy

A **feasibility study** is the next step upon completion of a corridor study but before engineering and design. A feasibility study takes a more detailed look at a specific project identified from the corridor study. The feasibility study is a relatively low expense to the City but produces a much more accurate picture of probable costs, especially regarding construction materials and rights-of-way needs. It also established an accurate schedule for design, permitting, and construction.

A typical feasibility study lays out a rough design that considers widths of trail and grades based on available GIS contours. Physical constraints such as sewer manholes, above ground utilities, and flood plains and flood ways are looked at in detail to route trail alignments. If there are alternative alignments, each will be looked at and weighed against each other and a preferred alignment will be recommended based on the available data. Grading limits can be estimated at the feasibility level which is the basis for starting right-of-way negotiations with property owners while having a more accurate idea of what will be needed for both permanent and temporary easements. From this information preliminary cost estimates can be produced that may be used to submit for grant funding for right-of-way, design and engineering services, as well as construction.

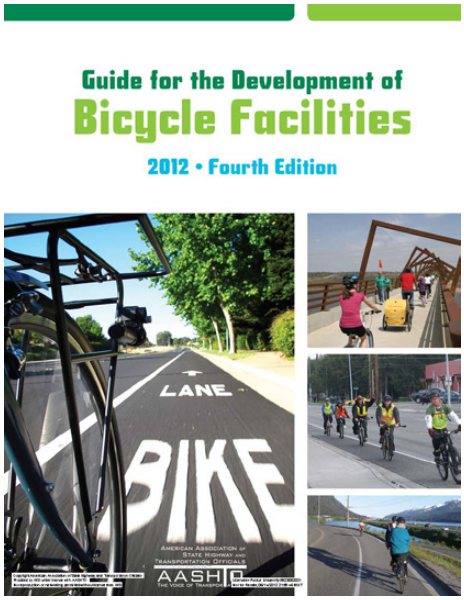
Feasibility Studies typically include:

- 1-5 Mile Corridors
- Definition of a Specific Project
- Detailed Route Analysis
- Public Input
- Cost Estimates
- Budgeting and Pursuit of Funding

DESIGN STANDARDS

AASHTO GUIDE FOR THE DEVELOPMENT OF BICYCLE FACILITIES, 4TH EDITION

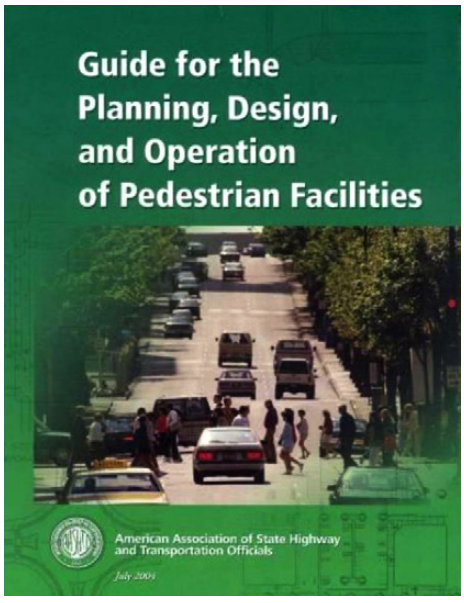
Published by the American Association of State Highway and Transportation Officials (AASHTO), this guide provides the basis for both planning and designing bicycle facilities. Information covered includes planning, bicycle operation and safety, on-road bicycle facility design, Shared-Use Path design, bicycle parking, and maintenance and operations. The purpose of the guide is to present sound planning and design guidelines by referencing a recommended range of design values and describing alternative design approaches. The guide also allows for the incorporation of pedestrians and motorists along with bicyclists for dynamic designs that are sensitive to local context.



(link: Guide for the Development of Bicycle Facilities, 4th Edition)

AASHTO GUIDE FOR THE PLANNING, DESIGN AND OPERATION OF PEDESTRIAN FACILITIES, 1ST EDITION

Much like the AASHTO's Guide for the Development of Bicycle Facilities, this guide provides instruction on planning, design and operation of pedestrian facilities along streets and highways, focusing on effective ways to accommodate pedestrians within public rights-of-way. Methods to accommodate pedestrian vary depending on the roadway and facility type, and those practices are described in this guide. It also addresses land use planning and site design, as these topics have a profound effect on pedestrian mobility.

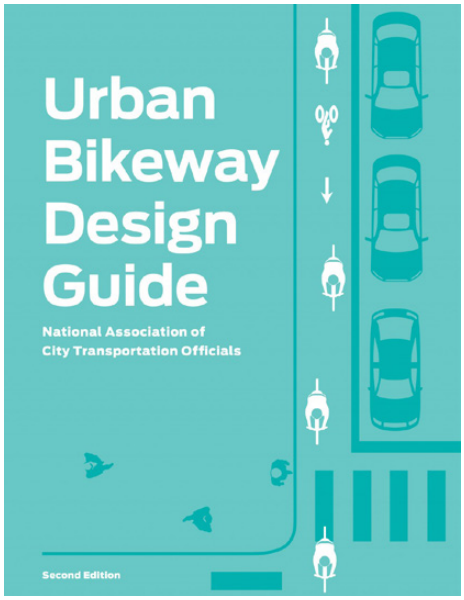


(link: Guide for the Planning, Design and Operation of Pedestrian Facilities, 1st Edition)

NACTO URBAN BIKEWAY DESIGN GUIDE

The NACTO Urban Bikeway Design Guide is based on experience and recommendations from prominent cycling cities from around the world. The target of this guide are cities seeking to improve bicycle transportation where unique challenges like high interaction with traffic, decreased right of way, and increased conflict points are present. These challenged demand innovative solutions and the NACTO guide showcases how other cities have conquered these challenges. The AASHTO Guide is not referenced in most of NACTO design solutions. However, virtually all treatments are permitted under the Manual on Uniform Traffic Control Devices (MUTCD).

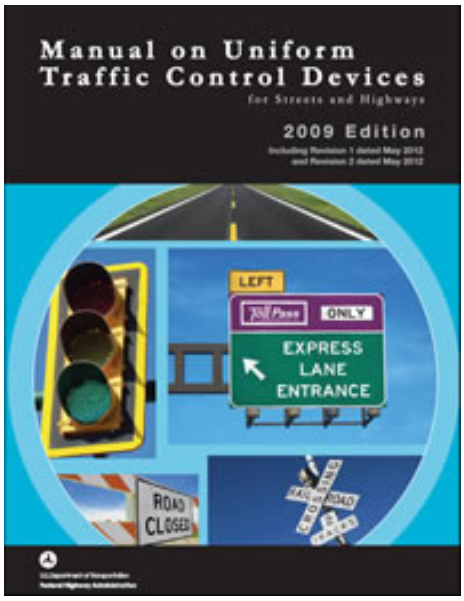
(link: NACTO Urban Bikeway Design Guide)



MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

The Federal Highway Administration's MUTCD is the foremost source for guidance on lane striping requirements, signal warrants, recommended signage, and recommended pavement markings for greenway trails and roadway crossings. If desired design treatments are not covered in the MUTCD manual, they may be offered to FHWA for interpretation and official ruling. The FHWA provides an online database where past official rulings can be found (https://mutcd.fhwa.dot.gov/orsearch.asp) which may provide useful when progressing through the design process.

(link: Manual on Uniform Traffic Control Devices)



THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION COMPLETE STREETS PLANNING AND DESIGN GUIDELINES

This publication, released in 2012, includes detailed information on the processes, street types, and recommendations for designing complete streets in North Carolina. The guidelines are meant to help both NCDOT and municipalities with thinking through planning and designing new streets or improving existing infrastructure that all modes of transportation can use, be they pedestrians, bicyclists, or motor vehicles.



While all design standards referenced are valuable to planning and designing Concord's pedestrian and bicycle network, special attention should be paid to AASHTO, MUTCD, and ADA guidelines.

(link: NCDOT Complete Streets Planning and Design Guidelines)

AMERICAN WITH DISABILITIES ACT (ADA)

While elements such as curb ramps, slopes, and railings that are referenced in AASHTO or MUTCD guides, these guides do not explicitly reference compliance with ADA standards. There are several manuals listed below that provide standards for the construction of accessible facilities to comply with the American with Disabilities Act.

- 2010 ADA Standards for Accessible Design
- ABA Accessibility Guidelines for Outdoor Developed Areas
- Public Rights-of- Way Accessibility Guidelines (PROWAG)
- Proposed guidelines have been developed but are not yet adopted by the Department of Justice
- 2017 ICC/ ANSI A117.1 Accessible and Usable Buildings and Facilities
- US Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG)

Meeting these requirements is important for any bicycle and pedestrian network to do such that the most users can participate.

OTHER VALUABLE RESOURCES

- U.S. Department of Transportation FHWA – Separated Bike Lane Planning and Design Guide
- 10 Techniques for Making Cities More Walkable
- Center for Disease Control and Prevention – Parks and Trails Health Impact Assessment Toolkit
- National Association of City Transportation Officials (NACTO) – Design Guide Archives
- Small Town and Rural Design Guide – Facilities for Walking and Biking
- American Trails
- Pedestrian and Bicycle Information Center
- Rails-to-Trails Conservancy
- America Walks – Learning Center
- International Mountain Biking Association
- FHWA Course on Bicycle and Pedestrian Transportation

ELEMENTS OF A MULTI-USE PATH NETWORK - TRAIL TYPES

Multi-use path networks are interconnected pedestrian and bicycle transportation facilities of various forms that allow people of all ages, abilities, and income levels to connect to desired destinations. These facilities must accommodate pedestrians and bicyclists and are intended for recreation and commuter uses. Facilities can run adjacent to roadways (like sidewalks, multi-use paths, or cycle track) or along independent alignments (like greenways trails) and can take different forms based on available land, intended usage, and the overall contribution to a greater connected system.

Many cities and towns have invested significant dollars in pedestrian and bicycle facilities, but few have a complete network that provides safe and convenient connections throughout the community. Access to primary destinations like schools, parks, retail and business centers along a safe and convenient route, while also minimizing exposure to vehicular traffic, is critical to implementing a successful system.

User comfort is also a vital facet of a multimodal network. Additional separation between vehicles and pedestrians/cyclists or reducing vehicle speeds for a safer walking and bicycling experience is important to create a more enjoyable network. Concord has great potential to serve both residents and visitors with a viable multi-modal transportation network.

GREENWAY TRAILS

As the most common type of trail, greenways can be defined as linear open space areas, often associated with wildlife corridors or valuable vegetative buffers. Most often located within a dedicated easement or public utility right-of-way, greenway trails usually include a developed (hard) surface to allow ease of usage for bicycles and other wheeled vehicles. Developed surfaces are most commonly asphalt, concrete or crushed stone. The width of the trail can vary from ten to fourteen feet, with ten feet being the most common. Communities around North Carolina including, Raleigh, Charlotte and Wilmington have recently updated their standard width to 12 feet due to the high usage seen on built greenways.

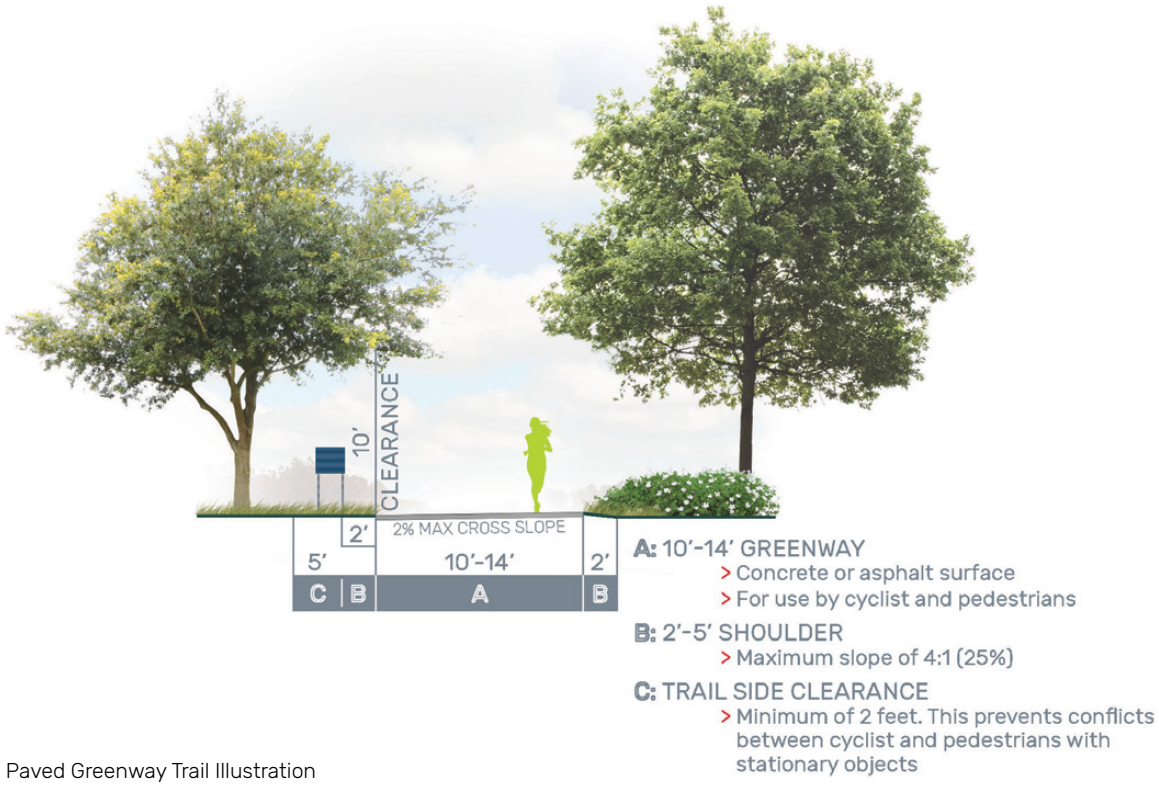


Figure 1 – Paved Greenway Trail Illustration

MULTI-USE PATHS

Usually located immediately adjacent and parallel to a roadway, shared multi-use paths are 10-14 feet in width for two-way traffic flow and are physically separated from vehicular travel through vegetated landscape strips, rumble strips or site furnishings (street lights, way finding signage or benches). Multi-use paths often share the right-of-way (ROW) with collector and highway roads with higher volumes and moderate-to-high speeds (15 – 55 MPH)[1]. As roadway speed increases so should the separation width between the vehicular path of travel and the shared multi-use path facility. Specific details regarding path width, separation width, landscape material, maintenance, crossing design or intersection with and connection to other multi-modal facilities should be considered during a detailed corridor study.

Multi-use paths should be located with consideration to a safe clear zone. Highway design manuals specify the distance from the edge of roadway to the multi-use path based on the posted speed of the road and average daily trips. This distance can be mitigated by installing curb and gutter or a vertical barrier to protect trail users from vehicles. The clear zone distance should be considered at the planning stage to determine the adequate right-of-way width required and possible increase in costs for the installation of curb and a closed drainage system. Multi-use paths can offer a more comfortable experience for cyclists as compared to on-road facilities such as bike lanes or wide outside shoulders located in heavy traffic environments and their inclusion within a network allows for reduced roadway crossing distances.

Multi-use paths are designed to be part of a transportation system, providing off-road routes for a variety of users. The primary users of multi-use paths are bicyclists and pedestrians, including pedestrians using mobility devices such as manual or motorized wheelchairs. While they may coincidently provide a recreational experience, multi-use paths differ from other types of trails with their transportation focus and serving as a supplement to on-road bike lanes, shared roadways, bike boulevards, and paved shoulders. They may extend or complement a roadway network. Multi-use path design is similar to roadway design but on a smaller scale and for lower speeds. Whether located within a highway right-of-way, provided along a riverbank, or established over natural terrain within an independent right-of-way, multi-use paths differ from sidewalks and trails in that they are primarily designed for bicyclists and others for transportation purposes such as commuting to work.[2]

For purpose of this plan, multi-use paths are paved facilities and are parallel to the road, connecting users from residential, civic, social, and employment areas to the greenway network.

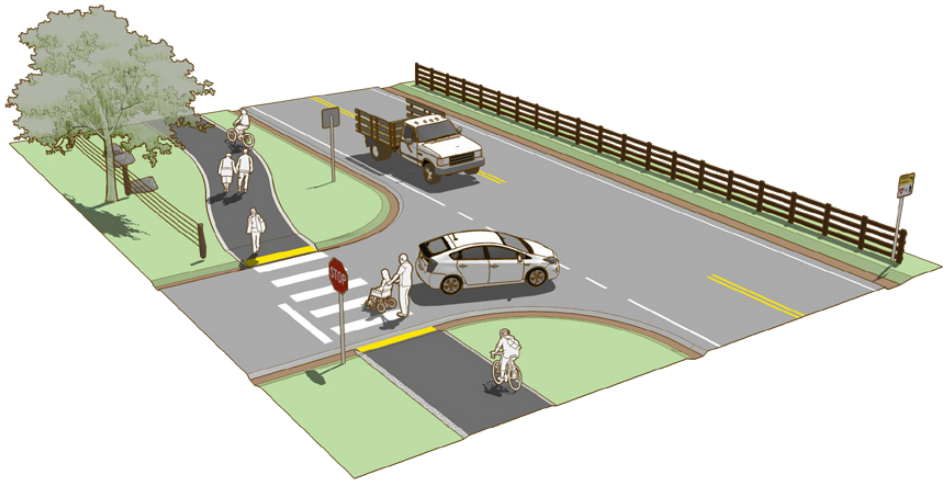


Figure 2 – Paved Greenway Trail Illustration

1 U.S. Department of Transportation, Federal Highway Administration. Small Town and Rural Multimodal Networks, 2016.

2 http://www.fhwa.dot.gov/environment/bikeped/framework.htm and https://www.fhwa.dot.gov/publications/research/safety/pedbike/05137/05137.pdf

SIDEWALKS

Sidewalks are dedicated to and designed for use by pedestrians. They should be safe, comfortable, and accessible to all. Sidewalks are physically separated from the roadway by a curb or unpaved buffer space and are paved. Like multi-use paths, sidewalks are typically parallel to a roadway but are designed for pedestrians only, not for bicycles or other recreational purposes.



Figure 3 – Paved Greenway Trail Illustration

STREAM CORRIDOR TRAILS

For purposes of this plan, stream corridor trails are defined as trails adjacent to stream or river corridors that are typically located within the floodway or floodplain.

This master plan suggests determining the surface of stream corridor trails during the detailed corridor analysis. While paved trails are best practice, the City may make more tangible progress in adding trail miles by considering natural surface trails in the short-term while planning to pave the trails when funding becomes available. While natural surface trails can present a higher degree of maintenance and are not accessible to all, they require less capital investment, engineering, and disturbance. Local interest groups and volunteers have been known to assist with both trail construction and maintenance, allowing the City to implement more miles of trails in the short-term.

It should be noted that there are challenges when including stream corridor trails into the transportation network. There is coordination with North Carolina Department of Transportation (NCDOT) in order to provide access under bridges where streams cross under state roads. There are also other permitting agencies like United States Army Corps of Engineers (USACE) and the Federal Emergency Management Agency (FEMA) that may be involved in obtaining approvals to construct.





In general, trails located along streams are typically asphalt or concrete to mitigate periodic flooding. Often, an undisturbed vegetated buffer is located between the stream bank and the trail to help stabilize streambanks, moderate stream flow, and filter pollutants. Located within the floodway, the materiality of trail cross sections should be carefully considered to provide an adequate foundation, stabilization, and non-slip surface depending on the frequency and velocity of flood events. Greenways adjacent to streams pose a variety of design challenges that should be considered during planning and project selection, including:

Urban Streams - Dense urban conditions restrict trails to the floodway and may require installation of railings, and/or retaining walls to stabilize stream banks.

Regular Flooding – Trail surface within the floodway that are regularly inundated should be carefully selected. Often concrete is the best solution for these areas. While there is a higher construction cost, maintenance savings for repairs quickly balance the initial investment.

Bench Modifications Beneath Bridges

These greenways stay at the stream elevation when crossing beneath vehicular bridges. Special design considerations and materials are recommended at these locations. Common materials include concrete trail surfaces, retaining walls (segmental block, cast-in place, pile and panel are often required to protect the trail from erosion) and safety rails. Connections up to the surface street network are desirable at most locations.

FEMA Regulated Streams - When working within the regulatory floodway, trail design (regardless of surface type) should minimize any change in ground elevation where possible. Any construction or increase in ground elevation within the floodway triggers detailed hydraulic modeling and required approvals through the Local Floodplain Administrator and possibly Federal Emergency Management Agency (FEMA).

Isolated Asphalt – Many stream corridors include areas of jurisdictional wetlands. Care should be taken to locate boardwalks that cross these wetlands with future maintenance in mind. Asphalt should be avoided if a trail section is located between boardwalks and cannot be accessed by paving equipment for resurfacing. Concrete is the best surface type in this condition as it provides a longer surface life and can be repaired in batches using the adjacent boardwalks.



BIKE FACILITIES

In North Carolina, the bicycle has the legal status of a vehicle. Cyclists have full rights and responsibilities when on the road and are subject to the same rules and regulations that govern the operation of a vehicle. When riding on the road, cyclists must ride on the right and in the same direction as traffic. All traffic signs and signals must be obeyed, and hand signals should be used to communicate intended movements. Bicycles must also be equipped for night riding with the appropriate front lamp and rear reflector. Thus, riding on the road and being treated with the same status as a vehicle can be intimidating for most recreational riders. As such, safer more comfortable provisions should be made with a multi-modal transportation system that caters to the bicycle.

There are various bike facilities that can be accommodated based on existing site conditions. Some are incorporated into a mixed traffic scenario, mixing with cars in the same space, while other facilities are visually or physically separated from traffic. The definitions and graphics as provided below were obtained from *"Small Town and Rural Design Guide – Facilities for Walking and Biking"* and *"NACTO Urban Bikeway Design Guide"*[3].

Bike Lanes

Bike lanes allocate an exclusive space for bicyclists with a designated 5-foot striped lane, pavement markings, and signage and enable bicyclists to ride at their chosen speed without interference from traffic. Conventional bike lanes are located directly adjacent to motor vehicle travel lanes and run curbside when no parking is present or adjacent to parked cars on the right side of the street. They typically follow the same direction as motor vehicle traffic and have no physical barriers (bollards, medians, raised curbs, etc.) that restrict vehicular encroachment into the bike lane.

Benefits of conventional bike lanes include:

- Increases use comfort and confidence on busy streets.
- Creates separation between bicyclists and automobiles.
- Increases predictability of bicyclist and motorist movement and interaction.
- Increases streets' carrying capacity.
- A visual reinforcement of the bicyclists' right to the street.

Bike lanes are most conducive on streets with:

- ≥ 3,000 motor vehicle average daily traffic.
- A posted speed ≥ 25 mph.
- High transit vehicle volume.



Figure 4 - Bike Lane Illustration

3 http://ruraldesignguide.com/ and https://nacto.org/publication/urban-bikeway-design-guide/

Buffered Bike Lanes

A Buffered Bike Lane is a conventional bike lane paired with additional buffer space to separate the motor vehicle traffic lane and/or parking lane from the bicyclists. Multiple pavement markings are typically used to delineate the edge of the travel way for both motor vehicles and bicyclists.

Benefits of buffered bike lanes include:

- Provides greater shy distance between vehicles and bicyclists.
- Provides space for bicyclists to pass other bicyclists without encroaching into adjacent vehicle traffic.
- Encourages bicyclists to ride outside of the door zone when buffer is located between parked cars and the bike lane.
- Provides a greater space for bicycling, but not so great that the bike lane is mistaken for a travel or parking lane.
- Appeals to a wider cross-section of bicycle users.
- Encourages bicycling by contributing to the perception of safety among bicycle network users.

Buffered bike lanes can be incorporated:

- Anywhere a standard bike lane is being considered.
- On streets with high travel speeds, high travel volumes, and/or high amounts of truck traffic.
- On streets with extra lanes or extra lane width.



Figure 5 – Buffered Bike Lane Illustration: Travel Side Buffer

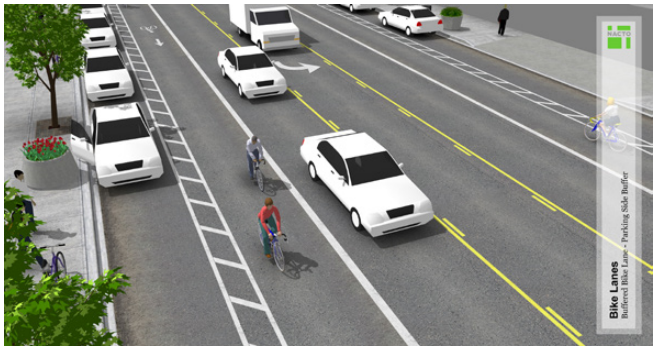


Figure 6 – Buffered Bike Lane Illustration: Parking Side Buffer

Contra-Flow Bike Lane

Contra-flow bicycle lanes are designed to allow bicyclists to ride in the opposite direction of motor vehicle traffic by converting a one-way street into a two-way street. One direction is for vehicles and bikes while the other direction is for bikes only. Contra-flow lanes are separated with yellow center lane striping. While the contra-flow bike lane works best on low-speed and low volume streets, it does introduce new challenges and additional conflict points as motorists may not expect on-coming bicycle traffic.

Benefits of contra-flow bike lanes include:

- Provides connectivity and access to bicyclists traveling in both directions.
- Reduces dangerous wrong-way riding.
- Decreases sidewalk riding.
- Influences motorist choice of routes without limiting bicycle traffic.
- Decreases trip distance, the number of intersections encountered, and travel times for bicyclists by eliminating out-of-direction travel.
- Allows bicyclists to use safer, less trafficked streets

Contra-flow bike lanes can be incorporated:

- On streets where large numbers of bicyclists are already riding the wrong way.
- On corridors where alternate routes require excessive out-of-direction travel.
- On corridors where alternate routes include unsafe or uncomfortable streets with high traffic volumes and/or no bicycle facilities.
- Where two-way connections between bicycle facilities are needed along one-way streets.

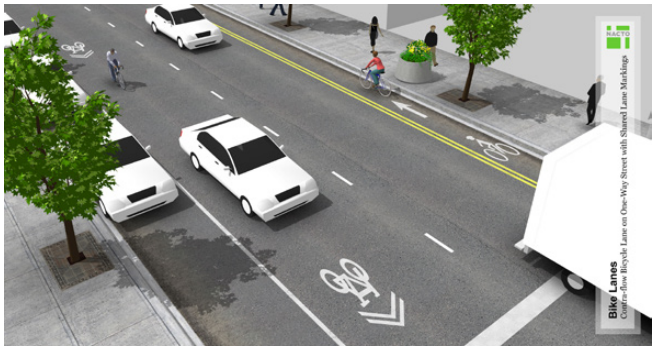


Figure 7 – Contra-Flow Bike Lane Illustration

Left-Side Bike Lane

Left-side bike lanes are conventional bike lanes located on the left side of one-way or two-way median divided streets. Left-side bike lanes offer advantages along streets with heavy delivery or transit use or frequent parking turnover on the right side.

Benefits of left-side bike lanes include:

- Avoids potential right-side bike lane conflicts.
- Improves motorists' visibility of bicyclists by having the bike lane on the driver's side.
- Provides consistent facility configuration in locations where right-side travel lanes are subject to rush hour parking restrictions and other flexible uses.
- Minimizes door zone conflicts next to parking as there are fewer door openings on vehicles' passenger side.
- Fewer bus and truck conflicts as most bus stops and loading zones are on the right-side of the street.

Left-side bike lanes can be incorporated:

- On one-way streets or median divided streets with frequent bus stops or truck loading zones on the right- side of the street.
- On streets with high parking turnover.
- On streets with rush hour parking restrictions.
- On streets with high volumes of right turn movements by motor vehicles.
- On streets with a significant number of left-turning bicyclists.
- On streets where traffic enters into a merge lane on the right-hand side, as from a freeway off-ramp.
- For favorable alignment to connect to a multi-use path, two-way cycle track, or other bicycle facility.

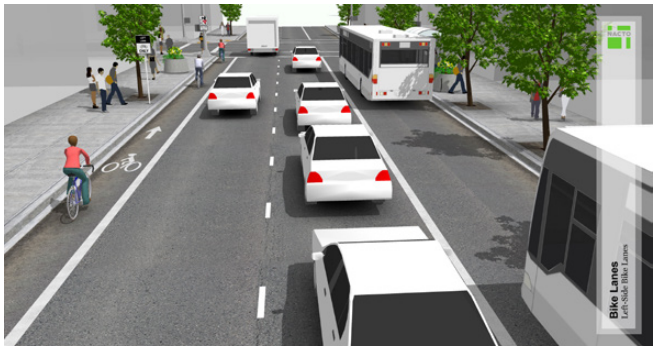


Figure 8 – Left-Side Bike Lane Illustration

Shared Bike Lane

Shared bike lanes use shared lane markings, or "sharrows," to indicate a shared lane environment for bicycles and automobiles. Shared bike lanes reinforce the legitimacy of bicycle traffic on the street, recommend proper bicyclist positioning, and may be configured to offer directional and wayfinding guidance.

However, utilizing shared lane markings should not be considered a substitute for bike lanes, cycle tracks, or other separation treatments when these types of bicycle facilities are warranted and/or where space permits. Shared lane markings can be used as a standard element in the development of bicycle boulevards to identify streets as bikeways and to provide wayfinding along the route. Shared bike lanes are typically not appropriate on streets with a speed limit above 35 mph.

Benefits of shared bike lanes include:

- Encourages bicyclists to safely position themselves in lanes too narrow for a motor vehicle and a bicycle to comfortably travel side by side within the same traffic lane.
- Alerts motor vehicle drivers to the potential presence of bicyclists.
- Indicates a bicycle path through difficult or potentially hazardous situations (e.g. railroad tracks).
- Advertises the presence of bikeway routes to all users.
- Provides a wayfinding element along bike routes.
- Keeps bicyclists out of the "door zone."
- Encourages safe passing by motorists.
- Requires no additional street space.
- Reduces the incidence of sidewalk riding.
- Reduces the incidence of wrong-way bicycling.

Desirable shared bike lane marking applications:

- When the speed differential between bicyclist and motorist travel speeds is very low, such as:
  - On bicycle boulevards.
  - On low volume, traffic calmed, shared streets with a designed speed of < 25 mph.
  - On downhill segments, preferably paired with an uphill bike lane.
  - On streets where the traffic signals are timed for a bicycling travel speed of 12 to 15 miles per hour.
- As a reasonable alternative to a bike lane in limited circumstances, such as:
  - Where street width can only accommodate a bicycle lane in one direction.
  - Within single or multi-lane roundabouts.
  - Along front-in angled parking where a bike lane is undesirable.



- To strengthen connections in a bikeway network, such as:
  - To fill a gap in an otherwise continuous bike path or bike lane, generally for a short distance.
  - To transition bicyclists across traffic lanes or from conventional bike lanes or cycle tracks to a shared lane environment.
  - To direct bicyclists along circuitous routes.
- To clarify bicyclist movement and positioning in challenging environments such as:
  - Through intersections.
  - Through a combined bike lane/turn lane.



  - In the presence of a double turn lanes. Double turn lanes are undesirable for bicyclists.



  - In the street alongside separated bikeway facilities such as cycle tracks, to permit continued use of the street by bicyclists who prefer to ride in the street.



Cycle Track

A cycle track is an exclusive bike facility, physically separated from motor traffic and distinct from the sidewalk, that combines the experience of a separated path with the on-street infrastructure of a conventional bike lane. Cycle tracks have several different forms, but all provide space that is primarily used for bicycles and are separated from motor vehicle travel lanes, parking lanes, and sidewalks. In contrast to bike lanes, where on-street parking exists, cycle tracks are located on the curb-side of the parking lane.

Cycle tracks can be one-way or two-way and can be at street level, sidewalk level, or an intermediate level. When located at street level, cycle tracks can be separated from motor traffic by raised medians, on-street parking, or bollards. When a cycle track is located at sidewalk level, a curb or median separates it from motor traffic, while pavement markings such as color/texture separates the cycle track from the sidewalk. Separating cyclists from motor traffic offers a higher level of safety than other bike lane facilities and are attractive to a wider array of users.

One-Way Protected Cycle Track

One-way protected cycle tracks are bikeways at street level and use a variety of methods for physical separation from the motor vehicle travel lane such as a raised curb, planters, or a parking buffer.

Benefits of one-way protected cycle tracks include:

- Dedicates and protects space for bicyclists in order to improve perceived comfort and safety.
- Eliminates risk and fear of collisions with vehicles.
- Reduces risk of 'dooring' compared to a bike lane
- Eliminates the risk of a doored bicyclist being run over by a motor vehicle.
- Prevents double-parking, unlike a bike lane.
- Low implementation cost by making use of existing pavement and drainage and by using the parking lane as a barrier.
- More attractive for bicyclists of all levels and ages.

One-way protected cycle tracks can be incorporated:

- On streets with parking lanes.
- On streets where conventional bike lanes would be stressful to bicyclists due to multiple lanes, high traffic volumes, high speed traffic, high demand for double parking, and high parking turnover. While there are no US standards for bicyclist and motor vehicle volumes that warrant the implementation of cycle tracks, several international documents provide basic guidance (refer to the *NACTO website* for such references).
- On streets where intersection conflicts can be effectively alleviated using parking lane setbacks, bicycle markings through the intersection, and other signalized intersection treatments.
- Along streets with high bicycle volumes.
- Along streets with high motor vehicle volumes and/or speeds.



Figure 9 – One-Way Protected Cycle Track Illustration: Raised Curb and Parking Buffer



Figure 10 – One-Way Protected Cycle Track Illustration: Planter and Parking Buffer



Figure 11 – One-Way Protected Cycle Track Illustration: Parking Buffer

Raised Cycle Track

Raised cycle tracks are vertically separated from motor vehicle traffic and many are paired with a furnishing zone between the cycle track and the vehicle travel lane and/or pedestrian area.

Raised cycle tracks may be one-way or two-way and at either the level of the adjacent sidewalk or set at an intermediate level between the roadway and sidewalk. The latter is used to segregate the cycle track from the pedestrian area. A raised cycle track may also be combined with a parking lane or other barrier between the cycle track and the vehicle travel lane. At intersections, the raised cycle track can either be dropped to street level, merging with vehicle traffic or at sidewalk level, where bicyclists cross with pedestrians.

When placed adjacent to a travel lane, one-way raised cycle tracks may be configured with a mountable curb to allow entry and exit from the bicycle lane for passing other bicyclists or to access vehicular turn lanes. This configuration has also been known as a 'raised bike lane.'

Benefits of Raised Cycle Tracks include:

- Dedication and protection of space for bicyclists in order to improve perceived comfort and safety.
- More attractive biking environment to a wider range of bicyclists at all levels and ages.
- Keeping motorists from easily entering the bicyclists space.
- Encouraging bicyclists to ride in the bikeway rather than on the sidewalk.
- Visual reduction of the width of the street when provided adjacent to a travel lane.
- Minimizing maintenance costs due to limited motor vehicle wear.
- Cost reduction on new roadway construction; a raised cycle track can be less expensive to construct than a wide or buffered bicycle lane.

Raised cycle tracks can be considered:

- Wherever a bicycle lane would be the standard recommendation.
- Along higher speed streets with few driveways and cross streets.
- Along streets where bike lanes would cause many bicyclists to feel stress due to factors such as multiple lanes, high traffic volumes, high speed traffic, high demand for double parking, and high parking turnover.
- On streets where intersection conflicts can be effectively alleviated using parking lane setbacks, bicycle markings through the intersection, and other signalized intersection treatments.
- On streets with numerous curves where vehicle encroachment into bike lanes is a concern.
- Along streets with high bicycle volumes.



Figure 12 – Raised Cycle Track Illustration

Two-Way Cycle Track

Two-way cycle tracks are also known as "protected bike lanes," "separated bikeways," and "on-street bike paths." They are physically separated bicycle facilities that allow bicycle movement in both directions on one side of the road. Two-way cycle tracks share some of the same design characteristics as one-way tracks but may require additional considerations at driveway and side-street crossings.

A two-way cycle track may be configured as a protected cycle track—at street level with a parking lane or other barrier between the cycle track and the motor vehicle travel lane—and/or as a raised cycle track to provide vertical separation from the adjacent motor vehicle lane.

Benefits of two-way cycle tracks include:

- Dedication and protection of space for bicyclists in order to improve perceived comfort and safety.
- Reducing the risk of 'dooring' compared to a bike lane.
- Eliminating the risk of a doored bicyclist being run over by a motor vehicle.
- Reduction of out of direction travel by providing contra-flow movement on one-way streets.
- Low implementation cost when making use of existing pavement and drainage and using parking lane or other barrier for protection from traffic.
- More attractive biking environment to a wider range of bicyclists at all levels and ages.

Two-way cycle tracks can be considered:

- On streets with few conflicts, such as driveways or cross-streets, on one side of the street.
- On one-way streets where contra-flow bicycle travel is desired.
- On streets where more destinations are on one side of the street, thereby reducing the need to cross.
- On streets with extra right-of-way on one side.
- To connect with another bicycle facility, such as a second cycle track on one side of the street.
- Along streets on which bike lanes would cause many bicyclists to feel stress because of factors such as multiple lanes, high traffic volumes, high speed traffic, high incidence of double parking, and high parking turnover.
- On streets where intersection conflicts can be effectively alleviated using parking lane setbacks, bicycle markings through the intersection, and other signalized intersection treatments.
- Along streets with high bicycle volumes.
- Along streets with high motor vehicle volumes and/or speeds.

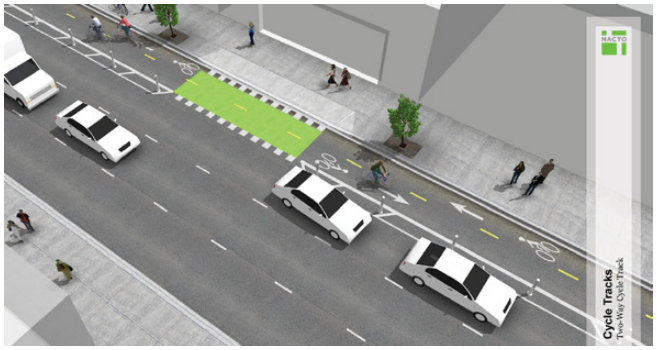


Figure 12 – Two-Way Cycle Track Illustration

Bicycle Boulevard

A bicycle boulevard is a low-stress, shared roadway bicycle facility designed to give bicycles travel priority within a roadway shared with low volume and low speed motor vehicle traffic. Bicycle boulevards use signs, pavement markings, and volume and speed management techniques to create safe and convenient bicycle facilities. The basic components of a safe bicycling environment are often found on existing local streets that have low speeds and volume.

Establishing bicycle boulevards on existing streets can materialize by enhancing these streets with design treatments tailored to existing conditions and desired outcomes. Providing bicycle boulevards not only benefit cyclists, but also creates peaceful streets, benefiting residents and improving safety for all road users.

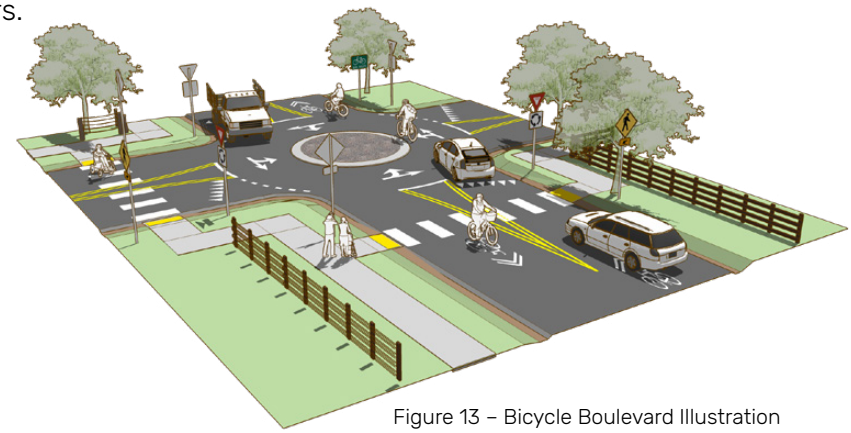


Figure 13 – Bicycle Boulevard Illustration

Paved Shoulder

Paved shoulders on the edge of roadways can be enhanced to serve as a functional space for bicyclists and pedestrians to travel in the absence of other facilities with more separation. Paved shoulders are only recommended for rural roads with lower motor vehicle volumes.

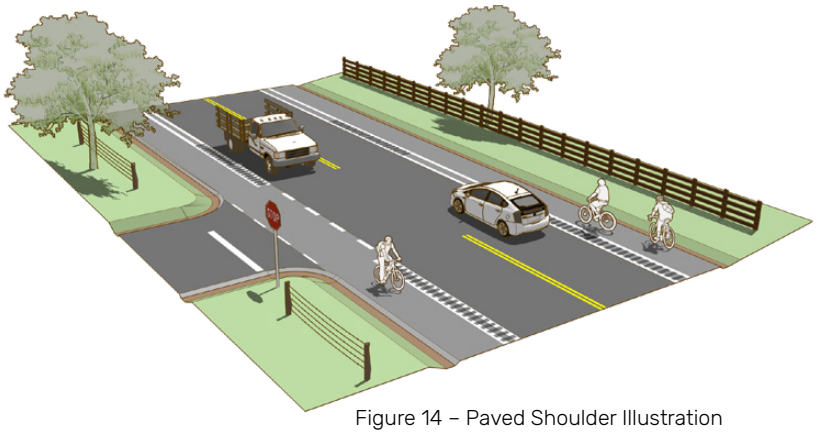


Figure 14 – Paved Shoulder Illustration

DESIGN + CONSTRUCTION CONSIDERATIONS

For the connectivity system to succeed and thrive, certain design and construction considerations should be evaluated and incorporated where applicable. In this section, you will find the following considerations:

1. User Needs
2. Considerations for Environmental Protection
3. Considerations for Greenway Trail Physical Components
4. Considerations for Riparian Greenway Trails
5. Considerations for Greenway Trails in Utility Corridors
6. Considerations for Greenway Trails in Roadway Corridors
7. Typical Cross Sections
8. Control Measures
9. Intersections / Crossings
10. Comfort Facilities + Furnishings + Artwork
11. Branding + Wayfinding
12. Permitting
13. Construction Administration

1. USER NEEDS

Pedestrian users have a variety of needs, abilities, and potential impairments, of which are most often determined by a user's age. Age can be a contributing factor in a pedestrian's walking speed and the perception of their surrounding environment. Children walk more slowly than adults and have different environmental perceptions as they cognitively develop. Older adults may also walk slowly and may require the assistance of physical devises to walk, hear, or see. While a user's mobility will vary significantly across all users, the pedestrian connectivity system should accommodate all users to the greatest possible extent.



Dog walkers make up a large contingent of users on greenway trails. Design dimensions should take into dog size, leash length, walking style, all of which vary greatly. Thus, there is a wide range of possible facility dimensions that can accommodate dog walkers. However, greenway trails that have been designed to accommodate wheelchair users will likely provide the necessary space for the typical dog walker. Dog waste stations at trailheads or periodically along the trail improve the experience for these users.



Runners and joggers are frequently found on greenway trails, many of which prefer softer surfaces like rubber, bare earth or crushed rock. Trail surface is the primary design consideration when taking runners into account. If softer surface options cannot be accommodated, asphalt is preferred over concrete.

Strollers are often used on greenway trails. The size, design, and capacity of strollers vary greatly and the greenway's design considerations when accommodating strollers should examine stroller size and the ability and speed of the adult pushing the stroller. Also, a stroller's small pivoting front wheels that aid in maneuverability may limit their use on unpaved or rough surfaces. Curb ramps are especially useful to these users as lateral overturning is a safety concern.

As populations age, **mobility assistance device users** grow. These devises are typically manual or powered wheelchairs and maneuvering them, particularly around a turn, requires additional space. Providing space for proper turning radii movements at appropriate locations is part of accessible design and shall be considered when designing greenway trail systems.

Bicyclists come in a variety of ages and abilities. Variations of cyclists typically occur with the type of equipment being used (e.g. a conventional bicycle, mountain bike, road bike, recumbent bicycle or tricycle), and the cyclist's skill and comfort level riding on the provided bicycle facility. The design of a connected bicycle system should consider multiple bicycle types, using dimensions that are appropriate to accommodate the broad range of styles and abilities. Proper bicycle facilities require clear, open space without visual obstruction and with a preferred five feet or larger width within which a bicyclist can safely operate.

Electric scooters now are in frequently use on paths and roadways in cities across North Carolina and the country. Per North Carolina legislation, a scooter is not classified as an electric personal assistive mobility device (EPAMD) but rather a vehicle.[4] As such, the City should consider how these devices will be monitored and their proper use enforced or whether local ordinances will be enacted to regulate the time, place, and manner for operating the scooters.











4 https://nccriminallaw.sog.unc.edu/its-a-bird-its-a-scooter-its-an-overnight-sensation-but-is-it-legal/

2. CONSIDERATIONS FOR ENVIRONMENTAL PROTECTION

One of the many positive benefits of greenway trails is that they link transportation, recreation, and conservation. As such, the network must be planned, designed, constructed, and maintained to preserve the area's natural resources. Some recommendations to consider for developing and maintaining greenway trails to reap the benefits of natural resource conservation may include the following.

Protecting ecologically sensitive areas should be part of trail development prioritization. Environmental impacts need to be weighed against land availability, costs, accessibility, access, and aesthetics. When possible, it is wise to prohibit greenway trail development that negatively impacts:

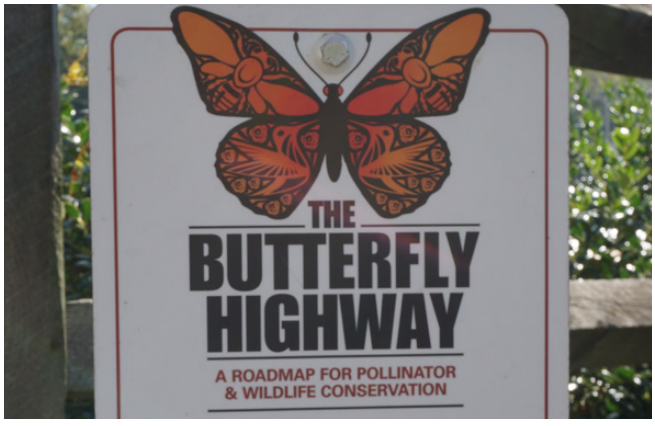
- Wetlands, creeks, streams, rivers, and lakes
- Habitat for rare and endangered species
- Steep slopes and poor soils not capable of supporting trail or road development
- Sensitive forests
- Public water supplies
- Unique geologic features

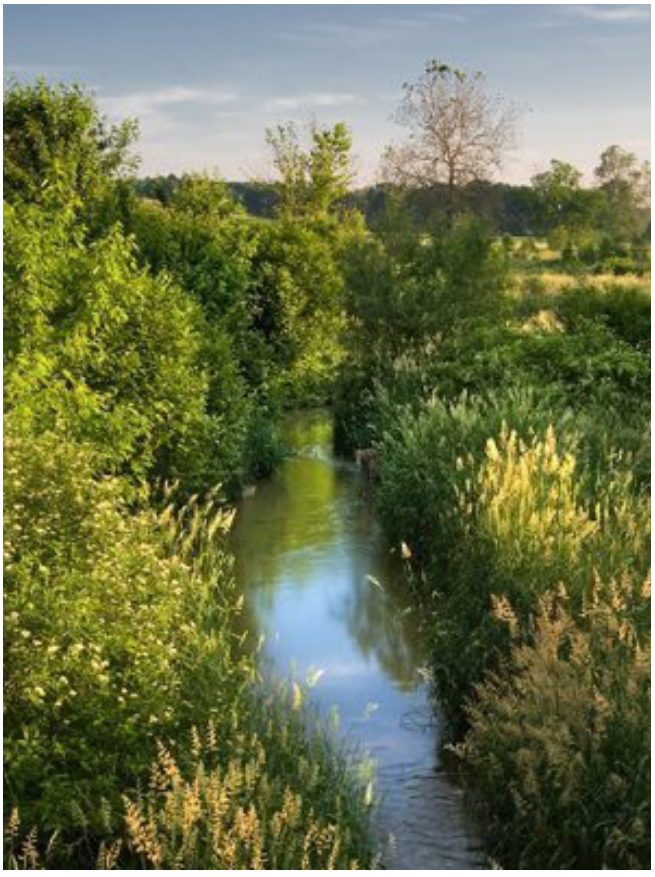
Providing and maintaining buffers that protect sensitive natural areas adjacent to greenway trails is critical to ensure that these natural areas sustain ecological quality and value. Regardless of how sensitively a greenway trail is designed and constructed, they inevitably impact the environments through which they travel. Due to impacts like soil compaction, increased runoff and erosion, and habitat fragmentation, the implementation of vegetative buffers is imperative when planning and designing greenway trails. However, not all buffers will be the same.

Their recommended widths will vary to respond to specific conditions, such as:

- Sensitivity of the natural area being impacted
- Type of greenway trail
- Grade and soil types
- Desired user experience







Using best practices for stormwater management along the greenway trail is critical to avoid standing water on the trail. Using natural infiltration systems like vegetated swales are more ecologically and hydrologically advantageous than engineered stormwater solutions like storm drains and catch basins.



Using low impact methods when planning, designing, constructing, and maintaining greenway trails that touch environmentally sensitive areas is preferred. In Concord, most greenway trails occur within riparian systems. As such, low impact methods will lessen the impacts to these sensitive areas, aiding in the preservation of existing vegetation, wildlife, water resources, and soils. By employing low impact methods, a greenway trail system becomes a durable facility that serves the public and provides a quality experience.



Clearing & Demolition - While tree preservation and environmental protection is critical for preserving and/or improving ecological, hydrological, and recreational value throughout the pedestrian and bicycle network, it may be necessary to clear vegetation along the length of a new multi-use path or greenway trail. When clearing and demolishing existing vegetation to create greenway facilities, the following guidelines should be considered:

- Prior to any clearing or demolition activities, set and inspect tree protection fence and limits of disturbance.
- Protect existing, natural, and man-made cultural assets. These may include historic sites, cultural landmarks, and significant views.
- Comply with all environmental protection regulations from governing agencies; regulations that apply to erosion control, water quality, NCDENR requirements, and others depending on location.
- Preserve all riparian buffers.
- All debris, garbage, dumped items, hazardous material, creek obstructions, and extraneous or abandoned structures shall be removed from greenway property.
- Prune vegetation in accordance with the National Arborist Association and ANSI A300 standards.
- Remove invasive species where possible and avoid planting species known to have invasive and aggressive growth habits along the greenway.



Drainage and erosion control are necessary environmental controls to maintain a stable and low maintenance facility. Water flowing along the trail edge or across the path with enough volume and velocity to remove soil results in undesirable erosion conditions. The resulting degraded greenway trail then has the capability to impact adjacent or downstream water resources. Dispersed infiltration stormwater features such as vegetated swales, are recommended along the network to minimize erosion for reduced maintenance and improved aesthetic. Following contours also helps reduce erosion issues, minimizes maintenance, and increases user experience.

Drainage measures are dependent on the trail surface material. Paved surfaces should consider the following guidelines:

- A 2% cross slope will combat most drainage issues and is recommended to be used for both the main path and shoulders. A maximum 1:6 slope may be used for the shoulders, but 2% is preferred.
- In cut conditions where uphill water is collected and directed to a catch basin, water should be captured and directed under the greenway in a suitably sized drainage pipe.
- To help prevent erosion along shoulders, install low groundcover up to the edge of the greenway.



Natural Surface trails should consider the following guidelines.

- Designing natural surface trails with rolling grades is preferred. "Rolling grade" describes the series of dips, crests, climbs, and drainage crossings that form a sustainable trail that responds to existing contours.
- Contour trails should be outsloped 5% from the ridge face so that water sheets water off the trail during rain events. This design guideline disperses and sheds water off the trail in a non-erosive manner.
- Natural surface trails should be designed so that water sheets across, rather than down its tread.
- Avoid fall line greenway trails when possible. A fall line trail generally follows the most direct line downhill.
- Erosion can be controlled through frequent grade reversals, dividing the trail into smaller watersheds. Breaking up the drainage area this way allows the drainage attributes from one section to not affect another section. It is recommended to incorporate a grade reversal every 20 to 50 linear feet.

Grading & Earthwork - Ideally, grading and earthwork will be kept to a minimum, with grading activities occurring only as necessary to build the trails, connections, and associated amenities. Filling the floodplain or wetlands will not be permitted unless doing so provides the best greenway alignment in terms of safety, water quality, and/or stream bank restoration. If doing so, placing fill in the floodplain shall be conducted in strict compliance with local and state regulations and their respective policies. All grading activities shall follow all jurisdictional permitting requirements.



3. CONSIDERATIONS FOR GREENWAY TRAIL PHYSICAL COMPONENTS

Surfacing

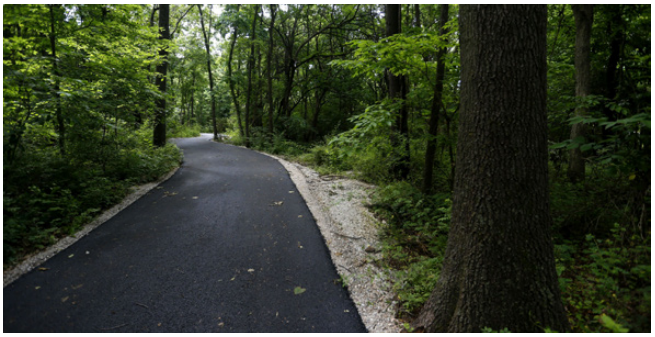
Greenway trail **surfacing** should be selected to accommodate the intended use and intensity along the trail. Surfacing should also account for flooding frequency, drainage, topography, available construction budget, and maintenance levels.

To be compliant with American Disabilities Act (ADA) Accessibility Guidelines, a greenway trail must be constructed with a paved surface (asphalt or concrete). Where there is little to no topography, compacted gravel fines can be used as an ADA compliant surface. However, these surfaces require more maintenance and cost over time, but does provide a softer, tactile pavement option.

Asphalt is popular with trail users for its smooth, continuous, and joint-forgiving attributes. It also boasts lower material and installation costs but does require more maintenance than concrete. It has a life span of about 10-15 years if constructed properly on suitable sub-grade, which is about half that of concrete. Asphalt is typically used for Concord trails, as it offers durability and the cost of installation and maintenance is not cumbersome.

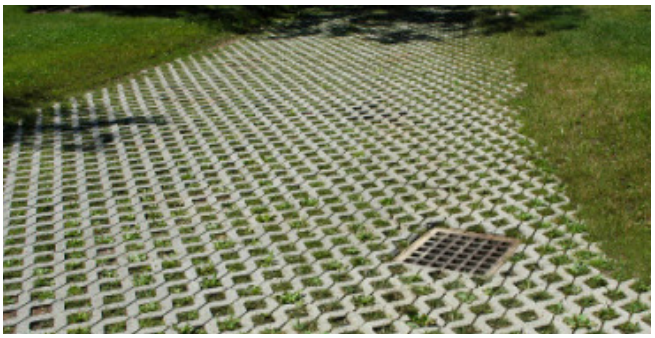
Concrete, however, can last 25 years or more when properly constructed and maintained. As one of the most expensive surfaces, the cost of concrete is often a limiting factor when selecting surface materials. However, concrete should be considered in areas that frequently flood or in urban conditions due to its durability over asphalt and lower maintenance needs. It should be noted, however, that concrete is not the preferred surface by runners, as its hardness is not easy on the joints. And control joints should be saw cut vs. troweled.

Permeable paving is another surface option, but being twice the cost of asphalt to install, it should only be used under special circumstances. When using permeable paving, the area must have proper drainage; permeable paving is not suitable in floodplain conditions or in areas where ponding and sedimentation occurs. Maintenance protocol for permeable paving must be established, as this material needs to be vacuumed to remove debris after storm events in order to maintain its permeable properties.











Natural surface greenway trails are typically located in environmentally-sensitive corridors that exhibit conditions that can support bare earth, wood chip, or crushed stone trails. Natural surfaces offer a low-impact solution, typically found in less developed areas, where a trail is being laid out for future hard surface paving or where a more natural experience is preferred. The most common use of natural surface trails is for mountain biking. Additional guidance on design and construction of mountain biking facilities can be found at the International Mountain Biking Association's (IMBA) website – www.imba.com

Some options for natural surfaces include:

- Bare earth
- Rock
- Mulch, wood chip, or other native materials
- Crushed stone or screenings (not to be used in flood-prone or environmentally sensitive areas or on steep slopes)

Regardless of surface material, positive drainage must be provided. Trails that are bench cut should be done so with minimal removal of existing vegetation and grade reversals shall encourage sheet flow across the trail.

Stormwater features are recommended to be located along the network at small scales to minimize erosion. Longitudinal slope should not exceed 5% with the cross slope not exceeding of 2%.



A: 8'-10' BENCHED GREENWAY
> Concrete, asphalt or natural surface
> For use by cyclist and pedestrians

B: 2' SHOULDER
> Maximum slope of 4:1 (25%)

C: TRAIL SIDE CLEARANCE
> Minimum of 2 feet. This prevents conflicts between cyclist and pedestrians with

Boardwalks are used when crossing sensitive or inundated areas, small creeks and wetlands in order to limit environmental impacts. Boardwalks can be constructed with timber, modular concrete systems or cast in palace concrete decks. Recycled material has durability advantages but come with structural limitations and can only be used in limited applications. Modular concrete boardwalk systems provide low-impact installation solutions and durability and are gaining popularity. Permatrak™ is one such system being used in Charlotte and by the National Park Service. Cast in place concrete decks are also being used in Mecklenburg County and are in service. This is a non-proprietary design that uses wood for sub-structure and cast in place concrete decks to greatly extend boardwalk life.

Maintenance can also be reduced by replacing wooden pickets that are traditionally used. Municipal maintenance departments have shared that replacing individual pickets is time consuming, costly and labor intensive. By replacing pickets with vinyl coated, chain link fence many municipalities around the state have removed this maintenance challenge. The fence panel is tensioned into place and readily available.





A few considerations to keep in mind when analyzing the desire to implement boardwalks:

- Boardwalks should have a 10' minimum clear span if railing are not used. If railings are used or on sections with higher use expectations, a 12' width is preferred.
- A 6-inch curb rail is recommended for all boardwalks. However, a 42-inch guardrail will be required if there is a 30-inch or greater grade change between the boardwalk surface elevation and the ground elevation below.
- A structural engineer should be consulted for foundation post sizing and footing design. Foundation posts are typically marine-grade timber or auger piers with screw anchors. Structural evaluation and design of footings should include uplift as well as loading considerations for flood events.
- Minimize slippery timber decking surfaces following rain events. A topcoat of non-skid sealer can be used to increase slip resistance.
- Local, state, and federal permits will be required when constructing a boardwalk is within jurisdictional wetlands.

Regardless of the selected surface material, proper foundation design and installation will maximize the greenway trail's longevity. And all surfaces have their advantages and disadvantages, and each must be examined to ascertain which surface is most appropriate in any given location.



Toby Creek Greenway, Mecklenburg County - Cast in Place Concrete Decks

Width

- Eight feet is the minimum width recommended for a low volume, shared use greenway trail. Any trails receiving federal funding must be a 10' minimum per AASHTO requirements.
- Ten feet is recommended for most moderate to heavy use situations.
- Twelve feet (and in very heavy use areas, 14-feet) is appropriate for trail sections with high concentrations of multiple user types. Where space permits, a separate lane of 5-feet minimum may be provided for pedestrian only use.

Lateral Clearance

- Provide 2-foot minimum shoulder on both sides of the greenway trail.
- Provide an additional 5-feet of clearance (7-feet total) when signage or other site furnishings are provided.
- Provide 5-feet shoulders in fill sections
- Provide 5-feet shoulders in cut sections.

Overhead Clearance

- Provide 10-feet recommended, 8-feet minimum clearance from overhead obstructions.
- Provide convex mirrors at blind corners and underpass approaches with poor sight lines.



Striping

Stripe greenway trails with expected heavy use or high concentrations of multiple users.





Surface Grade

- Comply with ADAAG standards when possible.
- Provide a 2% cross slope from crown in both directions to positively drain off the trail.
- Provide a 48-inch height safety rail within 6-feet of pavement edge when:
  - Slope is greater than or equal to 3:1 and drop of 6-feet
  - Slope is greater than or equal to 2:1 and drop of 4-feet
  - Slope is greater than or equal to 1:1 and drop of 1-foot

Accessible Greenway Trails

Constructing **accessible greenway trails** that meet the American with Disabilities Act Accessibility Guidelines (ADAAG) may prove difficult and sometimes prohibitive. It is necessary to comply with these requirements where possible. However, there are certain circumstances where a facility may be exempt from compliance. These exceptions are made when compliance would:

- Harm significant cultural or natural resources,
- If compliance would significantly change the intended purpose of the greenway trail,
- Construction method requirements necessary to become complaint are against federal, state, or local regulations, or
- Terrain prevents compliance.

More information regarding accessible recreation facility requirements can be found at the United States Access Board's website.

Crime Prevention Through Environmental Design (CPTED)





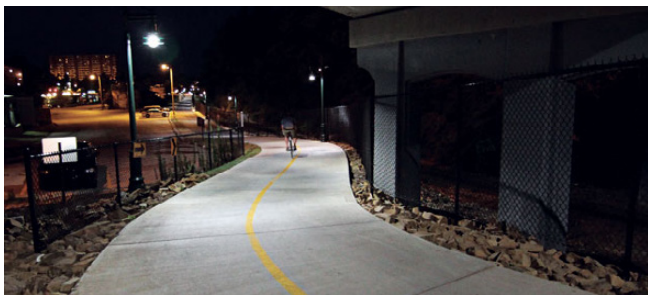
Both actual and perceived personal safety sways one's decision to use a greenway facility. The inherent safety (or lack thereof) also determines whether a community will welcome and support the system. Both actual threats (criminal acts or infrastructure failure) and perceived concerns (fear of crime or fear of injury) must be addressed and can be done so through Crime Prevention Through Environmental Design (CPTED). CPTED is "…a multi-disciplinary approach for reducing crime through urban and environmental design and the management and use of built environments. CPTED strategies aim to reduce victimization, deter offender decisions that precede criminal acts, and build a sense of community among inhabitants so they can gain territorial control of areas and reduce opportunities for crime and fear of crime."[5]





As such, it is recommended to apply CPTED guidelines throughout the network when appropriate, some of which are listed below.

- Fencing along greenway trails should not obstruct the view of trail users.
- Where long stretches of greenway are fenced, provide intermittent openings to allow trail users to enter and exit the corridor.
- Good visibility from all access points is needed for all trail users and its neighbors.
- Signage should include contact numbers to report suspicious behavior, graffiti, and maintenance issues.
- All understory vegetation along greenway trails should not exceed 3-feet height.
- Vertical clearance under trees, over the trail, should be 8-feet minimum.
- Hostile plant material (e.g. native vegetation with thorns) can be strategically used to discourage access to/use of an area.
- Add anti-graffiti application to surfaces where appropriate.
- Where lighting is installed, illumination should:
- Be sufficient for a face to be identified up to 20-yards away.
- Provide uniform coverage that eliminates dark spots.
- Provide good color rendition – recommend using LED or metal halide lamps.
- Not be obstructed by tree canopies.
- Lighting should respond to site conditions and meet the minimum safety standards set forth by the Illuminating Engineering Society of North America (IESNA). Remember too, that light quality is as important as light quantity. Whether too bright or not bright enough, poor lighting, can curtail safety.



5 http://www.cpted.net/

4. CONSIDERATIONS FOR RIPARIAN GREENWAY TRAILS

As mentioned, most greenway trail development in Concord occurs in riparian corridors. These corridors include rivers, streams, creeks, and wetlands. And depending on the size of the floodplain area, riparian corridors can offer both recreational and open space preservation opportunities. All greenway trails constructed within riparian corridors should be examined for stormwater, wildlife habitat, and floodplain development impacts.

Routing and Alignment

- Greenway trails should follow the natural contours when possible.
- Avoid construction along erosion prone fall lines – these areas generally cannot be maintained.
- Choose the narrowest point to cross wetlands.
- Avoid construction immediately adjacent to streambanks. Construct all trails at the maximum distance from streams as possible. While Concord does not require a minimum distance trails need to be from the stream, the City has designated River/Stream Overlay Districts as described in Concord's Development Ordinance, Article 4, Environmental/Land-Disturbing Activities, that require an undisturbed buffer and a vegetated setback along Class 1 and Class 2 streams. Both Article 4 and Article 1, Section 1.5.3 of Concord's Stormwater Technical Standards Manual call out specific development and land disturbing activities that are exempt or allowed within a designated stream buffer. Those exempt and allowed activities that most directly correlate with the development of an open space connectivity network include:
  - Bridges (allowed)
  - Greenway/hiking trails (allowed)
  - Stream restoration (exempt)
  - Streambank stabilization (allowed)
  - Planting vegetation to enhance the stream buffer (exempt)
  - Removal of understory nuisance vegetation, e.g. invasives (exempt)
  - Wetland restoration (exempt)
- Consider stream restoration opportunities where feasible. Stream restoration projects frequently reshape the floodplain to allow the stream to access its floodplain.
- Design logical access points and points of interest to avoid informal "cow paths" that trample floodplain vegetation or infringe into sensitive areas.

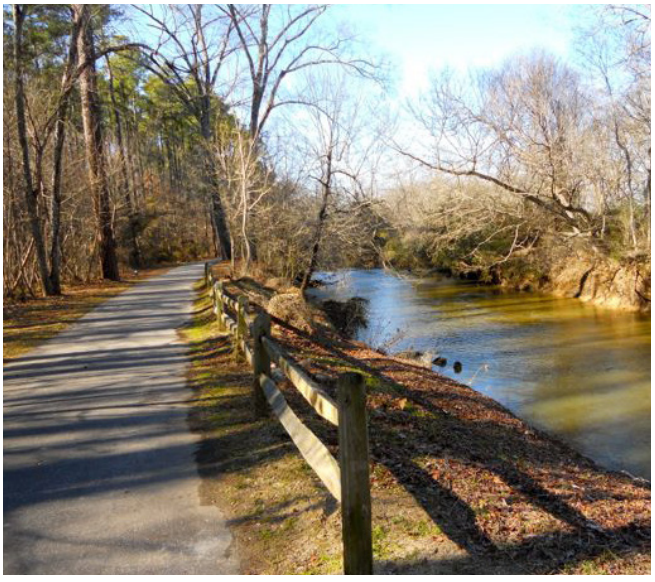


Materials and Management

- Concrete, due to its durability and lower maintenance requirements, is the recommended surface for greenway trails that will see regular flooding. Concrete should always be used on the approaches and beneath vehicular bridges as these areas are regularly inundated with standing water.
- It is not advisable to use permeable paving in riparian corridors (or in other areas with poor drainage). Sediment transport through sheet flow clogs the permeable system and requires vacuuming and extra maintenance after all storm events.
- Do not use gravel or crushed fines in riparian corridors that are prone to flooding. These materials erode easily and can contribute to sediment build up in streams.
- When traversing wetlands, use elevated systems like boardwalks to preserve the wetland ecosystem.
- Stormwater should be managed using natural infiltration systems such as vegetated swales.
- Avoid concentrated channels which may lead to larger pipes and high velocity of stormwater run-off causing uneven greenway surfaces.







5. CONSIDERATIONS FOR GREENWAY TRAILS IN UTILITY CORRIDORS

- Corridors that house underground utilities such as water, sewer, natural gas, or buried electric as well as above-ground utilities such as telephone, cable, or overhead electric can serve the needs of greenway trail users. A few things to consider when utilizing a utility corridor for greenway trail use.
- All greenway trails utilizing a utility corridor will require procurement of a trail easement from the land owner.
- Review and plan for each utility's policies regarding specifications for construction, repair, maintenance, access requirements.
- Most utility companies require that specific design guidelines be followed. These include but are not limited to, routing and alignment, width limitations, landscaping requirements, and restrictions on structures.
- Ten-feet width must be provided if motor vehicles will be accessing the trail for utility maintenance.
- In sanitary sewer easements, the greenway trail edge should be 10-feet minimum, where possible, from manhole rims.
- For Duke Electric utility corridors, a minimum separation of 25-feet is required between the greenway trail and any associated electrical equipment (such as guy wires, power poles, and towers; based on Duke Energy ROW requirements for greenway trails).





6. CONSIDERATIONS FOR MULTI-USE PATHS

Trails located within the road right-of-way (ROW) provide wider, more comfortable widths than sidewalks and can accommodate multiple users when properly designed. Paths within ROWs work best along roads that have few driveway crossings along its length and with services primarily located on one side. Multi-use paths can be used on one or both sides of a roadway. In determining the appropriate cross-section planners should evaluate the following:

- Roadway cross-section: How will cyclists access destinations on both sides of the road? If the roadway does not offer safe comfortable travel for cyclists, then MUPs on both sides may be appropriate. Low volume, low speed roads may not require separated cycling on both sides, while high volume, high speeds roads may.
- Adjacent land-use: Are there schools, libraries, parks, retail areas or other destinations on both sides of the roadway that users would likely access? Again, focus on the cycling movement to determine if access is supported.
- Distance to crossings: How far would a cyclist have to ride on the roadway to access the multi-use path? Is there a safe crossing to access the MUP?

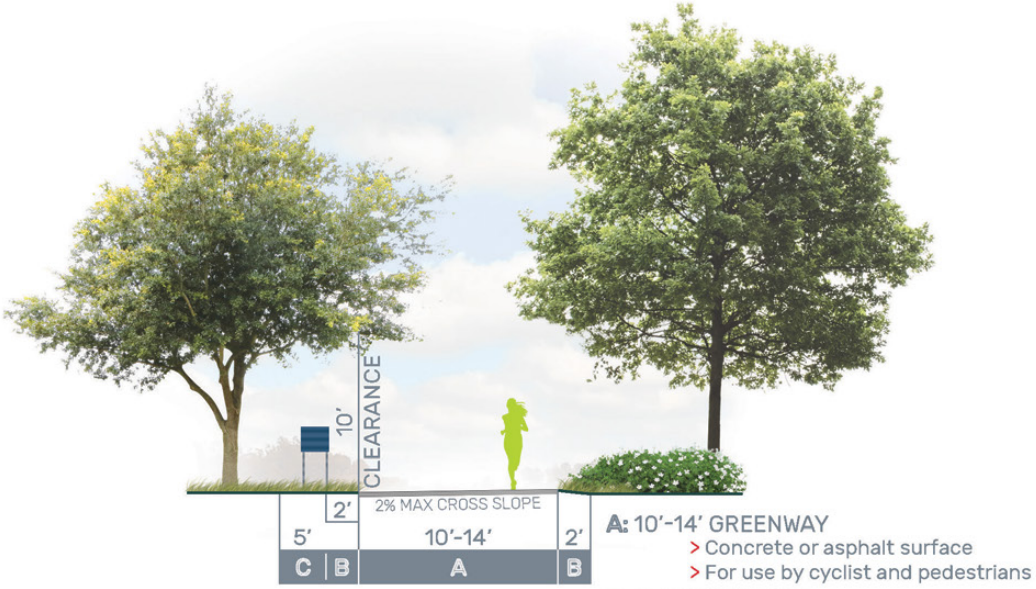


Multi-use paths are also advantageous when a road travels along a riverfront or other natural feature.

- Multi-use paths are 10-feet minimum; necessary for bicyclists to pass other users safely.
- A 5-foot minimum vegetated buffer between the multi-use path and the road edge should be provided. NCDOT will conditionally allow a 3-foot buffer when right-of-way dimensions are constrained.
- Provide appropriate regulatory and wayfinding signage and crossing treatments at driveway entrances crossings.
- All greenway trails constructed within NCDOT ROW require an encroachment permit.
- Follow NCDOT standards and specifications when providing multi-use paths along NCDOT roadways.



7. TYPICAL CROSS SECTIONS



A: 10'-14' GREENWAY
- > Concrete or asphalt surface
- > For use by cyclist and pedestrians

B: 2'-5' SHOULDER
- > Maximum slope of 4:1 (25%)

C: TRAIL SIDE CLEARANCE
- > Minimum of 2 feet. This prevents conflicts between cyclist and pedestrians with stationary objects

Figure 15 – Typical Paved Greenway Cross Section



A: 10'-14' MULTI-USE PATH
- > Concrete or asphalt surface
- > For use by cyclist and pedestrians

B: 2' SHOULDER
- > Maximum slope of 4:1 (25%)

C: TRAIL SIDE ZONE
- > Minimum of 2 feet. Width determined by traffic volume and speed, and pavement edge treatment
- > Minimum of 5 feet when considering street tree planting

Figure 16 – Typical Natural Surface Greenway Cross Section



A: 8'-10' BENCHED GREENWAY
> Concrete, asphalt or natural surface
> For use by cyclist and pedestrians

B: 2' SHOULDER
> Maximum slope of 4:1 (25%)

C: TRAIL SIDE CLEARANCE
> Minimum of 2 feet. This prevents conflicts between cyclist and pedestrians with stationary objects

Figure 17 – Typical Natural Surface Greenway Cross Section

8. CONTROL MEASURES

Most greenway trails require some level of control and management to enhance user experience, provide security, or to expand the life of the greenway trail. Features such as trailheads, bollards, or vegetative screening help control greenway access. Bridges allow for environmental control and features such as fences and railing help to control greenway safety.

Access Control

As the City of Concord's greenway system expands, it is essential to provide access to a wide range of users and way finding amenities throughout the system. This can be achieved through establishing trailheads at popular greenway access points. Ideally, trailheads will consist of a paved parking area, signage, restrooms, and a drinking fountain. But ultimately, the size of and amenities provided at the trailhead is contingent upon its location, the size of the parcel of land, and the popularity of the trail being accessed. Trailheads serve several purposes, providing:

- Wayfinding for individual elements as well as larger system;
- A central, public location to disseminate greenway rules, programs, and other information; and
- Convenient parking and entry for greenway users.



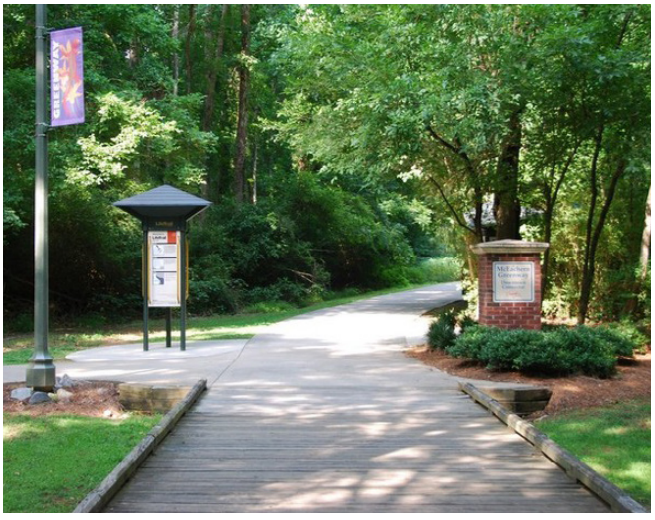
Trailheads are an essential element of a successful and active greenway system and when determining when and where to develop trailheads, consideration needs to be given to locations where:

- prominent greenways intersect,
- multiple greenways and other community trails intersect, and
- a wide range of greenway users can effectively be served.

Trailheads are designated public access points to the greenway trail system, connecting roadways and/or activity centers to the greenway system and may include amenities such as:

- Vehicle and bicycle parking
- restrooms
- seating areas/benches
- shelters and picnic areas
- drinking fountains
- trash and recycle receptacles
- bike share stations
- pet waste stations
- bicycle repair stations
- public art
- lighting
- wayfinding and informational signage

Consider locating trailheads in conjunction with other public facilities or through a shared use agreement with owners of adjacent parking areas. Trailheads could be classified into major and minor categories.



Major trailheads should be established near high population and high use areas such as large residential and commercial developments, transportation nodes, or popular parks. Such siting makes the trailhead accessible to a larger number of users and provides greater access to the greenway trail system.

- Major trailheads can have a large paved parking lot with emergency and maintenance vehicle access and turnaround. ADA accessible parking spaces must be provided near the site's accessible route, at a rate of one accessible space per 25 standard spaces.
- Consider one-way vehicle circulation within parking areas to minimize road width.
- Provide user access from local streets when major trailheads are located near neighborhoods.



Example of kiosk typical of a major trailhead

Minor trailheads have minimal infrastructure and can occur at smaller parks, residential developments, or other trail/roadway intersections. Some may include a small parking lot, drinking fountains, benches, trash and recycling receptacles, an information kiosk, and informational signage. Consider negotiating shared parking with adjacent development to capitalize on available land for development of the trailhead. Careful consideration should be given in residential neighborhood connections to discourage public parking, congregating on neighborhood streets, signage, landscaping, and lighting.

A **defined trail edge** provides visual separation, delineating the public trail space from private property, separating users from dangerous conditions like a steep grade change, or to discourage "cow paths" from forming into and out of the trail system. Various physical elements can define a trail's edge: vegetation, fencing, railings, topography, or walls. Consider trail user safety and wildlife movement when determining applicable edge treatments. Other things to consider are detailed below.

- Fencing is often viewed as a safety measure to prevent unwanted access. When incorporating fence along the greenway to prevent access, a semi-transparent fence four feet tall or less typically provides a sufficient edge to deter most. But fencing that completely blocks visual access to the greenway will restrict casual trail surveillance, thereby resulting in a real or perceived safety issue.
- When fencing is used to denote property boundaries, there must be a balance between the residents' desire for privacy and casual surveillance of the greenway trail. Opaque structures can obscure views and create and uneasy feeling of being enclosed, both of which negatively impacts a user's experience.
- For physical separation to protect against hazardous slopes, semi-transparent fencing or railings, hostile vegetation, or topography, may be appropriate solutions.



Fence creating a defined edge along a path

Vegetative buffers can be used to create privacy screens, provide wildlife habitat, and stabilize precarious soils. When providing vegetative buffers along a greenway corridor, the following should be considered.

- When possible protect, preserve, and maintain existing native vegetation when constructing greenway trails through riparian corridors. Existing vegetation is the first choice for providing separation between the trail and adjacent properties.
- Remove all competing invasive vegetation.
- When trees and shrubs are planted, native species are recommended, as they are the most ecologically sustainable option. Native species typically require less maintenance and often provide a necessary food source and habitat for wildlife, thus offering the most effective method to create wildlife habitat.
- Groundcover and shrub height should be 24-inches maximum to maintain an open sight line.
- Plant the right plant in the right place; responding to topography, sun/shade exposure, and soil moisture.
- Tree canopies shall not obstruct trail illumination from overhead lighting.
- Select and locate plant material to provide seasonal comfort: shade during warmer months and sunlight in the winter.
- Select native, hostile plant material (e.g. vegetation with thorns) to deter greenway users entering unauthorized areas.
- Consider Crime Prevention Through Environmental Design (CPTED) recommendations.
- Mulch regularly to conserve water.
- Trim trees adjacent to the greenway trail to provide an 8-foot minimum vertical clearance.
- Fertilize native plant material only when necessary if soil conditions need repair.

The presence or absence of vegetation and the type of plant material present in a corridor influences the greenway's quality and performance as a wildlife corridor, its ecological sustainability, and the experience for the trail user.

Bollards are physical barriers designed to restrict access by vehicles. Bollards are effective in preventing unauthorized vehicles from accessing the greenway and should be employed at all primary access points and major trail heads.

- Bollards should be 40-inches minimum height and 4-inches minimum diameter.
- Set bollards back from the edge of road by 20-feet minimum.
- If more than one bollard is installed, it is preferable to use an odd number and space bollard 6 feet apart.
- Bollards should have reflectors for night time visibility.
- "No Motor Vehicles" signage (MUTCD R5-3) and/or vertical curb cuts may be used to reinforce vehicular access rules.

It should also be considered that physical barriers may occasionally be ineffective at preventing access and alternately create obstacles to rightful trail users. Other design strategies to accomplish access control utilize signage, landscaping, and curb cut designs to reduce vehicular access.





Environmental Control

Greenway trail bridges are used to cross streams, rivers or other natural features where installing a culvert is not an option. Bridge type and size will vary according to specific site constraints and type of greenway trail, often taking the form of a suspension or a prefabricated clear span bridge. It is also critical to consider emergency and maintenance vehicle access when developing a bridge design for greenway trails.

- Poorly designed trails traversing through water features can impact wetlands and streams and become conduits for sediment, nutrient, and pathogen delivery throughout the watershed. Poor design and construction can also contribute to bank and streambed erosion. As such, it is best to utilize the following guidelines when considering implementation of a trail bridge.
- Bridge deck grade should be flush with adjacent greenway surface elevation to provide a smooth transition. If a gap exists between bridge deck and trail, said gap should be covered with a steel plate.
- Length and height of the bridge cords are dictated by floodway width and anticipated impacts to a stream's base flood elevation.
- The bridge's clear span should include 2-feet additional feet on both ends of the approach to accommodate the shoulder.
- Railings, where warranted, shall maintain a 42-inch minimum height and 48-inches where hazardous conditions exist. If utilizing a picket style rail, maximum opening between pickets is 4-inches.
- A 10-feet minimum overhead clearance is desirable for emergency vehicle access.
- A 10-foot-wide greenway trail bridge should support 10 tons. If wider than 10-feet, the bridge should support 20 tons to accommodate emergency vehicle access.
- When crossing creeks or streams, align the crossing as far upstream as possible and in the narrowest channel section to minimize the impact.
- Trail stormwater features should be implemented before the trail crosses the watercourse.
- All abutments and foundations should be designed and sealed by a professional structural engineer licensed in the State of North Carolina.
- Construction and/or installation of greenway trail bridges will require local building permits, stormwater and land disturbance permits, and FEMA approval.



Safety Control

Railing and fences are necessary features on some bridges, boardwalks, or in areas where a hazardous grade change or incompatible adjacent land use is present. Below are a few guidelines to consider when planning for fencing and railings.

- If grade change requires, railings shall be 42-inches above finished grade and up to 48-inches where more hazardous conditions exist (e.g. a bridge over a highway).
- Picket style fencing presents a safety hazard for bicyclists and may want to be avoided.
- Use durable materials for reduced maintenance.
- Consult local, state, and/or federal regulations and building codes to determine when railing installation is appropriate thus complying with current standards.



9. INTERSECTIONS / CROSSINGS

Roadway Crossings

Pedestrian traffic signals and signage are critical at trail and roadway intersections, particularly at mid-block crossings. Where possible at roadway crossings, the user shall have the opportunity to pass under the street, connect to other sidewalks along the street, or cross at street level with one of these crossings conforming to ADA requirements.

At grade crossings of the road by the trail are the most efficient use of construction and right of way funds that serve several opportunities for a trail. However, at grade crossings also have drawbacks with the potential to create conflicts between greenway trail users and motorists. However, well-designed crossings can mitigate many of these conflicts and provide a high level of safety and comfort for users.

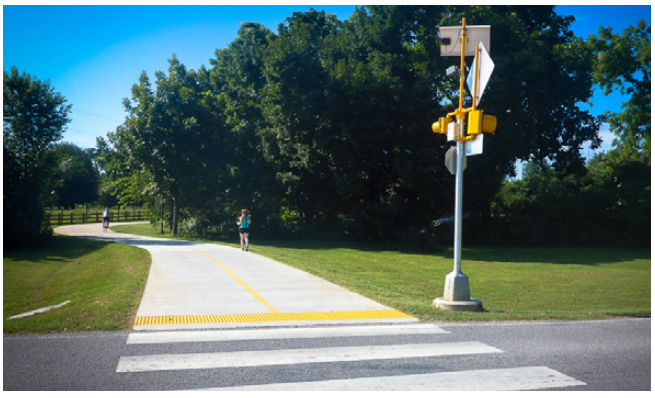
Opportunities for having an at grade crossing is creating visibility of the trail to the community, informing residents and visitors alike that a trail is present and open. The identification of the trail through signage and branding help to establish place and trip origination for trail users. The access is also good for safety as first responders and emergency vehicles have direct access to the trail system from the roadway.

Safety is a concern for at grade crossings and measures must be taken to protect the vulnerable users. Basic two-lane roads typically have the least potential for conflict between crossing trail users and motor vehicles. As roads become bigger with additional lanes and increased speed and volume of motor vehicles, the potential for conflicts with trail users subsequently increases.

Special consideration must be given when delineating at grade crossings. Warning sign types, pavement markings, and other strategies will vary based on the type of roadway the trail crosses. Below are several considerations to evaluate when preparing to design or construct an at grade crossing.

- The increased possibility for conflict between trail users and motor vehicles must be mitigated to provide a comfortable and safe experience for all. Provide adequate sight distance for trail users and motorists with siting, clearing, and other strategies.
- Proper signage and pavement markings alerting trail users and motorists of at grade crossings is critical.
- Warn motorists of approaching trail crossings with pedestrian crossing signage.
- Warn pedestrians and bicyclist of approaching road crossing with appropriate warning signage.
- Install marked/painted pedestrian crossing or a speed table where possible.
- However, care must be taken not to place too many signs at crossings as they may lose their visual impact.
- Minimize length of crossing as much as possible.
- Avoid locating crossings where steep side slopes are created, making them prone to erosion.
- Where curb to curb distance is greater than 75-feet, provide median refuge areas.
- Clearly indicate through signage who has priority within the right-of-way.





When to Use Signals for at grade crossings - A warrant is a condition that an intersection must meet to justify a signal installation. The Manual on Uniform Traffic Control Devices (MUTCD) specifies eight "traffic control signal needs studies", known as warrants. However, "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal." (MUTCD, 4C.01) The final decision is made based upon the traffic engineer's judgment.

Process to determine if a signal is warranted The traffic engineer analyzes vehicle traffic volume, pedestrian activity, intersection crash history, and the physical environment in order to determine whether the intersection warrants a traffic control signal. Engineers examining the intersection may review the following:

- Number of vehicles entering the intersection from all directions during 4-hour and 8-hour periods
- Vehicular volumes during peak hours, classified by vehicle type for traffic movement in all directions
- Pedestrian and cyclist volume on each crosswalk in all directions, including children, the elderly, and/or persons with disabilities, during each hour of the day
- How the crossing fits into the larger bicycle and pedestrian network bot planned and existing.
- Requests from participants attending nearby facilities and activity centers that serve the young, elderly, and/or persons with disabilities
- Posted speed limit
- Physical layout
- Crash experience/history

Different warrants require detailed analysis of different aspects of the above information.

Roadway Intersection Crossings – At locations where a trail crosses at an existing street intersection, City of Concord and NCDOT signals provide necessary pedestrian signage, pavement markings or signals. The advantage of a crossing at an existing intersection is that there are already measures in place for controlling traffic that can be modified to accommodate trail users. Signalized crossings at intersections provide the most protection for users. Desired crossings that are within +/- 400 feet of an existing signalized intersection should be diverted to the existing intersection. Doing so avoids traffic operation issues that arise when two crossings are in close proximity.

Additional features that may be implemented at an existing intersection may include:

- Bike signals
- Green paint (Must obtain experimental letter from FHWA)
- Limiting turning movements of motor vehicles, I.E. "No Turn on Red"
- Reducing crossing lengths
  - Pedestrian refuges in median and when space allows
  - Reducing radii and creating curb bulb outs
  - Moving stop bars back from the middle of intersection



Mid-block Trail Crossings

A mid-block at grade crossing can serve as a convenient point of access for the trail when an existing intersection is not present or when it becomes impossible to route the trail to an intersection. Because no existing traffic control features are likely present, steps need to be taken to ensure the safety of trail users and mitigate potential conflicts with motor vehicles. Even though North Carolina Law gives pedestrians in the crosswalk the right of way, good design encourages compliance and improves safety. Designing mid-block crossings is evaluated on elements such as vehicular traffic, greenway trail traffic, line of sight, vehicle speed, road type and width, and other factors like proximity to major attractions.

The trail crossing types described below are for mid-block crossing situations. Mid-block crossings are those that occur solely for the purpose of a greenway trail crossing a surface street. Descriptions of the trail crossing types are as follows:

Midblock Trail Crossing, 2- and 3-Lane Roads

- Warning and stop signs at locations where the trail meets the road
- Reduce road width or create curb and gutter bulb outs at the crossing to reduce the length of the crossing
- Change of pavement surface on the approach of the crossing
- 10-foot wide longitudinal crosswalk, across road with curb ramps at each end
    - Curb ramp width should match the width of the of the trail.
- Fluorescent yellow-green warning signs along road at approaches to trail crossing
    - Recommended 35 mph or less / Required over 35 mph
- Distinctive markers at approach to trail – boulders, plantings, etc.
- Alternative pavement surface
- Rumble strips (in non residential areas), speed tables (in residential areas) or pavement markings at approaches
- Raised crosswalk
- Pedestrian-activated rectangular rapid flashing beacons (all)
- Raised pedestrian refuge in place of center lane
- Planted median in place of center lane; +/- 200 ft. long (each side of trail crossing)
- Trail crossing – striped or imprinted asphalt; flush through median
- Angle crosswalk in the median to orient pedestrian toward on-coming traffic
- Pedestrian-activated High-Intensity Activated crossWalK (HAWK) signal
- Rectangular Rapid Flash Beacon (RRFB)
- Two signal types that my be utilized are the High-Intensity Activated CrossWalk



(HAWK) beacon and the Rectangular Rapid Flash Beacon (RRFB).



Rectangular Rapid Flash Beacon (RRFB)

Midblock Trail Crossing, 4- and 5-Lane Roads (45 mph or Less)

- Warning and stop signs at trail approaches to road
- 10-foot wide longitudinal crosswalk, across road with curb ramps at each end
    - Curb ramp width should match the width of the of the trail.
- Fluorescent yellow-green warning signs along road at approaches to trail crossing
- Distinctive markers at approach to trail – boulders, plantings, etc.
- Alternative pavement surface
- Rumble strips (in non-residential areas) or pavement markings at approaches
- Pedestrian-activated rectangular rapid flashing beacons (all)
- Raised pedestrian refuge in place of center lane
- Planted median in place of center lane; +/- 200 ft. long (each side of trail crossing)
- Trail crossing – striped or imprinted asphalt; flush through median
- Angle crosswalk in median to orient pedestrian toward on-coming traffic
- Pedestrian-activated High-Intensity Activated crossWalK beacon or HAWK signal
- Pedestrian Hybrid Beacon (PHB)

Grade Separated Crossings – Grade separated crossing removes the potential conflict points between trail users and motor vehicles. Sometimes these crossing can be achieved by an existing overpass or bridge where the trail can pass underneath the existing roadway. When existing structures are not present or cannot be suited to fit a trail, new structures often have to be built. While expensive, these structures offer a level of safety and comfort that is unmatched with an at grade crossing.

Pedestrian tunnels and bridges are the most common types of grade separated structures. A structure will be required when crossing any NCDOT controlled access such as an interstate. A structure is also recommended for high volume roadways or if the projected number of users of the trail are expected to be high. Additional warrants for a structure for a grade separated crossing include:

- Crossing of any facility with a design speed higher than 45 miles per hour.
- Crossing four lanes or more.
- Crossing a road with poor horizontal or vertical sight distances.



Pedestrian Tunnels or greenway trail underpasses provide critical connections between areas separated by barriers like railroads or high speed/volume roadway corridors. Safety is a major concern with underpasses as users may be temporarily out of sight from the public or may experience poor visibility. Design criteria for pedestrian tunnels include:

- Vertical clearance: 10-foot minimum
- Width: 12-feet required
- Provide positive drainage with a 2% minimum longitudinal slope to avoid pooling of stormwater. Where appropriate, incorporate trench drains at the tunnel entrance to intercept water before it enters the tunnel. Pedestrian tunnels may also be designed to flood periodically if necessary.
- Pedestrian tunnels should have a 10 foot-candles minimum daytime illuminance. This can be achieved through artificial and/or natural light. Night time illuminance levels should reach 4 foot-candles.
- Design to allow for wildlife crossing if located in a natural area
- Roadway Bridge spanning trail is most desirable solution
- Requires NCDOT encroachment agreement (if crossing state maintained road)
- Existing box culverts may sometimes be retrofitted but may require additional hydraulic analysis.
- It is recommended to post warning signage in advance of the pedestrian tunnel on both approaches that indicate necessary warnings regarding visibility or other safety concerns.
- Consider providing convex mirrors at blind corners and at tunnel approaches with poor sight lines.
- Pedestrian tunnels are most appealing when they are open, accessible, and exhibit a sense of safety.





Pedestrian Bridges or greenway trail overpasses are often built over large man-made features like highways. Greenway trail bridges are exceptionally expensive and should only be used in locations with an extraordinary need. Site specific design and construction specifications will vary per bridge location, but safety should be the primary design consideration. Design criteria for pedestrian bridges include:

- Clear Width: 10-feet required, 12-feet preferred
- 54-inch guard rail on both sides
- H5 (10,000LBS) Loading requirement minimum, for light maintenance and emergency vehicles.
- Fenced cover where trail crosses highways/ busy streets
- Requires NCDOT encroachment agreement (if crossing stataintained road)
- Shall meet governmental safety requirements and be structurally engineered to support proposed use
- Always engage a structural engineer in new bridge designs or before making alterations or additions to an existing bridge.
- While more expensive, a decorative, artistic bridge will draw attention to the trail network and could serve as a landmark.







Routing Trail Beneath Roadway Alongside Existing Streams Crossing

- Vertical Clearance: 8-foot minimum, 10-feet desired
- May require additional hydraulic analysis
- Requires NCDOT encroachment agreement (if crossing state-maintained road)
- Modification to bench must not impact structure
- Concrete surface recommended to extend life of trail in regularly flooded location.



Bike lane connections to and from greenway trails should have smooth transitions. Detectable pavement warnings and signage shall be placed at approaching connection points and avoid, when possible, locating bike lane connections at the bottom of steep slopes. Doing so aids in user safety and helps prevent stopping hazards.



At the **intersection with other greenway trails,** users need to be informed that an intersection is approaching and of the potential to encounter different user types from multiple directions. This notification can be provided through signage and/or unobstructed sight lines. Other design criteria include:

- Trails should intersect at 90 degrees when possible with clear sight lines.
- Include wayfinding signage at intersections.
- A roundabout may be a viable intersection design option to slow user speeds and maintain efficient circulation.
    - Consider using low growing (no more than 24-inches high), native landscape that require minimal maintenance and provide clear sight lines.
    - Other material, like boulders and public art, can be used in the center of roundabouts to discourage shortcut paths across the central island. However, clear sight lines under 36-inches should be maintained.

Median refuge islands provide a stopping place between vehicular travel lanes such that trail users can navigate crossing one direction of traffic at a time. These islands improve user safety by minimizing exposure with vehicular conflicts as it breaks the crossing distance into more manageable sections. A few things to consider regarding median refuge islands:

- They are appropriate at both signalized and unsignalized crosswalks.
- The refuge island must be accessible, preferably via and at grade passage through the space rather than ramps and landings.
- Refuge islands can be landscaped. However, the landscape shall not compromise trail users' visibility across the crosswalk. Consider low growing, native shrubs and ground cover that require minimal maintenance and do not reach heights greater than 18-inches.
- Road debris may collect at refuge islands. Therefore, they do require frequent maintenance efforts.
- The approach nose to the island must be highly visible with appropriate regulatory signage.





10. COMFORT FACILITIES + FURNISHINGS + ARTWORK

When designing a functional and inviting greenway trail system, comfort facilities, furnishings, lighting, artwork, and other unique amenities must work together to enhance the overall experience for all trail users. Including furnishings along the route provides the opportunity to rest from exercising or to contemplate as a break from causally traversing the trail. Placing seating strategically along the path, especially in communities with an aging population will encourage these users to enjoy the trails to their fullest potential.

When utilities are available, safety furnishings should be included. These features allow users to maintain a sense of comfort and safety. Water fountains and water-bottle filling stations allow users to stay hydrated and adequate lighting provides visibility when natural light is no longer available.

Other amenities commonly available to users include restrooms, overlooks and viewing areas, bike racks, bike maintenance stations, public art, and landscape. Consider grouping these amenities together, providing a centralized rest stop or comfort station. Throughout this section, guidelines for each of the previously mentioned amenities are provided for consideration.



Public restrooms

Public restrooms are one of the most critical amenities. They must be responsive to a wide range of needs and careful consideration must be given to multiple factors before locating them. Available land, size of trailhead, distribution of existing restroom facilities within system, utility availability, and user's needs are some of the factors that need to be explored.

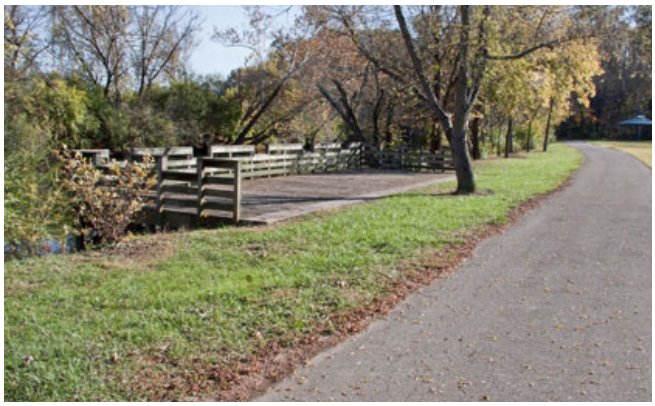
Prior to undertaking any restroom building design, Concord should consult with design professionals who can guide the City through building codes, health and safety codes, ADAAG standards, and local development codes. It is worth noting that restrooms demand substantial maintenance and service. Access to these amenities should be a primary factor when planning for restroom building construction. Other considerations include:

- Prioritization of locating restrooms at trailheads in existing parks, outside the floodplain, and with access to water and sewer.
- Reviewing the overall system to identify gaps where restrooms could be placed.
- Locating restroom structures adjacent to vehicular access to accommodate security measures and maintenance activities.
- Taking advantage of natural light and ventilation to the greatest extent possible.
- Placing and appropriate quantity of bicycle parking close to restrooms to discourage informal parking and impeding trail users.
- Providing durable and vandal resistant finishes.

Overlooks + Viewing Areas

Overlooks and viewing areas may be provided to take advantage of pristine views or cultural features along a corridor. A space separate from but adjacent to the primary circulation path allows users to rest, observe, contemplate, and enjoy their surroundings; natural features like a beautiful grove of trees, an interesting rock outcropping, a winding wetland system, or other areas that have natural or historic significance.

Observation areas should accommodate pedestrians and cyclists, with adequate space to circulate and to keep the observer from interfering with primary trail traffic, seating and/or leaning rails, and bike racks. If the structure is 30-inches above ground elevation, railings must be included, which can provide the perfect mounting structure for interpretive and educational signage.





Trash + Recycle Receptacles

Trash and recycle receptacles assist in the necessary maintenance and overall appearance of the system. Signage should be provided in conjunction with the receptacles indicating the bin for trash and the bin for recycling, and which recyclables are accepted. Other guidelines to consider include:

- Locating receptacles at every trailhead and each seating area.
  - Placement of other receptacles will depend upon the location of other facilities and areas of group activities are programmed.
- Consider using solar powered, compacting receptacles in areas with adequate sunlight.
- Receptacles should be set back 3-feet from the edge of the trail, but still accessible to maintenance personnel and trail users.
- Receptacle size and style should be selected with the following criteria in mind:
- Expected trash/recycling amount
- Maintenance and collection program limitations
- Durability
- Animal and weather proof features



Drinking Fountains

Drinking fountains allow trail users to hydrate and potentially prolong their experience on the trail. Ideally, drinking fountains should be located near restrooms, at trailheads, within parks and other public gathering places along the greenway trail. Additional considerations and guidelines include:

- Availability to the City's water service.
- Drinking fountains should be located at least 5-feet from the edge of the trail.
- Standard and ADA compliant fountains shall be installed to accommodate all users.
- Drinking fountains should be placed on a well-drained surface, typically a concrete slab at 2% slope.
- Consider using durable and vandal-resistant materials.





Seating

Seating throughout the trail network provides a place for users to rest, meet, or contemplate. Benches can be merely utilitarian or designed to create whimsy and identity along specific trails. Picnic tables are also an option to incorporate into the trail system. They provide places for users to congregate for meals, meeting, or to relax. Factors to consider when selecting and locating seating include:

- Locate benches where appropriate and where there is a demand by users along the greenway, ideally in one-mile increments. Seating within 1/2 mile of trailheads is recommended.
- Locating benches and other site furniture 3-feet minimum from the edge of the trail.
- Benches should be 4-feet from restrooms and drinking fountains and 2-feet from trash and recycling receptacles, light poles, and sign posts.
- Provide benches and picnic tables in areas that offer interesting views, are close to an interpretive element, and offer shade or shelter from seasonal conditions.
- Wheelchair access shall be available at picnic tables and alongside benches; provide access with a hardened surface like concrete or asphalt.
- Provide positive drainage away from the bench and the greenway trail.
- Seating should be securely mounted to the ground.
- Heat absorption should be considered when selecting bench material and color.
- Seating does not only have to be manufactured furnishings, but can take the form of seat walls, retaining or planter walls, boulders, or even tree stumps.





Bicycle Parking

Bicycle parking should be as convenient and abundant as automobile parking and should be easily accessible to cyclists while minimizing any conflict with trail user circulation patterns. Bicycle parking should be located on a hardened surface adjacent to, but not blocking other greenway amenities. Bike racks should be in highly visible locations, parallel to the greenway approach and no more than 25-feet from ingress/egress of the trail. It is also recommended that bike parking be installed at least 5-feet from the edge of the trail to avoid greenway traffic conflicts. Consideration should also be given to avoid conflicts with emergency ingress/egress routes, service access, and authorized vehicular areas. Other bicycle parking guidelines include:

- Locating bicycle racks at restrooms, trailheads, points of interest, and overlooks and viewing areas.
- Bicycle racks should support the bike in at least two places.
- Bicycle racks should allow locking the frame and one or both wheels with a U-lock.
- Ensure the rack is securely anchored via in-ground mounting or surface mounting mechanisms.
- Consider bicycle racks that are durable; resisting scratches, rusting, heat absorption, and bending.





Bicycle Repair Stations

Bicycle repair stations are small work stands that offer a complete set of tools necessary for routine bicycle maintenance and repair. Preferred locations for the repair stations include major and minor trailheads and rest stops throughout the trail network. Consider grouping repair stations with other amenities like seating, bicycle parking, and drinking fountains.

While bicycle repair station tools are secured by durable, high security cables, they will still be an enticing target for theft and vandalism. Locating stations in areas of high activity and visibility is one strategy to thwart potential negative behavior.



Public Art

Public art engages the community, ignites imaginations, and creates a memorable experience for greenway users. Art and sculpture can strengthen a greenway's identity and heighten the emotional attachment between Concord's Bicycle and Pedestrian System and its users. Public art can be aesthetic and/or functional, serve as a public attraction or double as seating, shelter, or gathering areas. Art installations throughout the network become landmarks and act as both useful wayfinding mechanisms and a means by which to tell fascinating stories about Concord's culture and history.

- When incorporating art along the greenways, it is recommended to consider the following.
- Artists may be commissioned to create works at a single location or on multiple sites throughout the network.
- Art on greenway trails provide the most public benefit when located on trails with the greatest expectation of exposure to trail users.
- Artists should engage the public when developing their concept to obtain the flavor and passion of the local community.
- If an artist(s) has been selected prior to planning and design services, it may be beneficial for them to engage in the project process.
- Artists should be encouraged to produce artwork in a variety of materials for sites along the corridor.
- Site furnishings and amenities may also act as art installations. Key intersections or areas where there is a distinct change in the ecology may be worth showcasing and enhancing through the inclusion of public art.
- If multiple artists are displayed throughout the network, consider how to balance the design continuity with the artists' unique vision.
- Community produced art and/or temporary installations should also be considered.





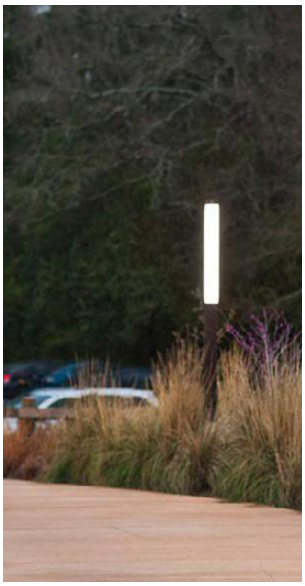


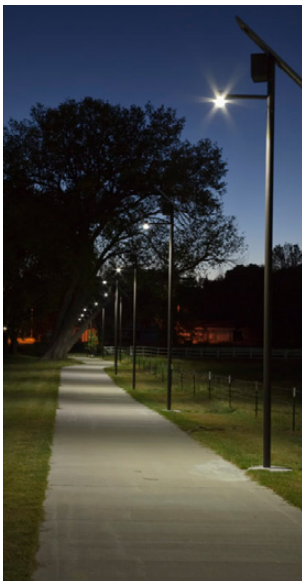


Lighting

Lighting can improve visibility and safety, both real and perceived. Lighting is especially beneficial along commuter corridors, particularly during the winter, as darkness lingers in the morning and comes early in the evening. Lighting may also be necessary in pedestrian tunnels to illuminate the passage during day-time use. Additional thoughts to consider are listed below.

- Lighting is best used at the following locations:
  - Trailheads and parking areas
  - Restroom facilities
  - Major trail intersections to assist with navigating through the network
  - Bridge entrances and exits and in pedestrian tunnels
  - Pedestrian street crossings
- Light emitting diodes (LED) are low cost fixtures offering a range of styles, light levels, optics, and colors. Using LED fixtures for new installations and retrofitting existing fixtures to accept LED lamps can reduce long term utility costs.
- Solar powered fixtures are an option where the connection to the electrical utility line would be difficult or cost prohibitive, or where using an alternate energy source is preferred.
- Trail lighting should be pedestrian scale and the lighting design for each corridor where illumination is desired should be analyzed to determine appropriate light levels for that specific location.
- Light fixtures placed at eye level could impair one's vision. Avoid eye level installations.
- Direct glare or illumination beyond the greenway property or easement onto adjacent properties, streets, or sidewalks is not permitted. Fixtures can be provided with full cut-off/shielding and luminaires can be designed with specific optics to direct light only where needed.









Landscape

Landscape is often used to aesthetically enhance, screen, or define spaces along a greenway. Landscape can also improve degraded riparian corridors, providing bank stabilization and shade for waterways to boost water quality and improve stream habitats. Other uses and considerations regarding landscape can be found below.

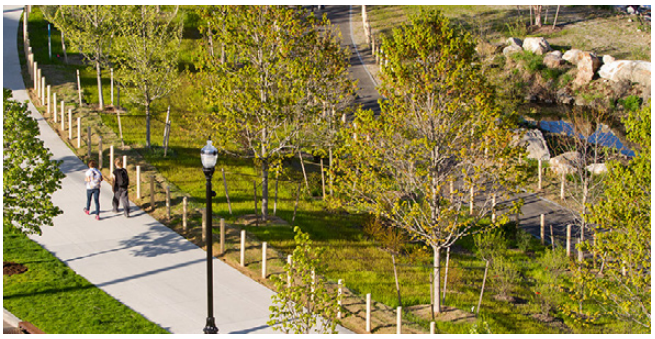
- Plant material shall be suitable for site specific conditions and either native or adaptive species that thrive in our region.
- Plant material should be low maintenance and support the character of the greenway.
- Plant material scale/size shall range from groundcover to large canopy trees based on their location and purpose and shall meet sight clearance requirements as required.
- Use landscape to define and enhance edge conditions with adjacent developments, neighborhoods, and open spaces.
- Remove invasive species when developing a new greenway corridor and institute an invasive species management program to eradicate and control invasives along established greenways and riparian corridors.
- Preserve existing vegetation where possible to emphasize the conservation of natural habitat.
- Use landscape to frame stunning and/or culturally significant views.











11. BRANDING + WAYFINDING

Concord's Parks and Recreation Department has an amazing brand that includes consistent, monumental sign standards and a whimsical greenway icon that brings attention to and guides users through the greenway system. When bolstering the signage and wayfinding amenities throughout the system, the existing design should be followed to remain true to the aesthetic and clarity of the system.

Additional elements of the signage and wayfinding system should also be incorporated into the greenway network. Trailhead markers help trail users and drivers on adjacent roadways identify trail locations, making navigation through the network safer. Other safety signs should be designed and located per MUTCD regulations. A cohesive signage standard contributes to the safety and ease of which a new (or even experienced) user navigates through the network.

A successful signage network will provide a sense of identity and utility for the greenway trail network. The program adheres to a consistent, selective, and strategic manner so as not to clutter or dominate the visual character of the greenway trails. Signage types throughout the network may include directional, regulatory, etiquette, interpretive, and informational. More information about for each sign type is included in this section with guidelines and suggestions to consider.

Destination / Directional Signs

Wayfinding is the ability to navigate through your surroundings, using visual cues like signage, landmarks, or natural features. Within a bicycle and pedestrian network, wayfinding or directional signage is typically situated at locations that lead to greenway access, along greenway trail routes, and at the intersection of multiple trails. Signs throughout the network should communicate direction of travel options, location of popular destinations, and location of access points where users can enter or exit the network. Wayfinding signs also visually signal motorists that they are traveling near a greenway trail corridor and should proceed with caution.

Directional signage increase users' comfort level with the trail network, providing them with an increased level of safety and security as they successfully navigate the system. Wayfinding signage can serve many additional functions as well; functions such as:

- Encouraging new patrons to use the greenway trail system by identifying access points
- Helping users determine the best route to desired destinations.
- Assisting emergency responders and patrons by identifying locations, in case of emergency on the trails.









Regulatory / Safety Signs

Regulatory signs indicate rules or laws that must be obeyed and typically apply to intersection control (e.g. stop or yield), speed, vehicular circulation pattern, and parking. Other signs may simply call out hazardous conditions, like slippery when wet or tight turning radius, both of which showcase conditions where caution should be used to maintain user safety.



Figure 17 – MUTCD- Regulatory Signs and Plaques for Bicycle Facilites

Etiquette Signage

Etiquette signs inform trail users of desirable or acceptable behavior along the trail system. Such guidance is a common when multiple user types are anticipated within the same corridor. For example, yielding the right-of-way to pedestrians may be considered a courtesy, but is a necessary component of a safe trail experience. Trail etiquette messages must be easily understood and should be posted at access points and regularly along the trail.



Interpretive Signage

Interpretive signage displays information about the surrounding context; notable environmental, wildlife, and vegetative features or the significance of historical or cultural elements. Interpretive displays may be combined with public art or have interactive, technological components, and typically are geared to provide educational opportunities to users. The character of each greenway and surrounding environment must be considered when designing these signs. Other considerations include:

- Working with experts in the field within which you are developing information for each sign such as historians, ecologists, or horticulturists.
- Separating interpretive signage from the main circulation path so that patrons can stop to engage without impeding regular greenway traffic, ideally at rest or gathering areas.
- Signage panels must be ADA accessible so that they can be enjoyed universally by all users.





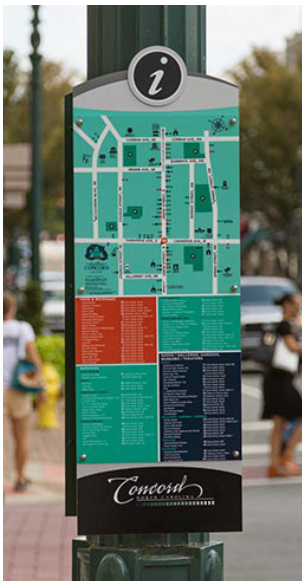


Information Kiosks

Information Kiosks relay pertinent information to patrons so that they may orient themselves within the trail network, familiarize themselves with rules and regulations of the greenway system, identify potential areas of interest, and be notified of upcoming program opportunities. When providing information kiosks, Concord should consider:

- Installing kiosks at each trailhead, designed using ADA access guidelines as applicable.
- Setting kiosks away from traffic when locating adjacent to parking facilities and incorporating appropriate barriers to protect the structure.
- Posting at a minimum, a map of the full bike/pedestrian network and rules and regulations at each kiosk.
- Evaluating the incorporation of modern technology in the kiosk design to assist in the communication of up-to-date greenway information and messages.







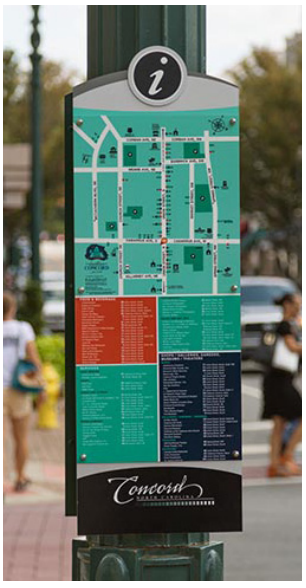


Pavement Markings

Pavement markings are typically used to reinforce posted greenway signage. However, pavement markings should not replace signage. While center line striping is the most common type, warning, regulatory, and directional markings may be incorporated. To direct as much attention as possible to these pavement marking notices, they should be used sparingly. Other guidelines are listed below.

- White or yellow high visibility thermoplastic material is the most durable and visible.
- Safety pavement markings to consider include “Stop,” “Yield,” and “Slow” or road name identification at road crossings.
- Pavement messages should be placed at access points, near intersections with other trails, or prior to roadway intersections and bridges.
- When centerline striping is utilized, use a yellow, 4-inch dashed centerline stripe and a white, 4-inch solid line at trail edges. Solid centerlines should be used at tight or blind corners and on the approaches to road crossings.
- Always use non-slip or nonskid pavement marking materials.





12. PERMITTING

Building any greenway trail will require obtaining construction permits. Depending on the location and amenities proposed, obtaining permits will require coordination with various agencies at the local, state and/or federal levels. Potential required permits for greenway trail construction may include:

- City of Concord Zoning Clearance/Stormwater Installation /Grading Permit
- Cabarrus County Building Permit (for structures)
- North Carolina Department of Transportation Encroachment Permit
- Other public agency encroachment agreements / permits may be required as well
- North Carolina Department of Environmental Quality Erosion and Sediment Control Certificate of Approval
- FEMA Conditional Letter of Map Revision (CLOMR)/FEMA Letter of Map Revision (LOMR)
- U.S. Army Corps of Engineers Section 401/404 Permit, Pre-Construction Notification (PCN) Permit

13. CONSTRUCTION ADMINISTRATION

Each construction project must have a certain level of construction administration and inspection services to ensure that the project is being delivered per the approved drawings and specifications. The City may opt to perform construction administration services, utilize the design team to carry out these services, or they can employ a third party. Regardless, the decision should be made up front regarding the preferred direction. It should be noted that if federal or state money is being used as part of the construction budget for a facility, construction administration is required to be performed by an outside, third party. Federal and State projects also require Construction, Engineering, and Inspection (CEI) services be performed by a third-party firm.

Maintenance Considerations

Greenway trail maintenance should be discussed at the feasibility stage of each project to determine the type, interval, and cost of annual trail maintenance. Design consultants should also reduce the maintenance burden through appropriate design decisions. Often there is a tradeoff between higher construction costs and lower maintenance costs and vice versa. As a benchmark, The Ohio River Greenway Development Commission has developed best practices in trail maintenance. For reference, this document is attached in the Appendix. The factors that impact maintenance include:

- Trail Surface - Fully stabilized surfaces like concrete and asphalt have very low annual maintenance requirements. Repaving of asphalt surfaces should be budgeted every 15 years.
- Materials - Likewise bridges and boardwalks with concrete decks have a lower life cycle cost than southern yellow pine decking, which must be replaced every 7-9 years. Other materials choices have lower maintenance costs including; handrails, kick boards, top rails, pickets and signage.
- Location - The location of trails also impacts the County's maintenance burden. Trails of any surface type will require higher a maintenance commitment when they are located within a floodplain that sees regular inundation of water.
- User Type – Different users impact the life of trails. Natural surface trails dedicated to walking and running require substantially less maintenance than mountain biking.

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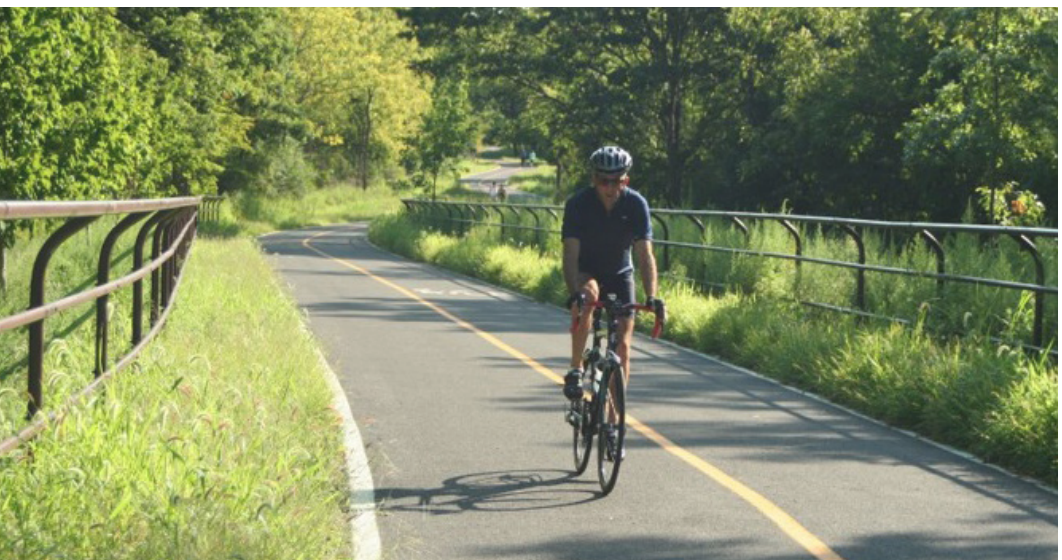
7 recommendations





CHAPTER 7 > RECOMMENDATIONS

The proposed open space connectivity network traverses through differing development densities and connects various destinations City-wide through a series of linked greenway trails, multi-use paths, and expanded bike and sidewalk facilities strategically located to connect residential neighborhoods, commercial centers, schools, transit stops, existing parks, and future recreation amenities.

The overall connectivity network is focused on meaningful connections and opportunities to provide more mobility and access to users, to improve their health and wellbeing, and to enhance economic impact and environmental protection. This plan prioritizes connectivity improvements for five, ten, and fifteen-year planning horizons by identifying corridors that consider:

- Minimal land / easement acquisition
- Strong support from the community
- The ability to improve access to priority destinations, especially public parks and schools
- Potential for acquisition of land in danger of more immediate development
- Proximity to population growth centers
- Connection to or traversing across isolated, low-income areas
- Facilitation of regional connections

METHODOLOGY

The Design Team's mythology to arrive at the recommendations contained herein included data collection through desktop map analysis, on-site field visits, and public input. Existing bicycling and pedestrian facilities (e.g. sidewalks, bike lanes, multi-use paths, and greenways) and proposed facilities from previous planning efforts were mapped to determine where gaps currently exist and to identify which previously planned corridors have yet to be integrated into Concord's transportation system. This exercise also helped inform the design team about which corridors have been the subject of previous focus and planning efforts and are therefore significant to advancement of the network.

Not only does Concord desire to be a connected community internally, but they want to provide opportunities to link to and become a significant contributor to a regional trail system. The design team explored possible connections to planned or existing trails in the surrounding jurisdictions of Kannapolis, Harrisburg, Cabarrus County, and Charlotte/Mecklenburg County and incorporated connections where feasible.

From these key steps, recommendations were developed in concert with Concord Staff, across City departments, and with the needs and desires of Concord residents at the forefront.

THE CITYWIDE OPEN SPACE CONNECTIVITY NETWORK

The Concord open space connectivity network intends to:

- Provide easily accessible connections to destinations.
- Provide facilities that safely accommodate multiple user types, abilities, and ages.
- Provide access to the greenway trail system from the street network.

In the following Network Recommendations section, the open space connectivity network will be presented through maps at various scales and levels of detail. These include:

- The Overall Network
- Small Plan Study Areas
- Detailed Greenway Corridor Studies

NETWORK RECOMMENDATIONS

THE OVERALL NETWORK

The largest scale of analysis is presented in a series of maps that layer existing and proposed bicycle and pedestrian facilities to build a connected network.

During the design process, it became evident that the existing greenway trails, sidewalks, and bicycle facilities are important to the City's transportation system and that the public desired to expand upon the existing network with additional bicycle/pedestrian facilities throughout the City.

To respond to this unmet need, the overall connectivity network builds upon existing facilities with proposed greenway corridors, multi-use path corridors, and sidewalks as well as identifying prominent intersections in need of improvement to accommodate bicycle and pedestrian movement.

Proposed Greenway Corridors

The network plan recommends greenways along Rocky River, Coddle Creek, Irish Buffalo Creek, Three Mile Branch Creek, and Academy Branch as previously identified in the City's planned greenway system. In addition, greenway corridors are recommended along Clarke Creek, Stricker Branch, Cold Water Creek, Reedy Creek, Wolf Meadow Branch, tributaries of both Rocky River and Coddle Creek, the North Carolina/Bootsmead Rail Spur, and the Great Philadelphia Wagon Road.

Within the proposed greenway corridors, several were examined more closely to develop specific recommendations for segments of the Hector Henry Greenway (Rocky River), Clarke Creek Greenway, Coddle Creek Greenway, and Irish Buffalo Greek Greenway. Recommendations from that analysis can be found within this section under "Detailed Greenway Corridor Studies."

Proposed Multi-Use Path Corridors

Given the significant overland mileage to connect people to destinations east to west through the City, it is recommended that Concord coordinate closely with the North Carolina Department of Transportation (NCDOT) to implement multi-use paths and/or greenway segments along state highways. For example, Concord has requested a multi-use path on the south side of Poplar Tent as part of NCDOT's widening project - STIP Project #U-3415A.

On the following maps, it should be noted that the multi-use corridor lines that are located on a specific side of a road (like Poplar Tent Road) denotes a specific recommendation or predetermined location. If the multi-use corridor line is located along the centerline of the road, a specific location(s) shall be determined upon more detailed analysis of the corridor during subsequent phases of corridor and feasibility studies. The City must evaluate these corridors on a case-by-case basis to determine the appropriate treatment based on citizen input, road type/speed limit, number of travel lanes,

volume of vehicular traffic, etc. Multi-use paths are recommended along:

- Davidson Highway (NC-73) widening – STIP Project #R-5706B
  - Requested multi-use paths - both north and south side
- Poplar Tent widening from Woodhaven Place/ Gable Oaks Lane roundabout to George Liles Parkway – STIP Project #U-3415A
  - Requested multi-use path - south side
- Union Cemetery Road Realignment with Rock Hill Church Road – STIP #U-5956
  - Requested sidewalks and bike lanes on both east and west side
- Derita Road widening – STIP #U-4910
  - Requested sidewalks and bike lanes on both east and west side
- George Liles Extension future widening from Concord Parkway (NC-29) to NC-49
  - from Roberta Rd south to NC-49 – STIP Project number to be assigned when the TIP is adopted in Summer, 2019
  - Requested multi-use paths - both north and south side

It is recommended that Concord utilize multi-use paths in lieu of sidewalks + on-road bicycle facilities where feasible, as multi-use paths attract the widest range of users, appealing to the "8 to 80" demographic.

Proposed Sidewalk and Bicycle Enhancements

However, due to limited ROW within Historic Downtown and other densely developed areas, it is recommended to widen and/or repair sidewalks where necessary and feasible, filling in the gaps between existing facilities. Where existing conditions permit, accommodate on-street bike facilities like buffered bike lanes, cycle tracks, conventional bike lanes, or shared bike lanes ("sharrows").

Funded Projects

You will also notice in the following maps, identification of several corridors that are funded. These projects have advanced beyond the planning stage and are moving forward with design and construction. Projects that are funded include:

Greenways

- Hector Henry: Riverwalk Phase
- Hector Henry: Airport Phase (Derita Road to Weddington Road)
- McEachern: Hospital Phase (Lake Concord to Burrage Road)

NCDOT – STIP Projects

- Davidson Highway (NC-73) widening – STIP Project #R-5706B
  - Requested multi-use paths - both north and south side
- Poplar Tent widening from Woodhaven Place/ Gable Oaks Lane roundabout to George Liles Parkway – STIP Project #U-3415A
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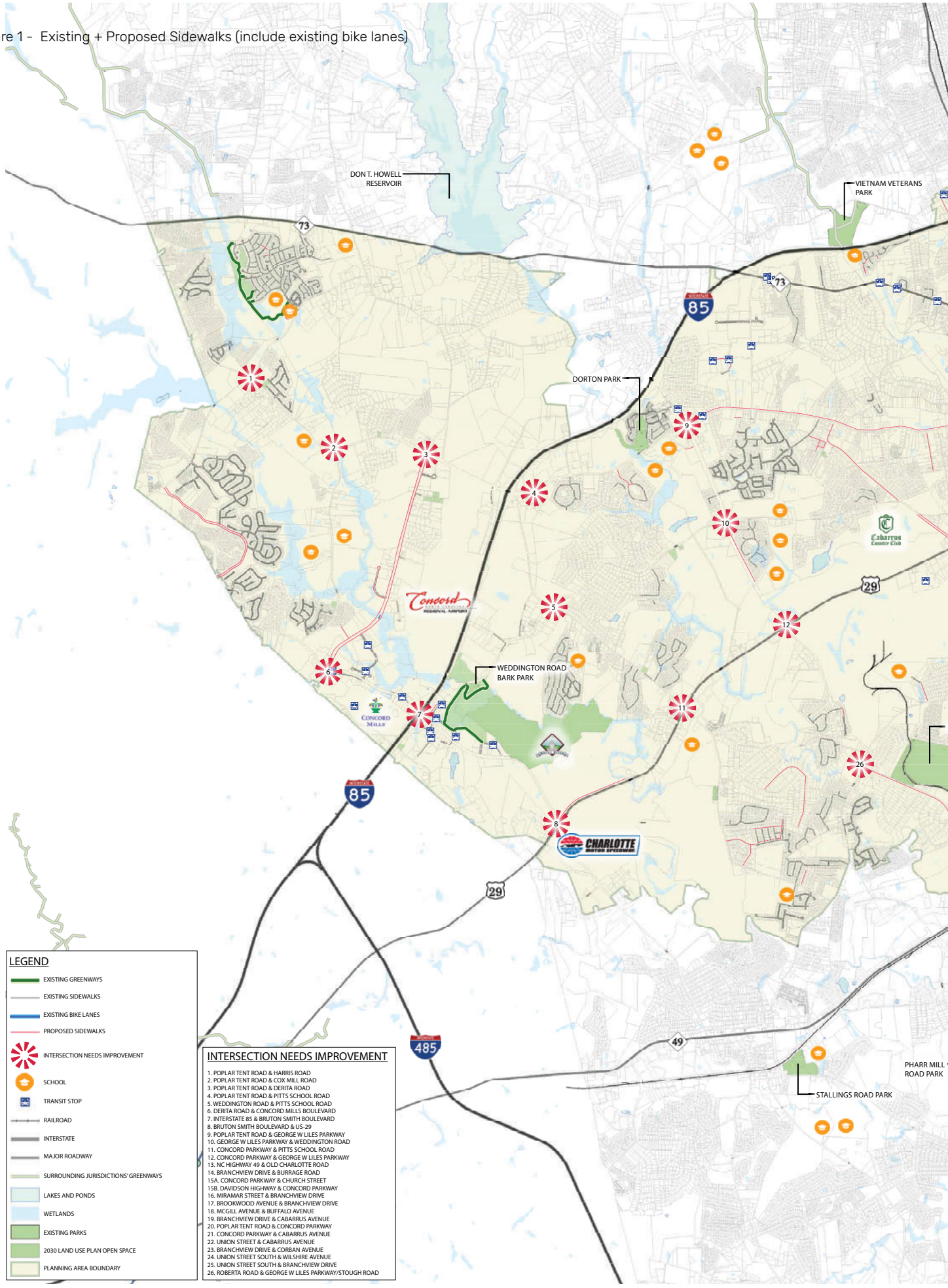
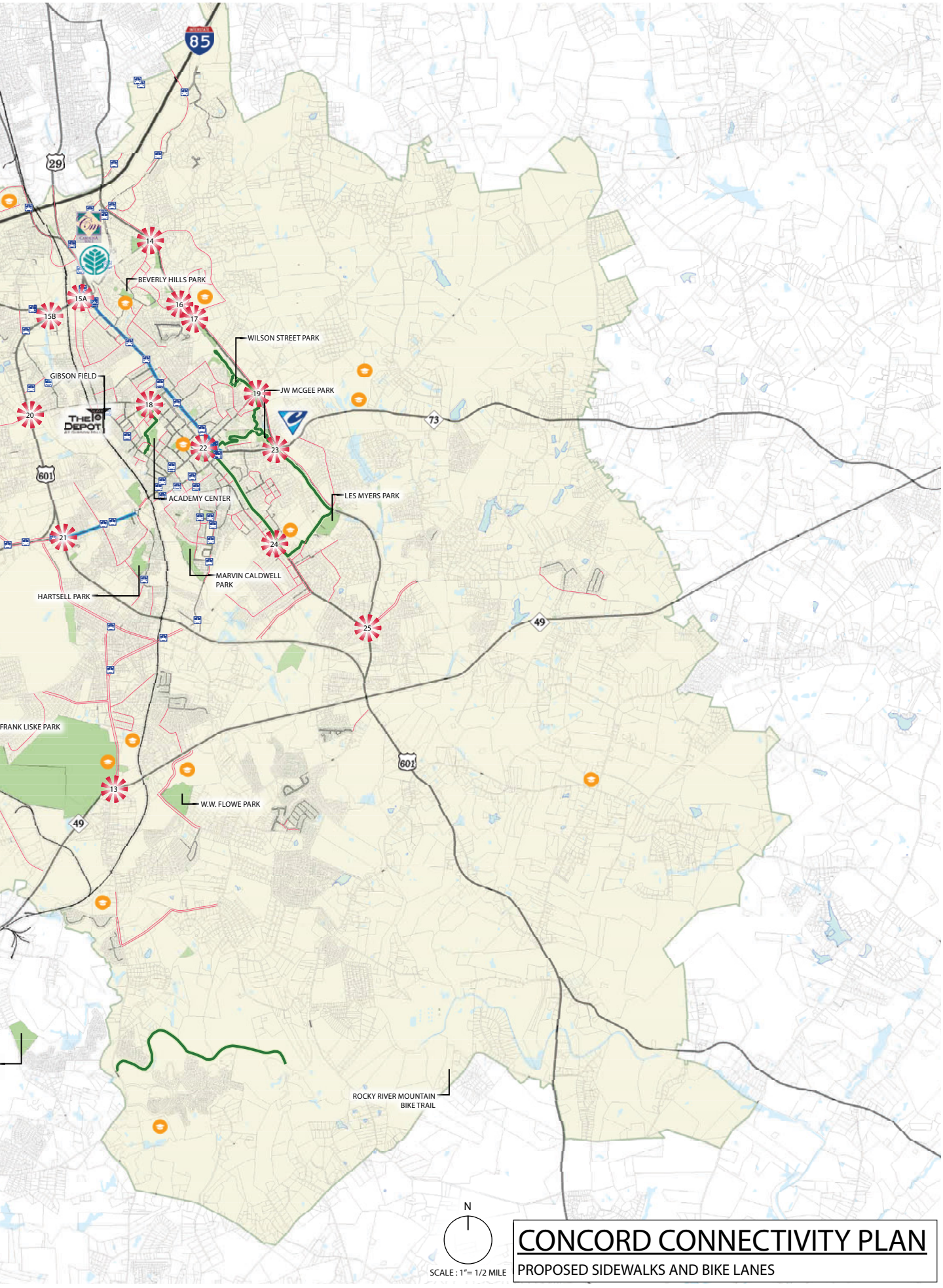
  - from Roberta Rd south to NC-49 – STIP Project number to be assigned when the TIP is adopted in Summer, 2019
  - from Roberta Rd north to Concord Parkway (NC-29) – STIP Project number to be assigned when the TIP is adopted Summer, 2019

Multi-Use Paths

- Bruton Smith Blvd from Gateway Lane to Concord Parkway (NC-29)
- Multi-Use Path on north side

Figure 1 - Existing + Proposed Sidewalks (include existing bike lanes)

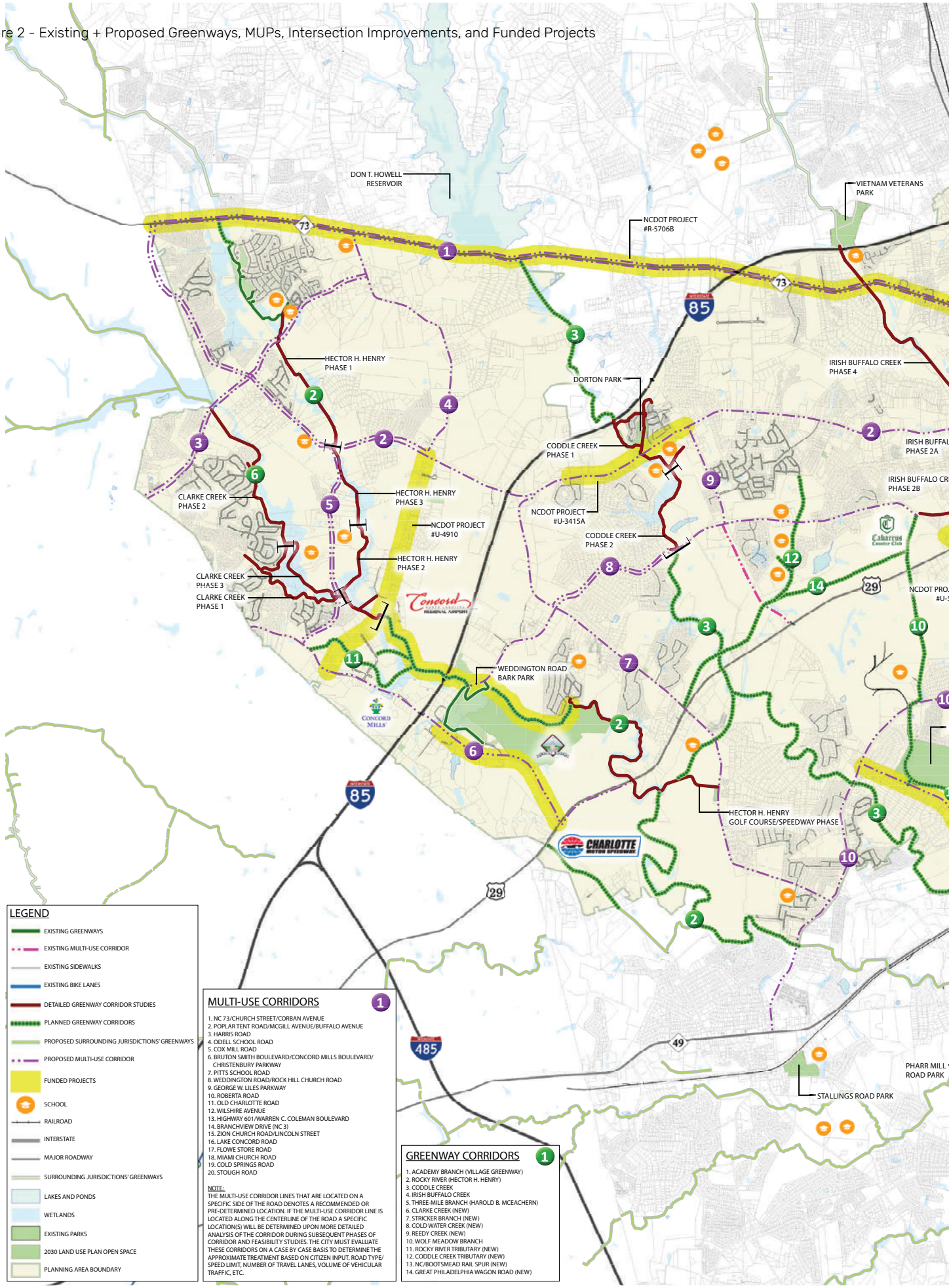


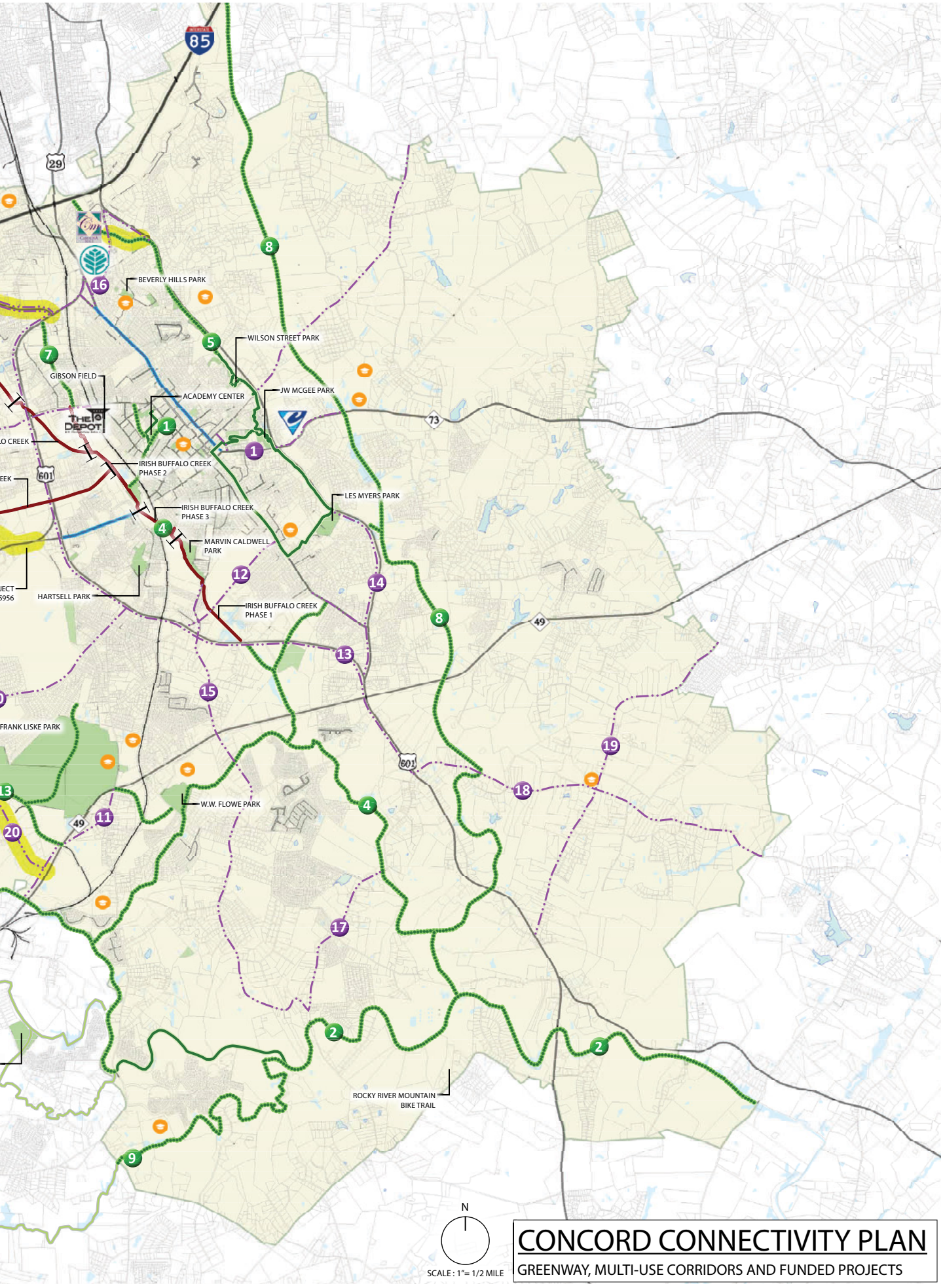


CONCORD CONNECTIVITY PLAN

PROPOSED SIDEWALKS AND BIKE LANES

Figure 2 - Existing + Proposed Greenways, MUPs, Intersection Improvements, and Funded Projects

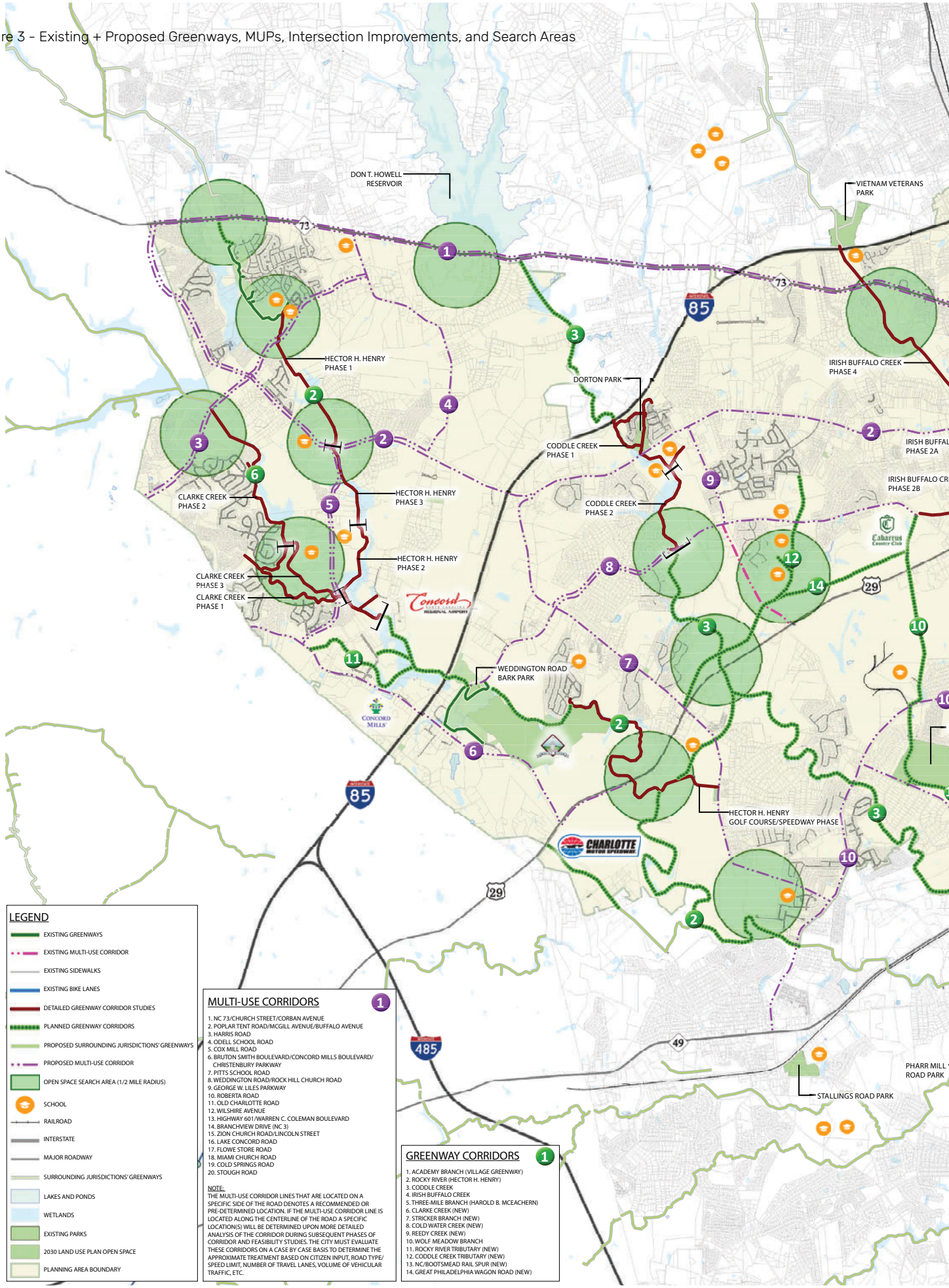




CONCORD CONNECTIVITY PLAN

GREENWAY, MULTI-USE CORRIDORS AND FUNDED PROJECTS

Figure 3 - Existing + Proposed Greenways, MUPs, Intersection Improvements, and Search Areas



LEGEND

- EXISTING GREENWAYS
- EXISTING MULTI-USE CORRIDOR
- EXISTING SIDEWALKS
- EXISTING BIKE LANES
- DETAILED GREENWAY CORRIDOR STUDIES
- PLANNED GREENWAY CORRIDORS
- PROPOSED SURROUNDING JURISDICTIONS' GREENWAYS
- PROPOSED MULTI-USE CORRIDOR
- OPEN SPACE SEARCH AREA (1/2 MILE RADIUS)
- SCHOOL
- RAILROAD
- INTERSTATE
- MAJOR ROADWAY
- SURROUNDING JURISDICTIONS' GREENWAYS
- LAKES AND PONDS
- WETLANDS
- EXISTING PARKS
- 2030 LAND USE PLAN OPEN SPACE
- PLANNING AREA BOUNDARY

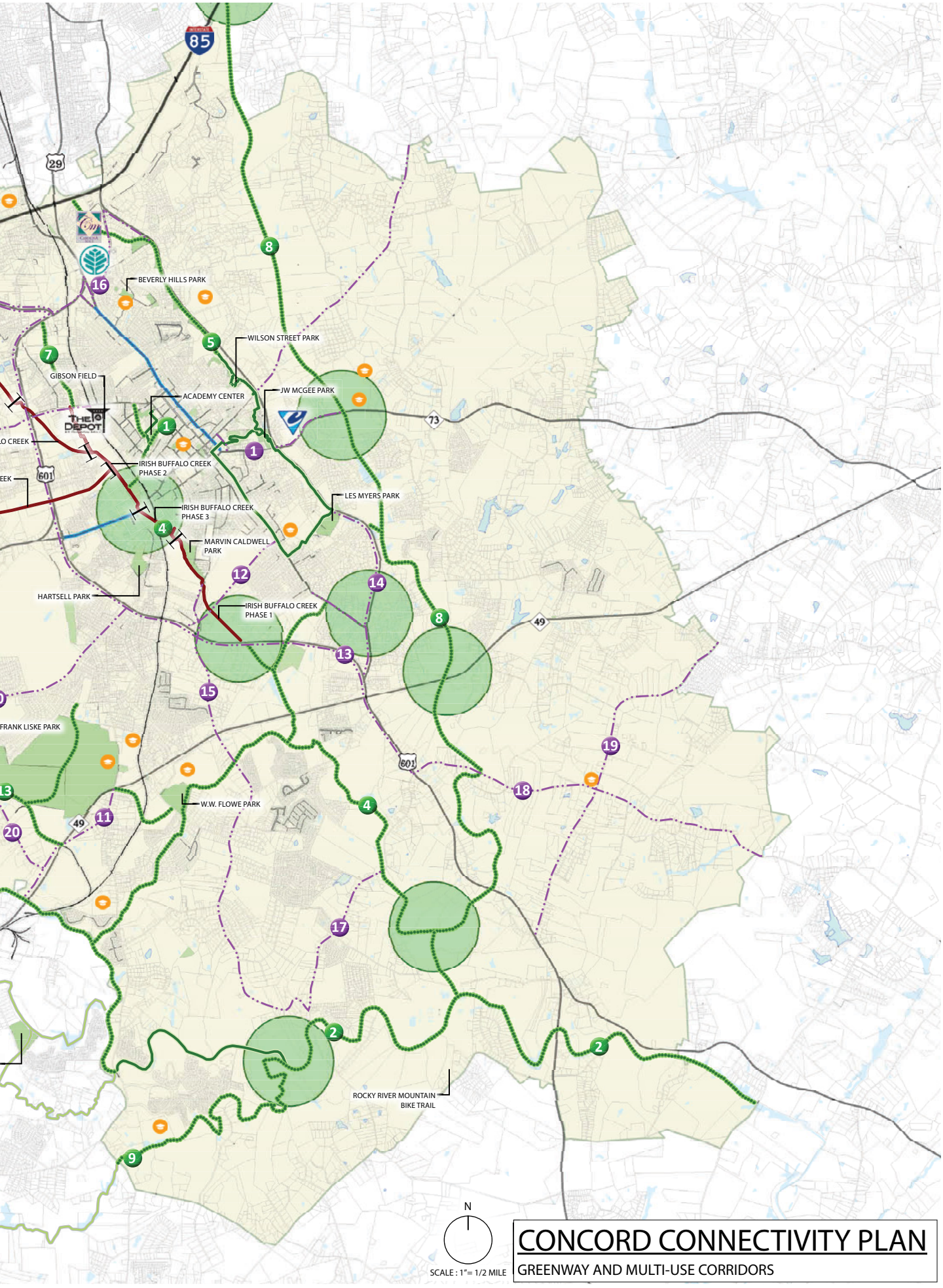
MULTI-USE CORRIDORS

1. NC 73/CHURCH STREET/CORBAN AVENUE
2. POPLAR TENT ROAD/MCGILL AVENUE/BUFFALO AVENUE
3. HARRIS ROAD
4. ODELL SCHOOL ROAD
5. COX MILL ROAD
6. BRUTON SMITH BOULEVARD/CONCORD MILLS BOULEVARD/ CHRISTENBURY PARKWAY
7. PITTS SCHOOL ROAD
8. WEDDINGTON ROAD/ROCK HILL CHURCH ROAD
9. GEORGE W. LILES PARKWAY
10. ROBERTA ROAD
11. OLD CHARLOTTE ROAD
12. WILSHIRE AVENUE
13. HIGHWAY 601/WARREN C. COLEMAN BOULEVARD
14. BRANCHVIEW DRIVE (NC 3)
15. ZION CHURCH ROAD/LINCOLN STREET
16. LAKE CONCORD ROAD
17. FLOWE STORE ROAD
18. MIAMI CHURCH ROAD
19. COLD SPRINGS ROAD
20. STOUGH ROAD

NOTE:
THE MULTI-USE CORRIDOR LINES THAT ARE LOCATED ON A SPECIFIC SIDE OF THE ROAD DENOTES A RECOMMENDED OR PRE-DETERMINED LOCATION. IF THE MULTI-USE CORRIDOR LINE IS LOCATED ALONG THE CENTERLINE OF THE ROAD A SPECIFIC LOCATION(S) WILL BE DETERMINED UPON MORE DETAILED ANALYSIS OF THE CORRIDOR DURING SUBSEQUENT PHASES OF CORRIDOR AND FEASIBILITY STUDIES. THE CITY MUST EVALUATE THESE CORRIDORS ON A CASE BY CASE BASIS TO DETERMINE THE APPROXIMATE TREATMENT BASED ON CITIZEN INPUT, ROAD TYPE/ SPEED LIMIT, NUMBER OF TRAVEL LANES, VOLUME OF VEHICULAR TRAFFIC, ETC.

GREENWAY CORRIDORS

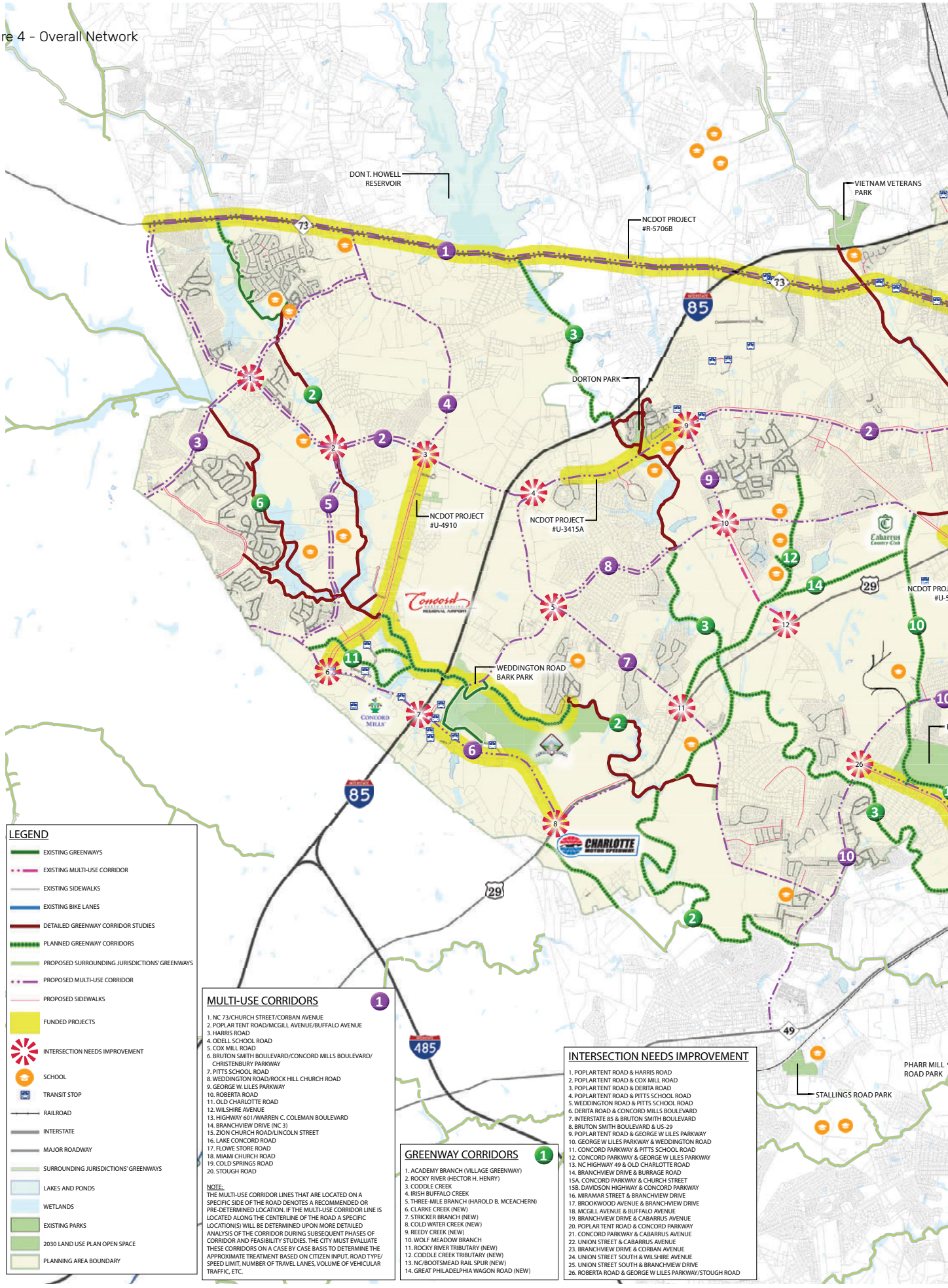
1. ACADEMY BRANCH (VILLAGE GREENWAY)
2. ROCKY RIVER (HECTOR H. HENRY)
3. CODDLE CREEK
4. IRISH BUFFALO CREEK
5. THREE-MILE BRANCH (HAROLD B. MCEACHERN)
6. CLARKE CREEK (NEW)
7. STRICKER BRANCH (NEW)
8. COLD WATER CREEK (NEW)
9. REEDY CREEK (NEW)
10. WOLF MEADOW BRANCH
11. ROCKY RIVER TRIBUTARY (NEW)
12. CODDLE CREEK TRIBUTARY (NEW)
13. NC/BOOTSMEAD RAIL SPUR (NEW)
14. GREAT PHILADELPHIA WAGON ROAD (NEW)

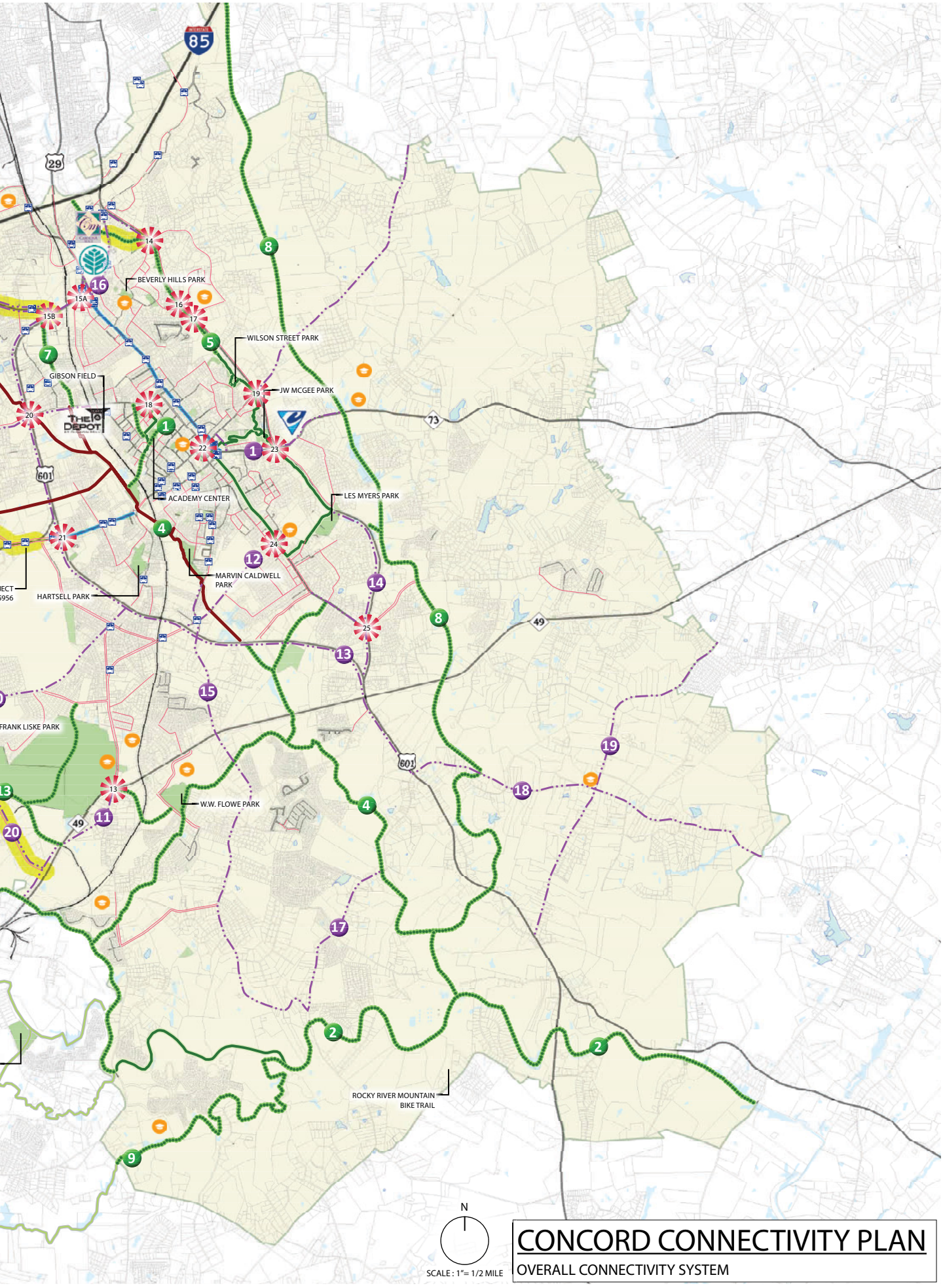


CONCORD CONNECTIVITY PLAN

GREENWAY AND MULTI-USE CORRIDORS

Figure 4 - Overall Network

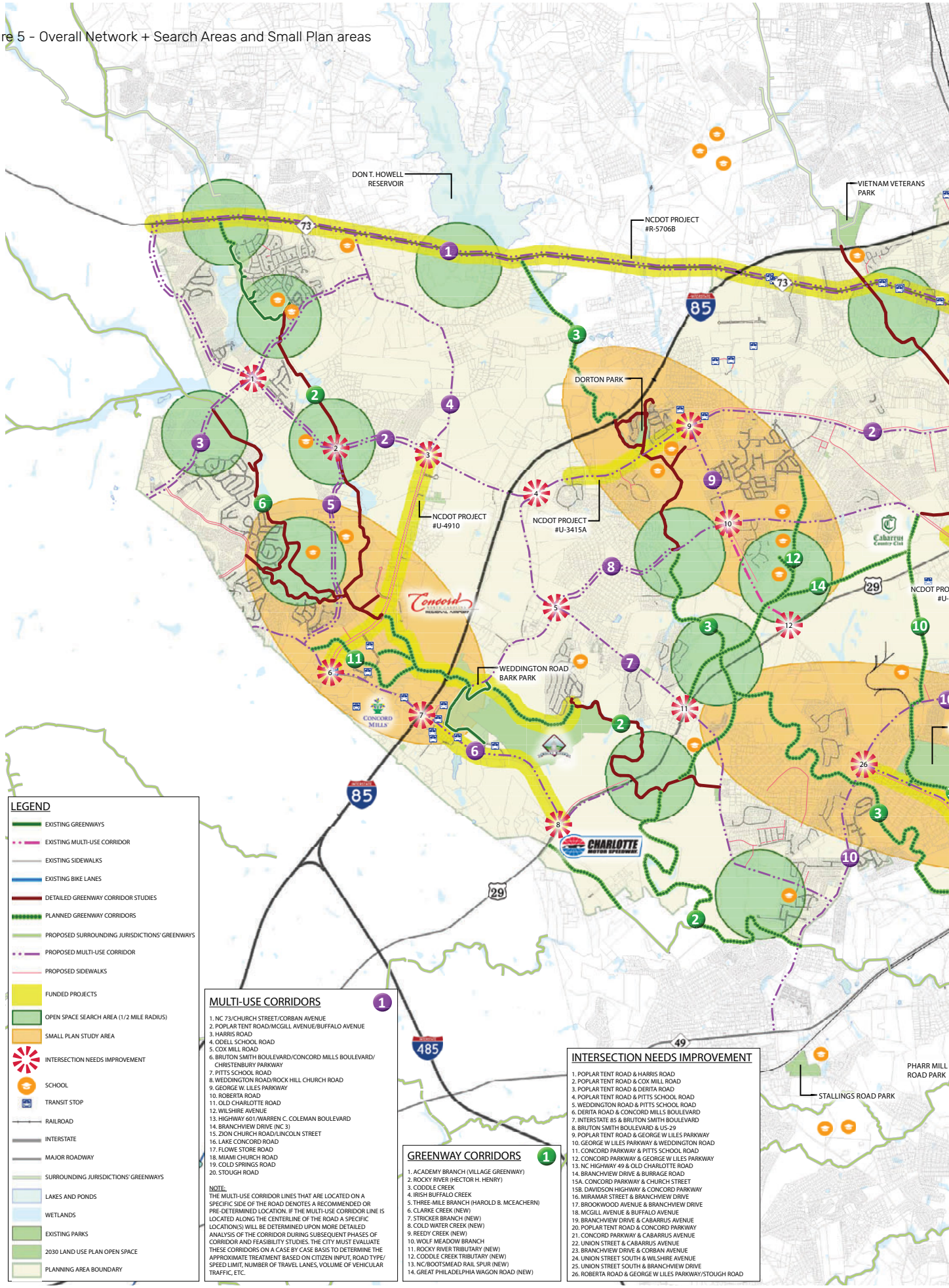




CONCORD CONNECTIVITY PLAN

OVERALL CONNECTIVITY SYSTEM

Figure 5 - Overall Network + Search Areas and Small Plan areas



LEGEND

- EXISTING GREENWAYS
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- EXISTING SIDEWALKS
- EXISTING BIKE LANES
- DETAILED GREENWAY CORRIDOR STUDIES
- PLANNED GREENWAY CORRIDORS
- PROPOSED SURROUNDING JURISDICTIONS' GREENWAYS
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALKS
- FUNDED PROJECTS
- OPEN SPACE SEARCH AREA (1/2 MILE RADIUS)
- SMALL PLAN STUDY AREA
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- SCHOOL
- TRANSIT STOP
- RAILROAD
- INTERSTATE
- MAJOR ROADWAY
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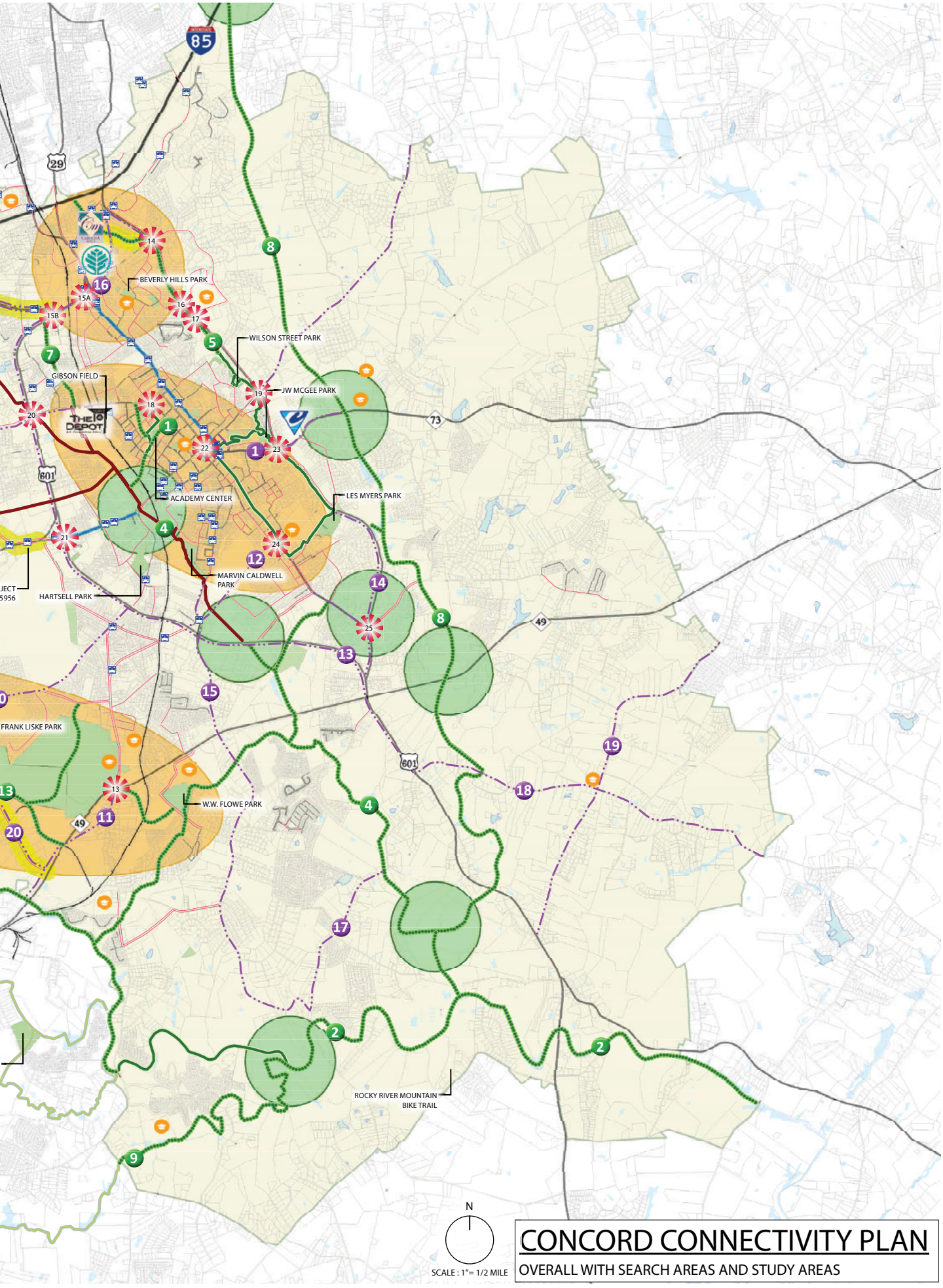
11. ROCKY RIVER TRIBUTARY (NEW)
12. CODDLE CREEK TRIBUTARY (NEW)
13. NC/BOOTSMEAD RAIL SPUR (NEW)
14. GREAT PHILADELPHIA WAGON ROAD (NEW)

INTERSECTION NEEDS IMPROVEMENT

1. POPLAR TENT ROAD & HARRIS ROAD
2. POPLAR TENT ROAD & COX MILL ROAD
3. POPLAR TENT ROAD & DERITA ROAD
4. POPLAR TENT ROAD & PITTS SCHOOL ROAD
5. WEDDINGTON ROAD & PITTS SCHOOL ROAD
6. DERITA ROAD & CONCORD MILLS BOULEVARD
7. INTERSTATE 85 & BRUTON SMITH BOULEVARD
8. BRUTON SMITH BOULEVARD & US-29
9. POPLAR TENT ROAD & GEORGE W LILES PARKWAY
10. GEORGE W LILES PARKWAY & WEDDINGTON ROAD
11. CONCORD PARKWAY & PITTS SCHOOL ROAD
12. CONCORD PARKWAY & GEORGE W LILES PARKWAY
13. NC HIGHWAY 49 & OLD CHARLOTTE ROAD
14. BRANCHVIEW DRIVE & BURRAGE ROAD
15A. CONCORD PARKWAY & CHURCH STREET
15B. DAVIDSON HIGHWAY & CONCORD PARKWAY
16. MIRAMAR STREET & BRANCHVIEW DRIVE
17. BROOKWOOD AVENUE & BRANCHVIEW DRIVE
18. MCGILL AVENUE & BUFFALO AVENUE
19. BRANCHVIEW DRIVE & CABARRUS AVENUE
20. POPLAR TENT ROAD & CONCORD PARKWAY
21. CONCORD PARKWAY & CABARRUS AVENUE
22. UNION STREET & CABARRUS AVENUE
23. BRANCHVIEW DRIVE & CORBAN AVENUE
24. UNION STREET SOUTH & WILSHIRE AVENUE
25. UNION STREET SOUTH & BRANCHVIEW DRIVE
26. ROBERTA ROAD & GEORGE W LILES PARKWAY/STOUGH ROAD



CONCORD CONNECTIVITY PLAN

OVERALL WITH SEARCH AREAS AND STUDY AREAS

SMALL PLAN STUDY AREAS

The second level of study are known as small plan study areas that explore a finer grained planning analysis of a more focused area, highlighting key destinations and activity hubs to clearly show connectivity through the system. During the process, it was determined that diving into smaller scaled planning areas would offer a greater understanding and projection of proposed connections between existing/ proposed pedestrian and bicycle facilities and to existing/proposed destinations (e.g. schools, parks, commercial centers, etc.). The small plan study areas also identify opportunities for key open spaces along trail corridors. These small plan study areas were derived from zones with the greatest concentration of desired destinations as provided by citizens and Staff during the public input process. Five areas were selected and include the following.

- Western Edge Boundary
- Central City Boundary
- South Central City Boundary
- Downtown Boundary
- Hospital Boundary

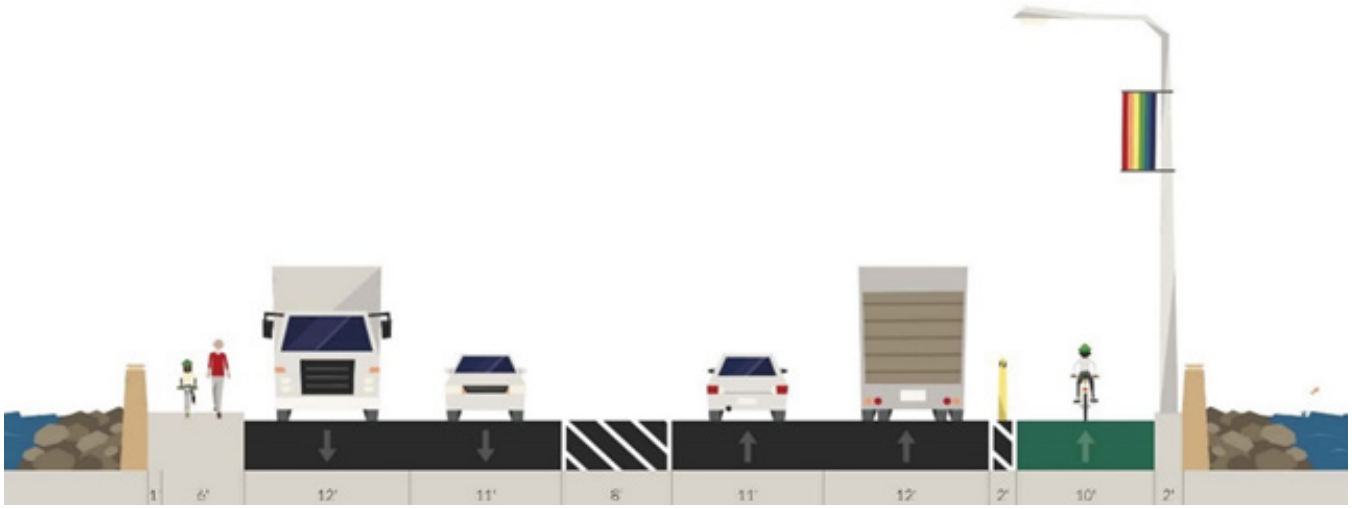


Figure 6 - Cross Section: Weddington Rd. at Hector Henry Greenway (Rocky River) Bridge (Western Edge Boundary)

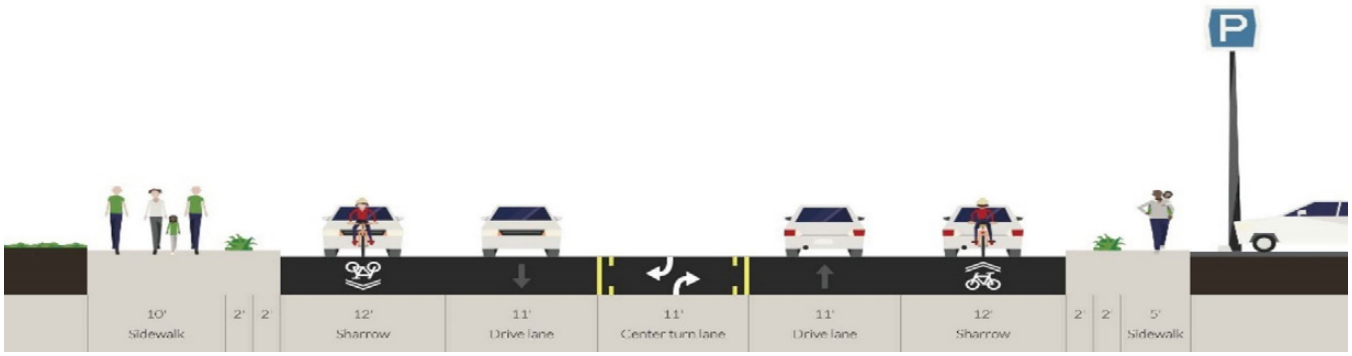


Figure 7 - Cross Section: Poplar Tent Rd. – George Liles Pkwy. to Concord Pkwy. (Central City Boundary)

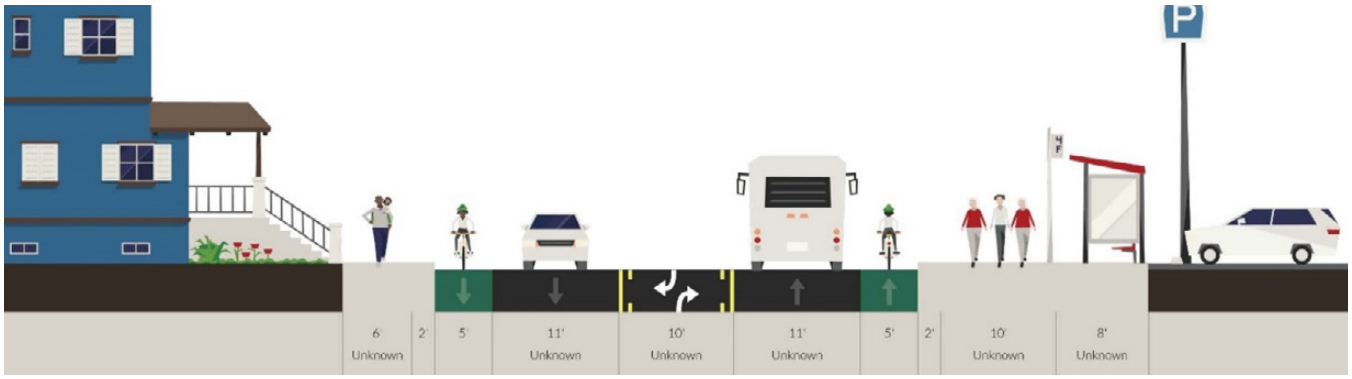


Figure 8 - Cross Section: McGill Ave. – Irish Buffalo Creek to Rail Road (Downtown Boundary)

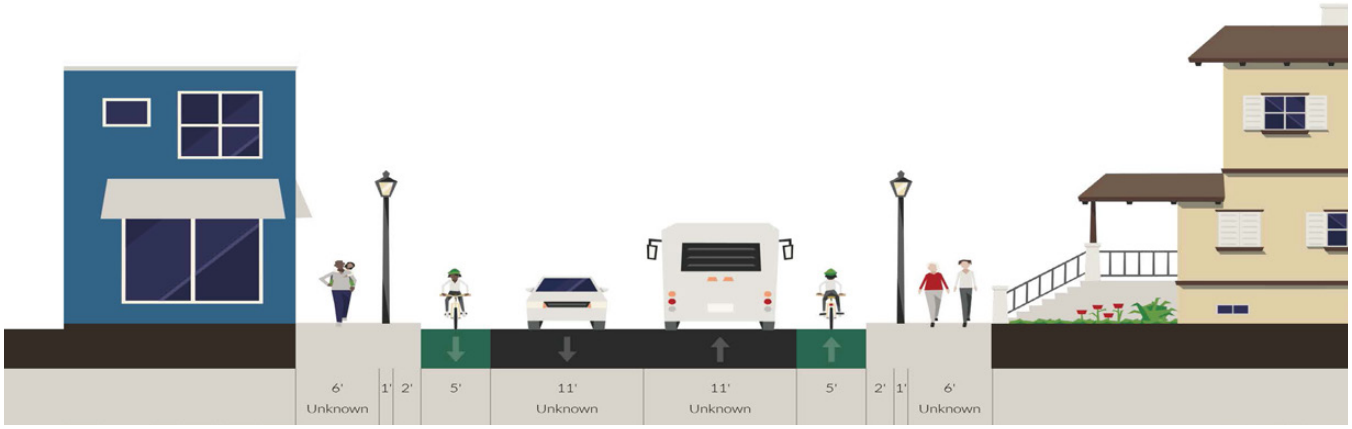


Figure 9 - Cross Section: McGill Ave. – Railroad Dr. to Kerr St. (Downtown Boundary)

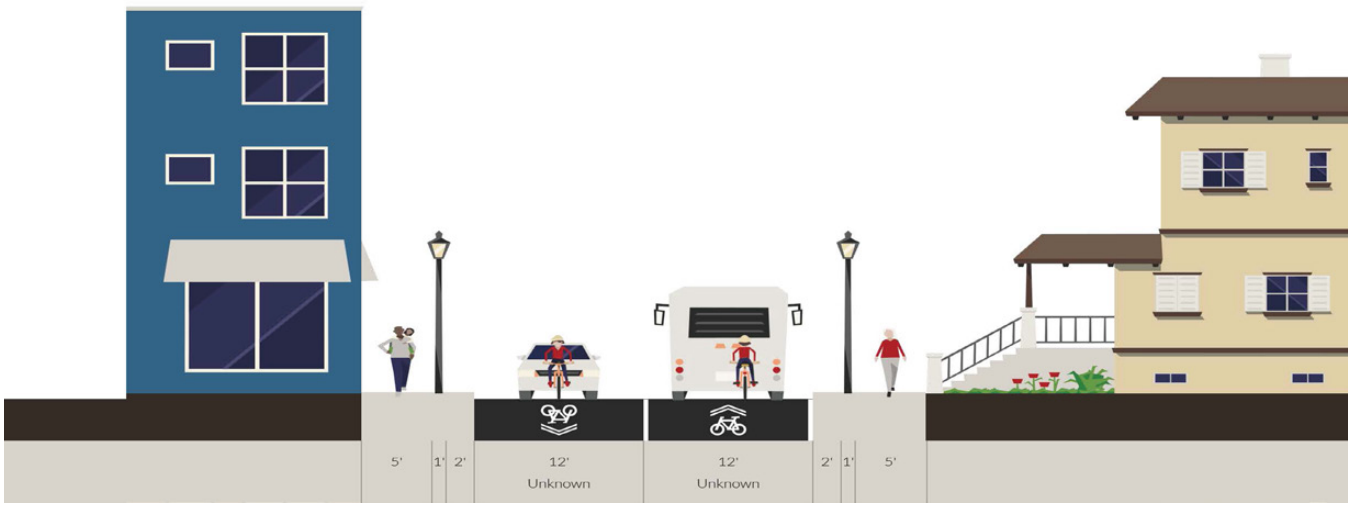


Figure 10 - Cross Section: McGill/Buffalo Ave. – Kerr St. to Church St. (Downtown Boundary)

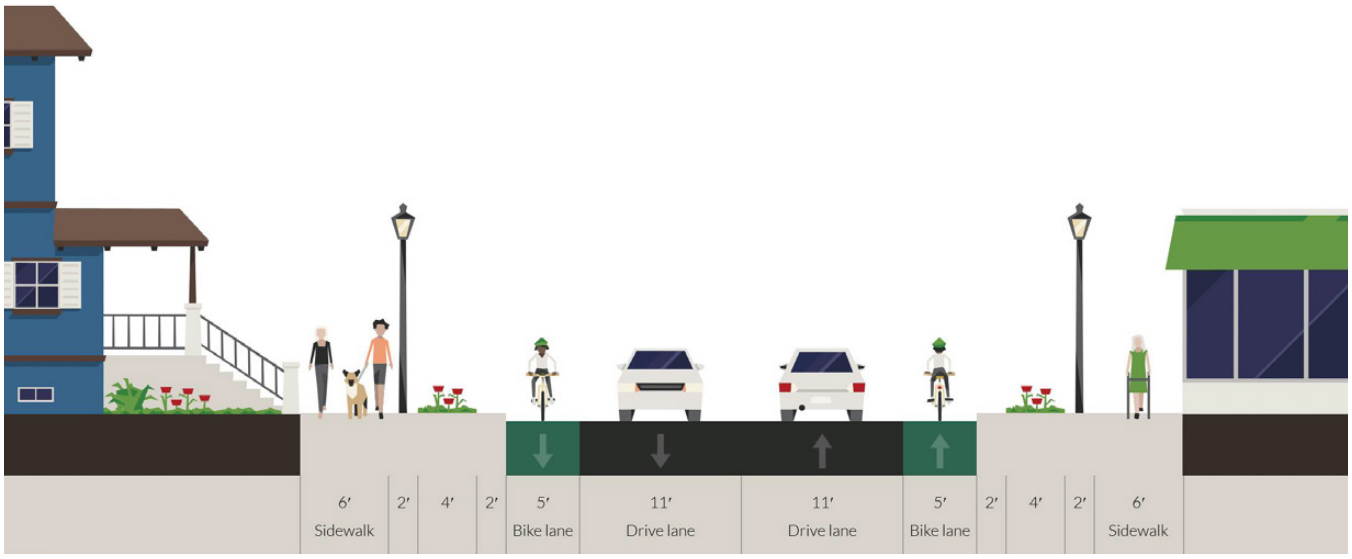


Figure 11 - Cross Section: Cabarrus Ave.
*Note: 60' Right-of-way. At major intersections where turn lanes are necessary, bikers will share the travel lane.

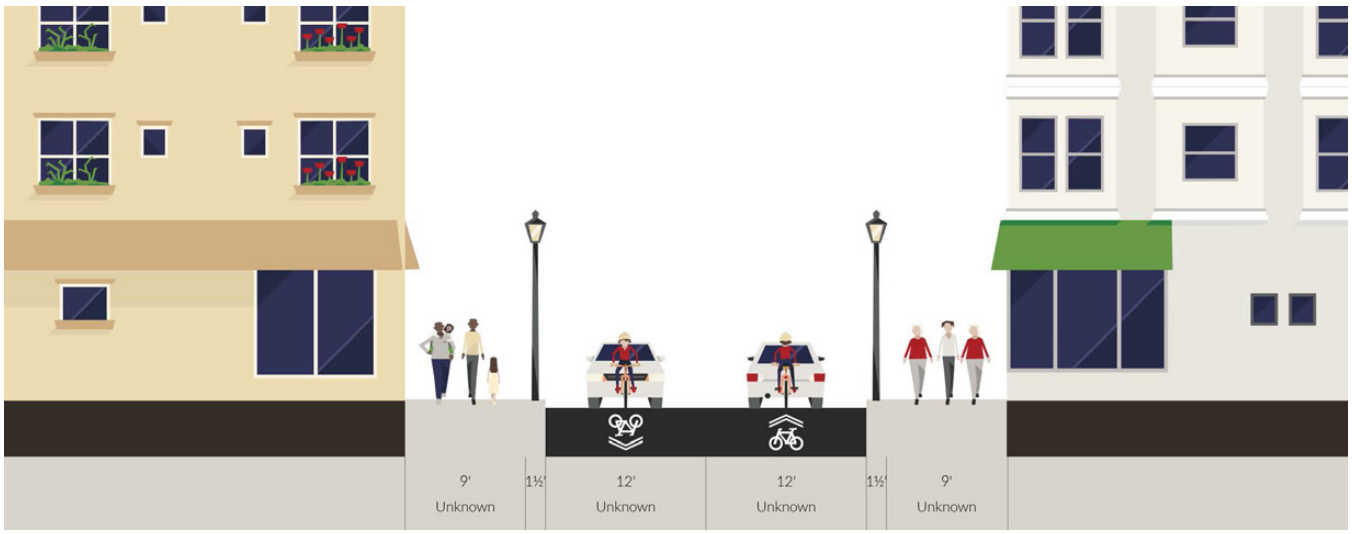


Figure 12 - Cross Section: Cabarrus Ave. – Spring St. to Church St. (Downtown Boundary)



Figure 13 - Cross Section: Kerr St. (Downtown Boundary)

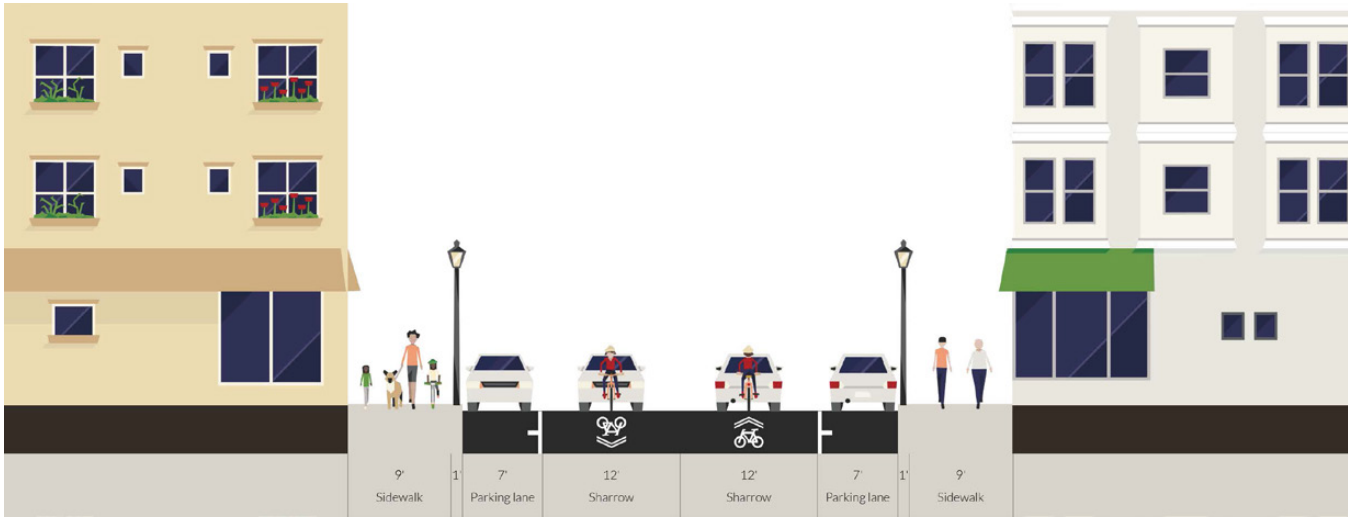


Figure 14 - Cross Section: Union St. (Downtown Boundary)

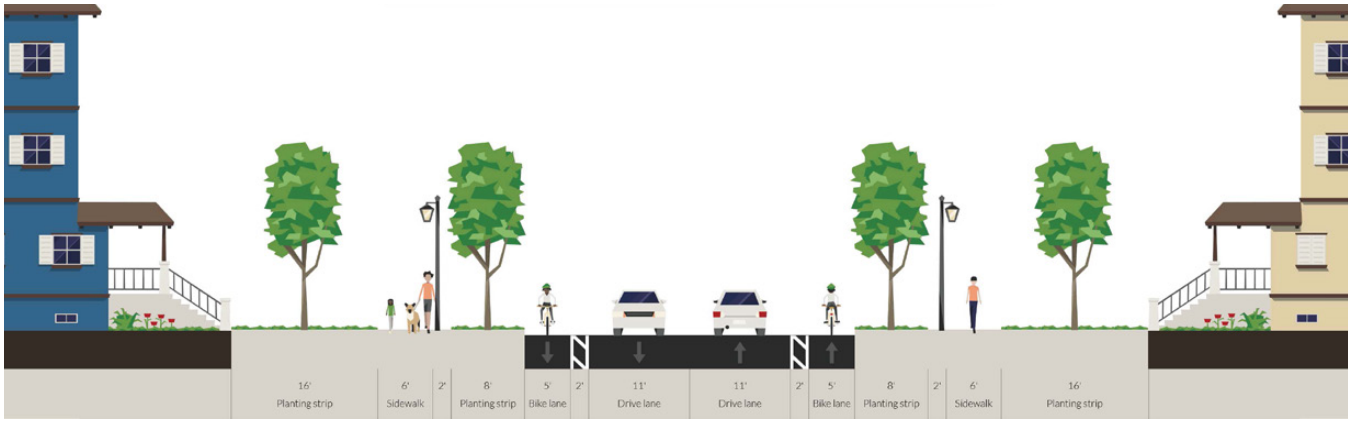


Figure 15 - Cross Section: Union Street South

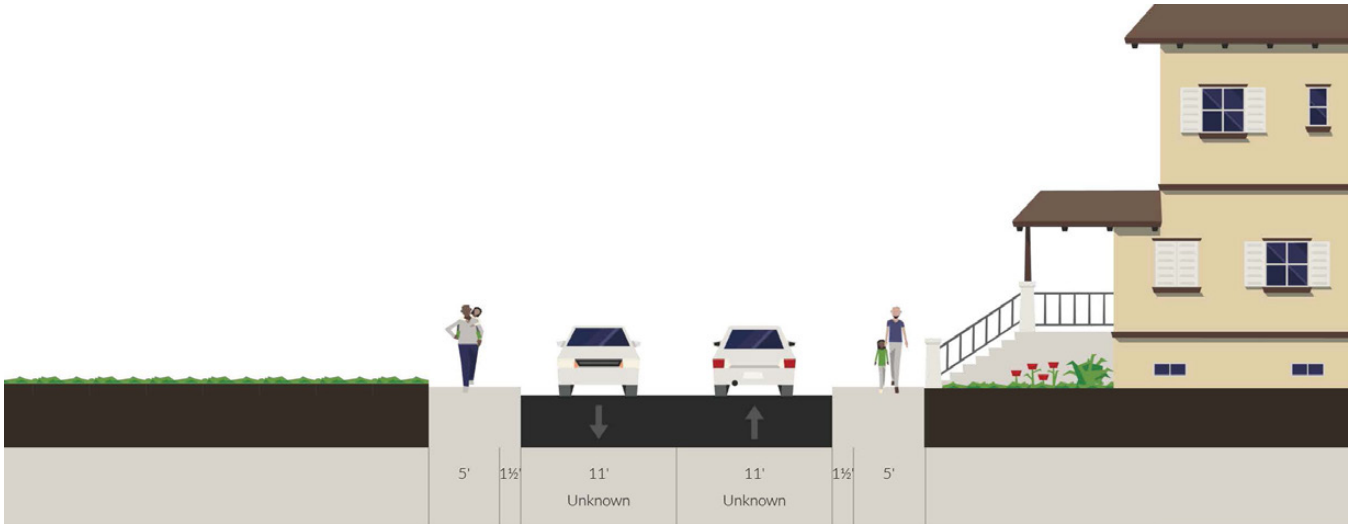


Figure 16 - Cross Section: Georgia St. – Booker Dr. to Caldwell Park (Downtown Boundary)

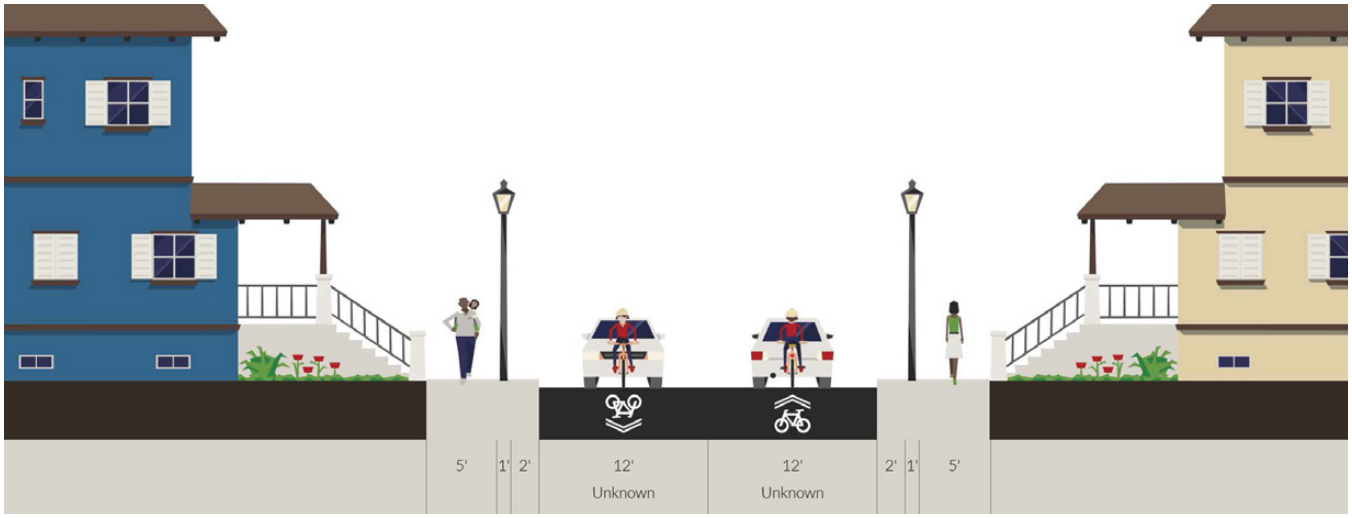


Figure 17 - Cross Section: Lincoln St. – Rone Ave. to Caldwell Park (Downtown Boundary)

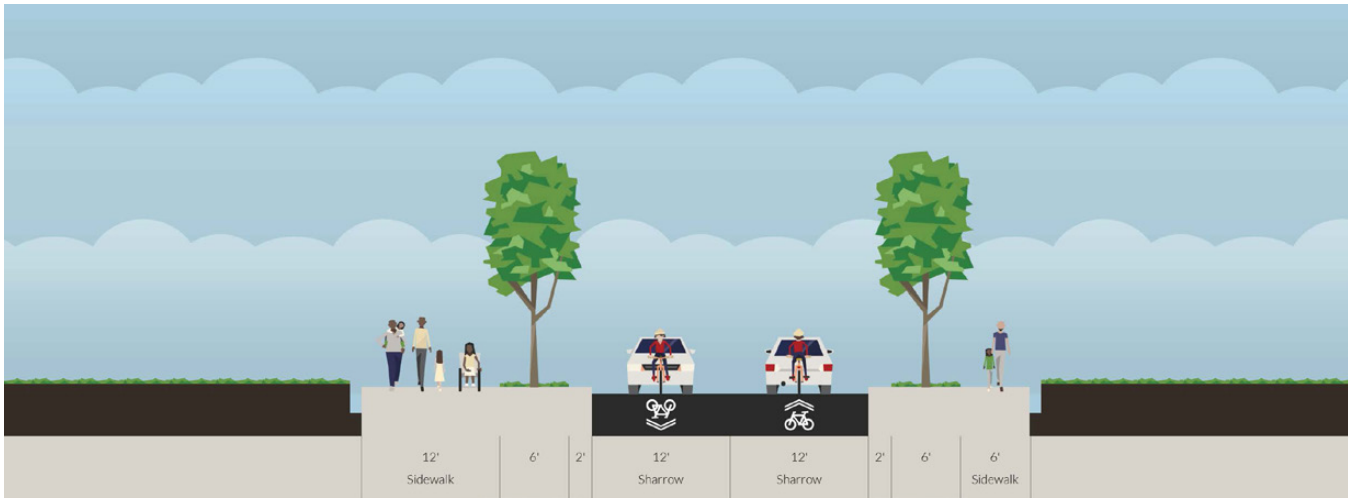


Figure 18 - Cross Section: Wilshire Ave. (Downtown Boundary)



Figure 19 - Cross Section: Branchview Dr. – Lake Concord Rd. to Bradley St. (Hospital Boundary)

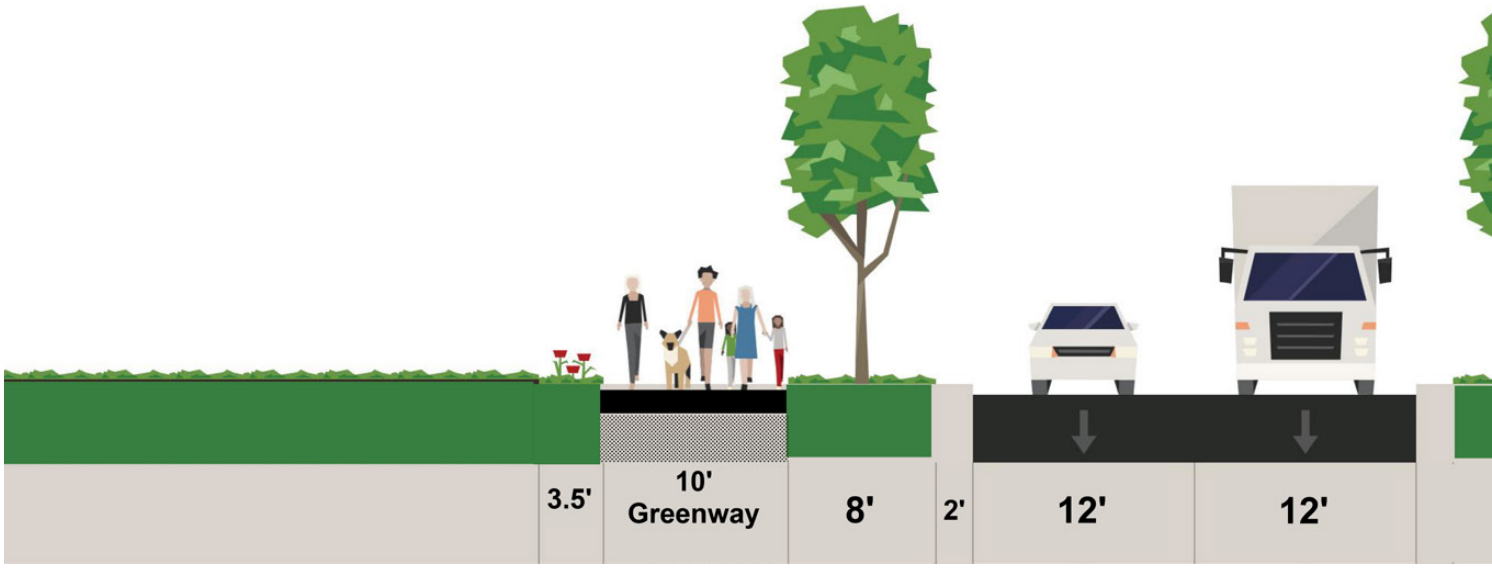
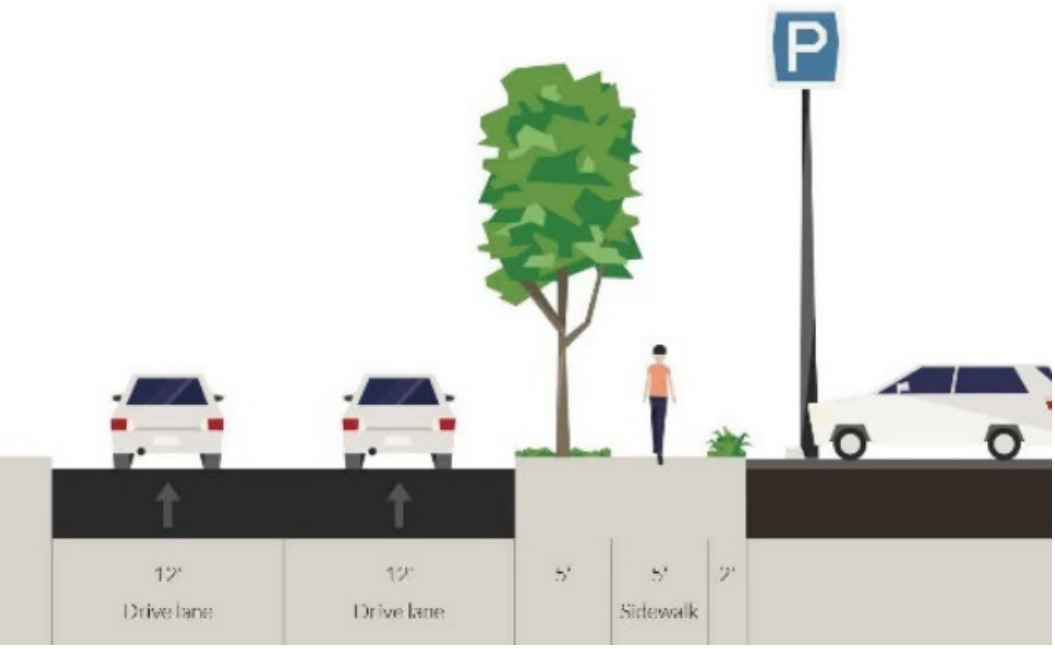


Figure 20 - Cross Section: Branchview Dr. –Lawndale Ave to Union Street
*Note: Right-of-way minimum: 110' (Modified 4-C)


P
12'
Drive lane
12'
Drive lane
5'
5'
Sidewalk
2'

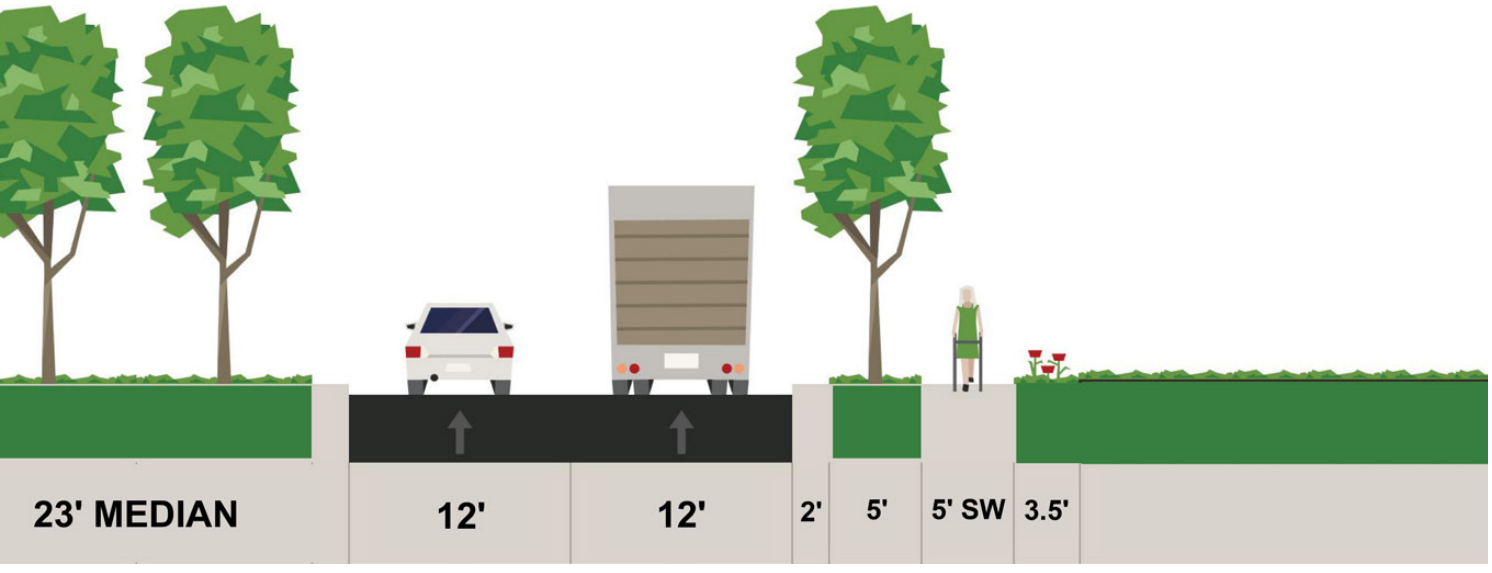
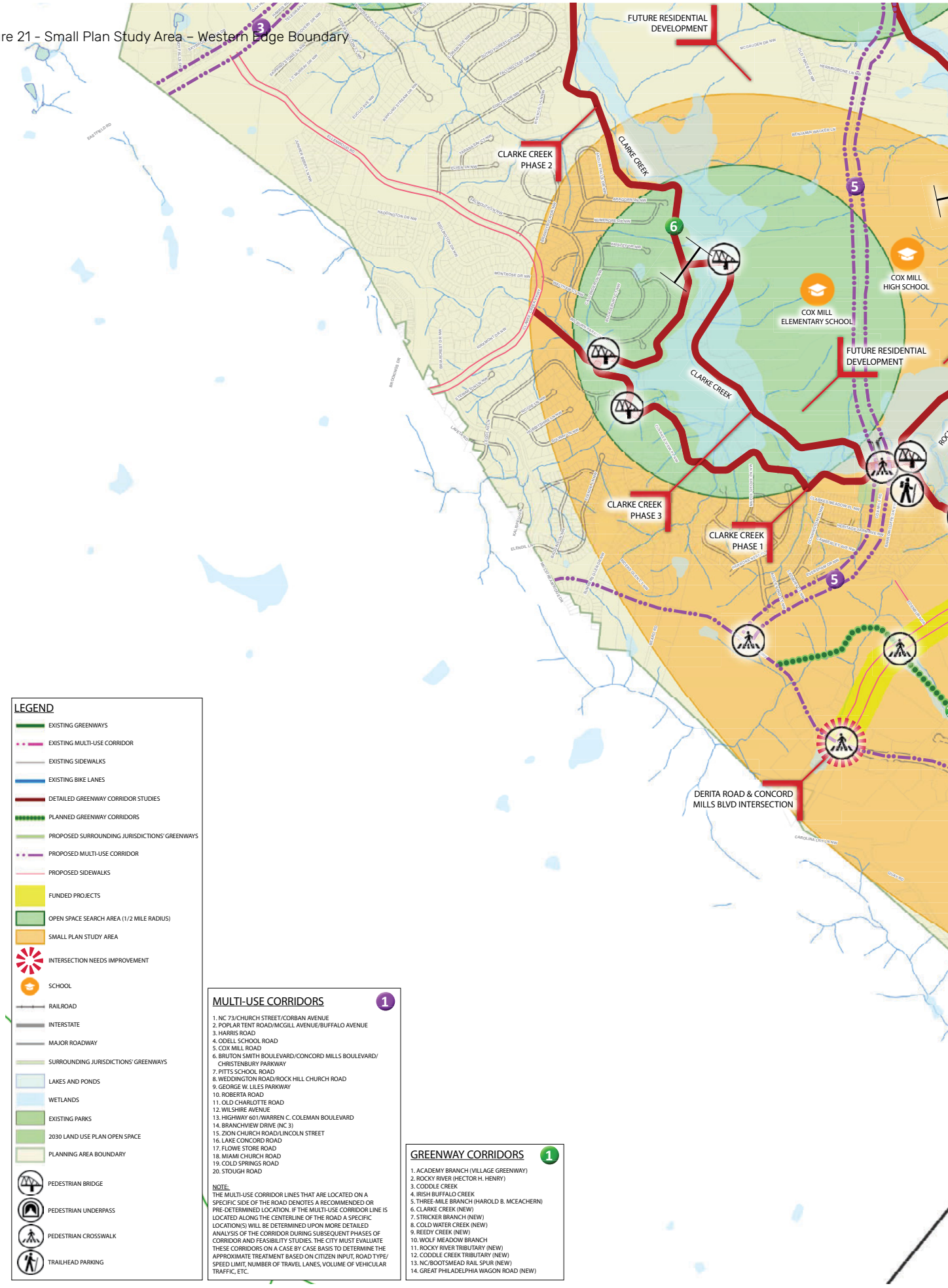
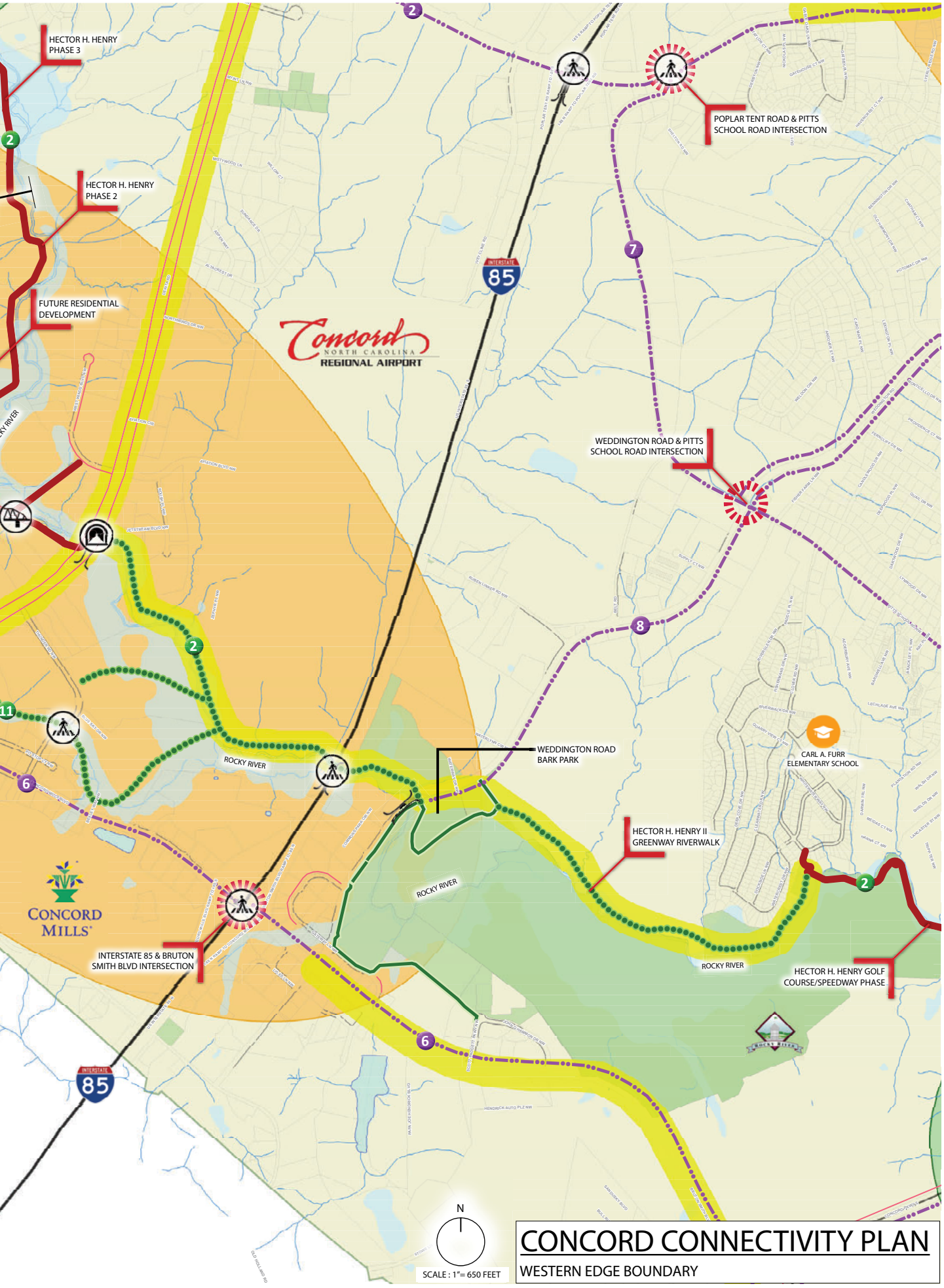

23' MEDIAN
12'
12'
2'
5'
5' SW
3.5'

Figure 21 - Small Plan Study Area – Western Edge Boundary

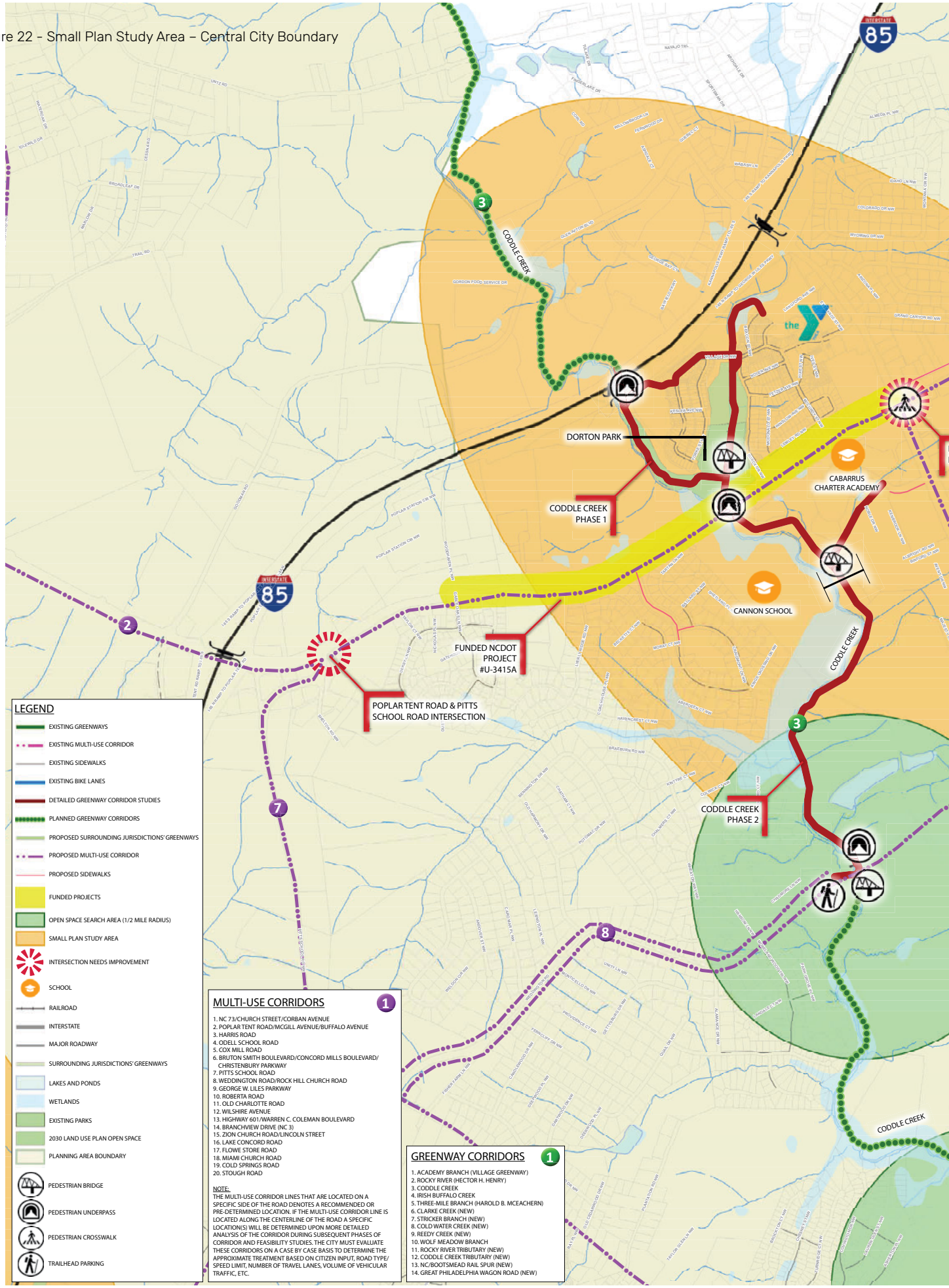


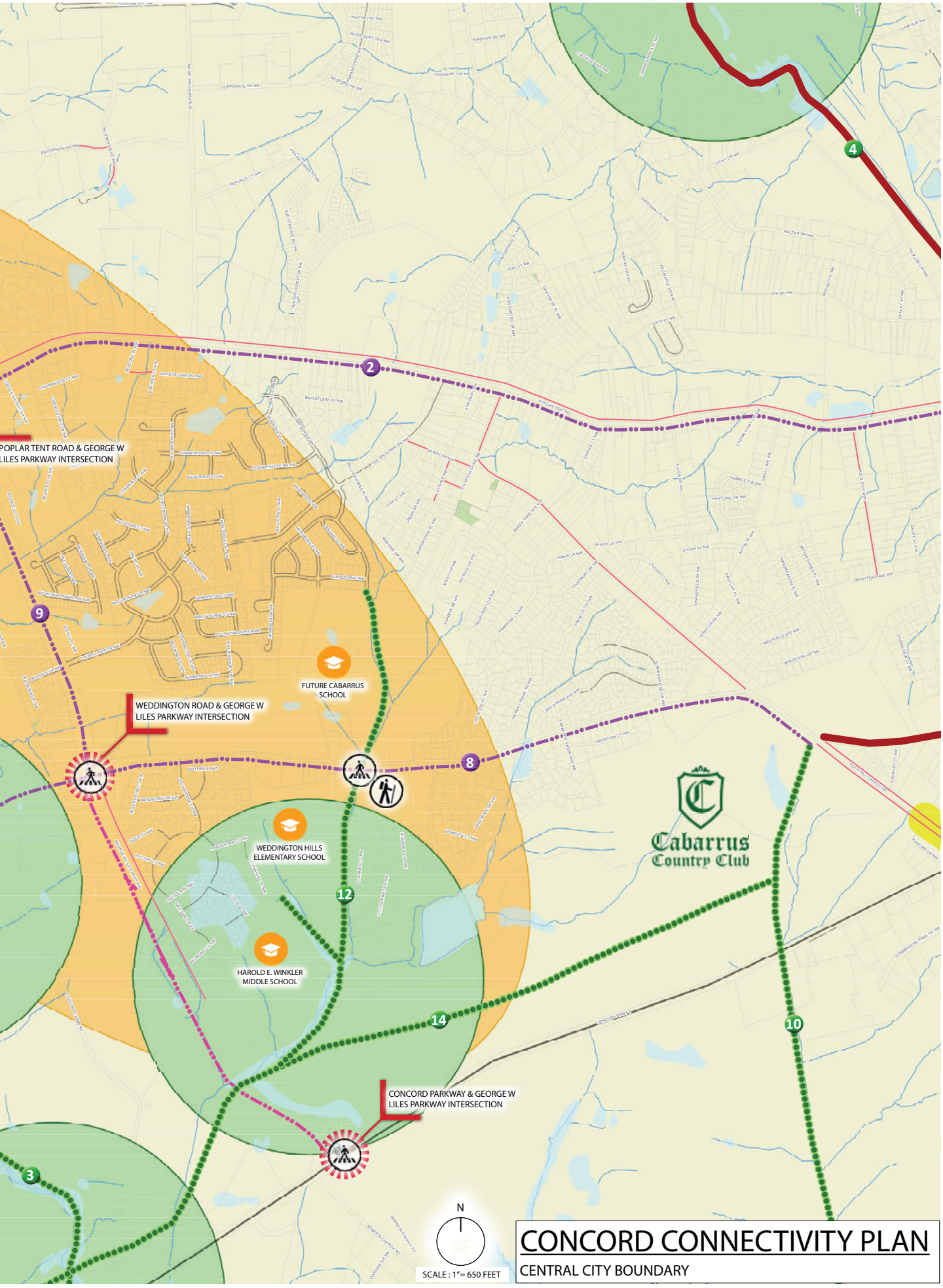


CONCORD CONNECTIVITY PLAN

WESTERN EDGE BOUNDARY

Figure 22 - Small Plan Study Area – Central City Boundary

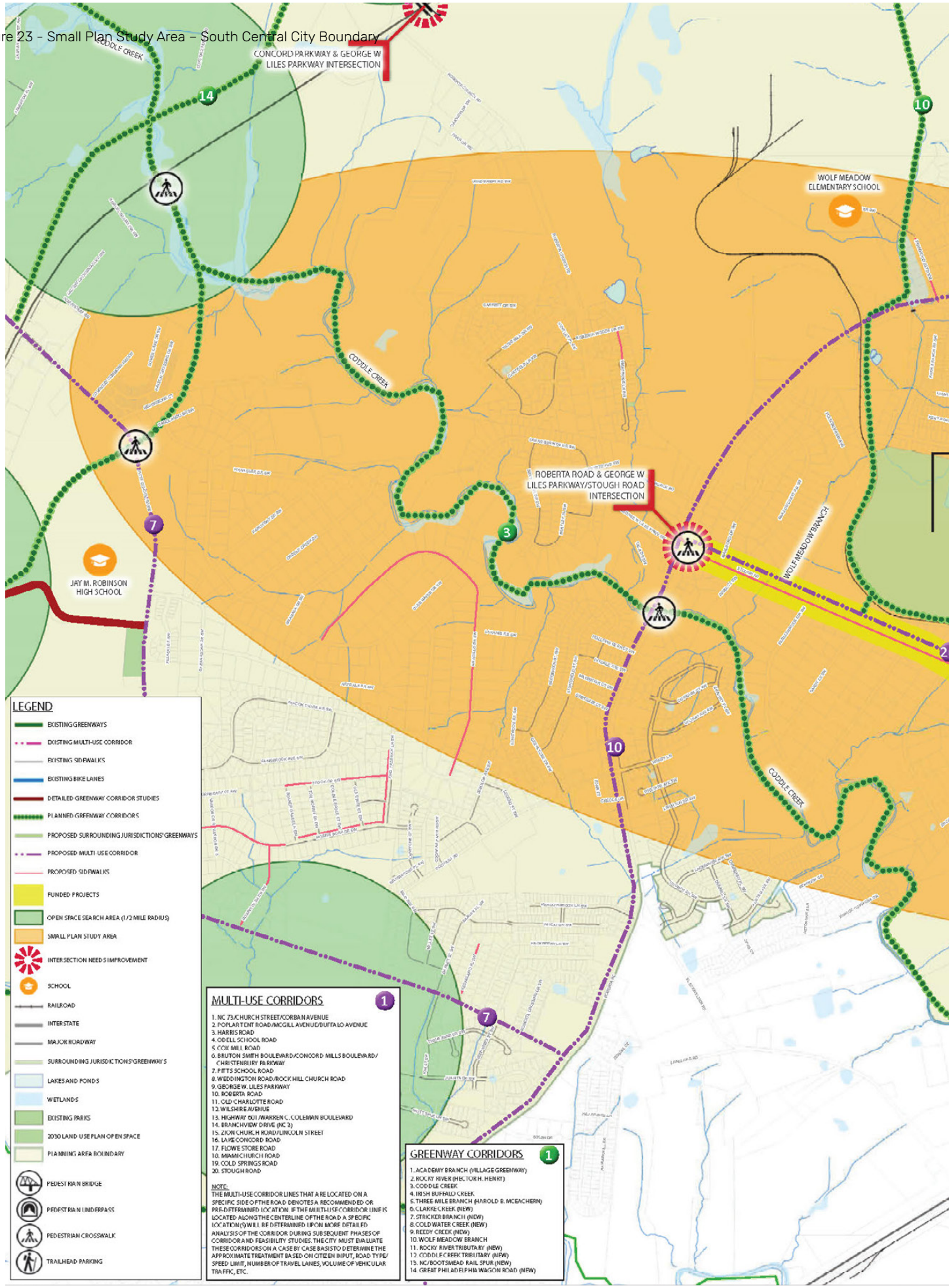




CONCORD CONNECTIVITY PLAN

CENTRAL CITY BOUNDARY

Figure 23 - Small Plan Study Area – South Central City Boundary



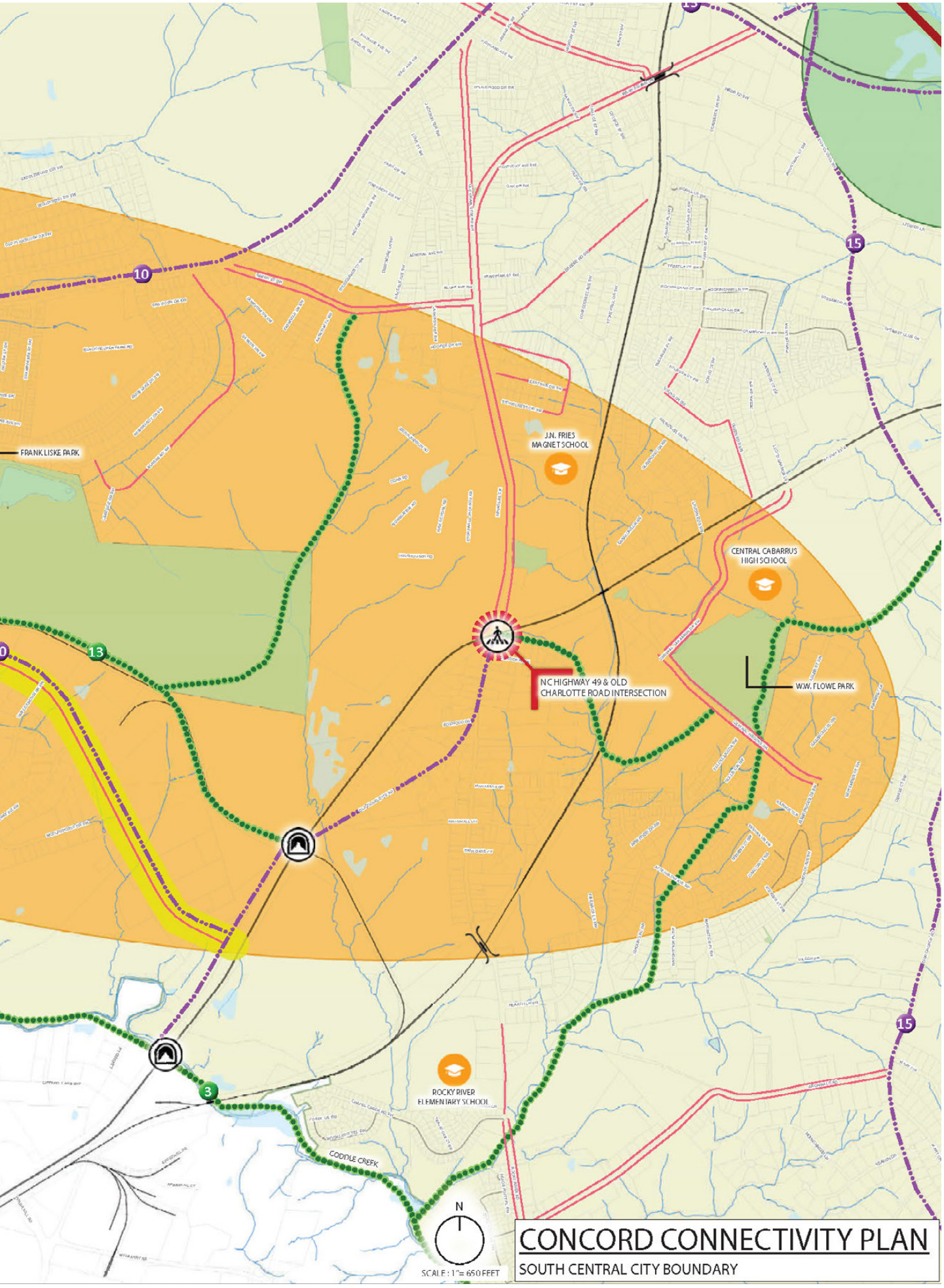
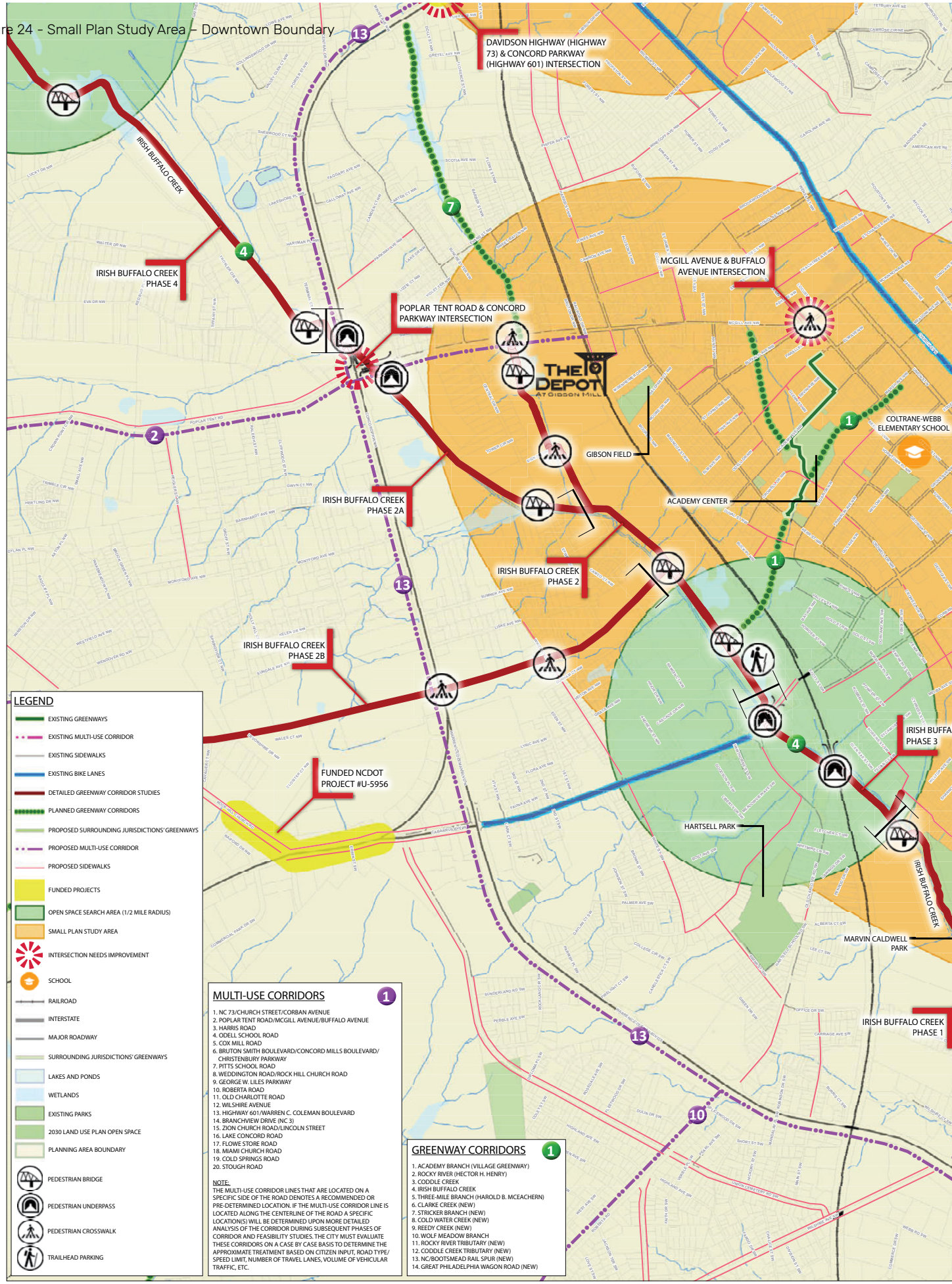
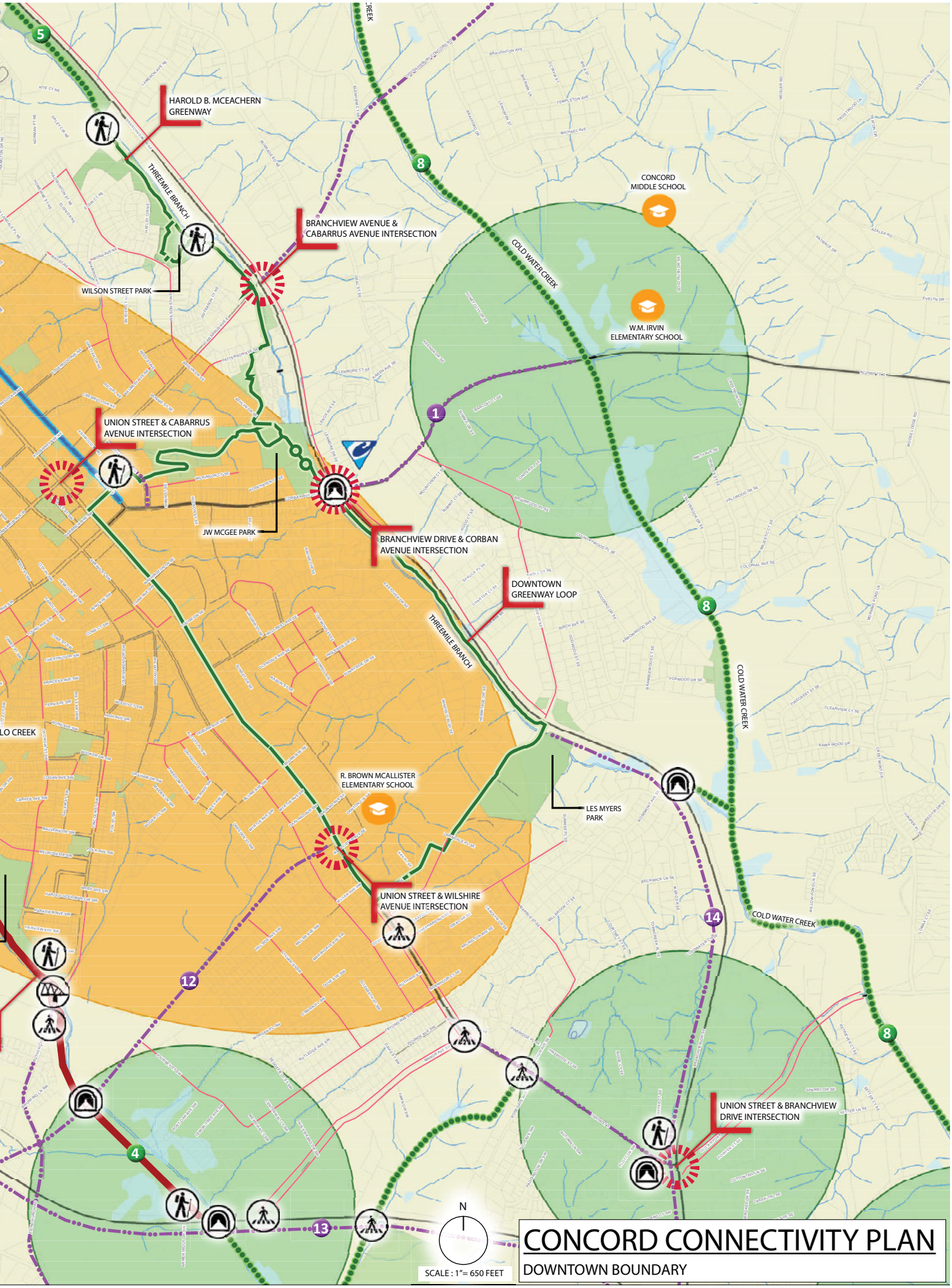

FRANK LISKE PARK
J.N. FRIES MAGNET SCHOOL
CENTRAL CABARRUS HIGH SCHOOL
NC HIGHWAY 49 & OLD CHARLOTTE ROAD INTERSECTION
W.W. FLOWE PARK
ROCKY RIVER ELEMENTARY SCHOOL
CODDLE CREEK
10
13
15
3
N
SCALE: 1" = 650 FEET
CONCORD CONNECTIVITY PLAN
SOUTH CENTRAL CITY BOUNDARY

Figure 24 - Small Plan Study Area – Downtown Boundary

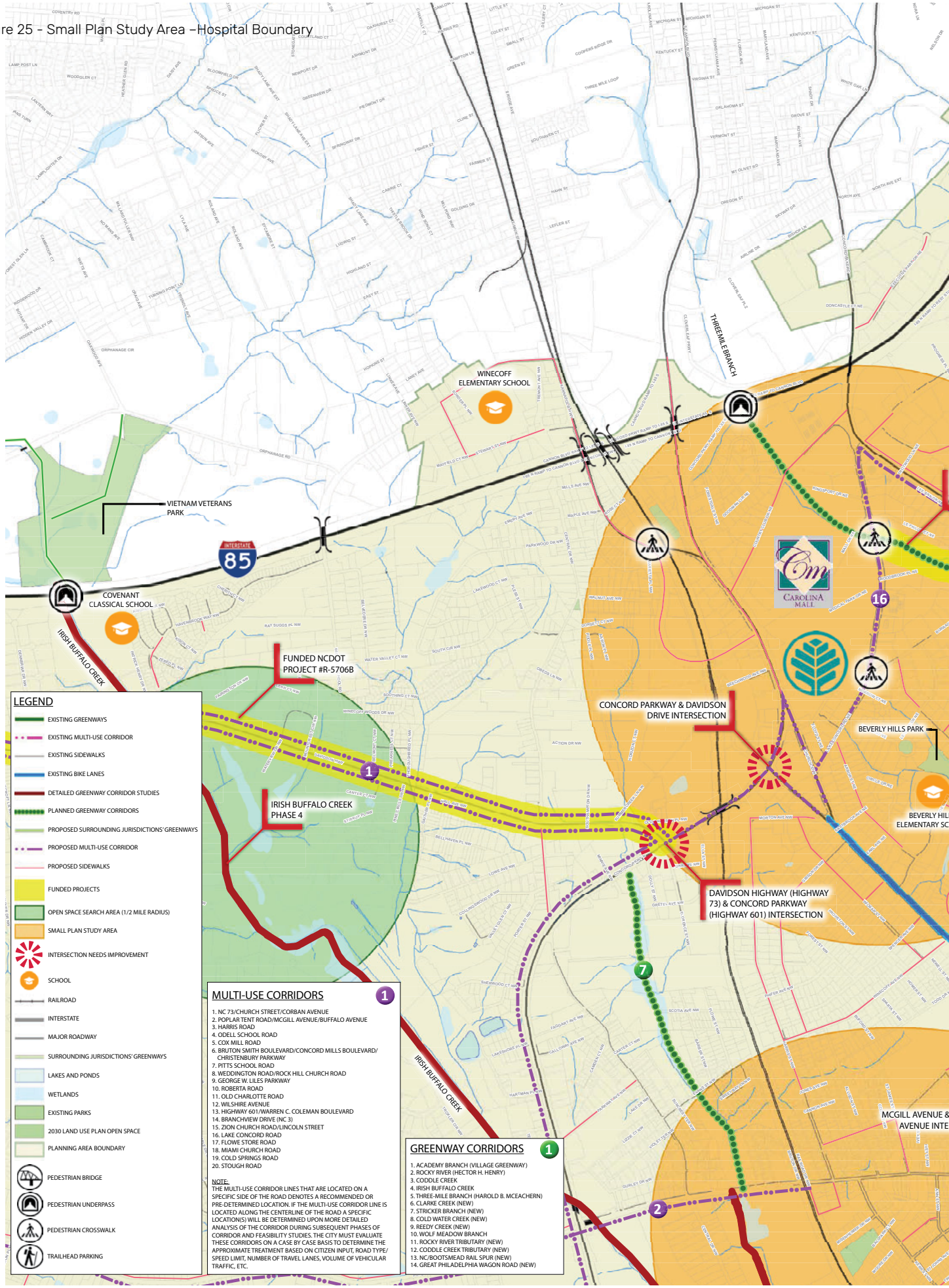


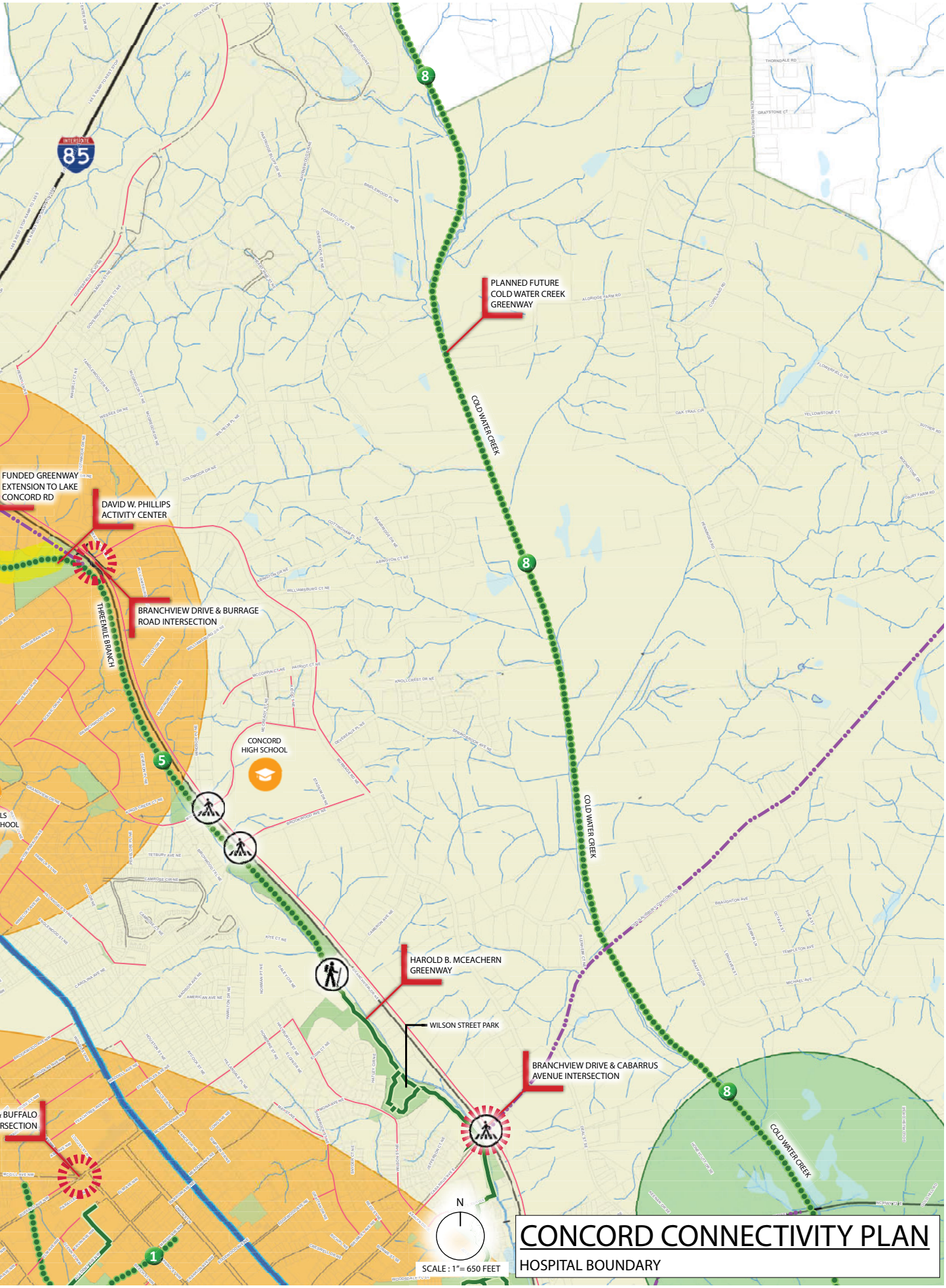


CONCORD CONNECTIVITY PLAN

DOWNTOWN BOUNDARY

Figure 25 - Small Plan Study Area –Hospital Boundary




PLANNED FUTURE COLD WATER CREEK GREENWAY
COLD WATER CREEK
FUNDED GREENWAY EXTENSION TO LAKE CONCORD RD
DAVID W. PHILLIPS ACTIVITY CENTER
BRANCHVIEW DRIVE & BURRAGE ROAD INTERSECTION
THREEMILE BRANCH
CONCORD HIGH SCHOOL
HAROLD B. MCEACHERN GREENWAY
WILSON STREET PARK
BRANCHVIEW DRIVE & CABARRUS AVENUE INTERSECTION
BUFFALO
RSECTION
N
SCALE : 1"= 650 FEET
CONCORD CONNECTIVITY PLAN
HOSPITAL BOUNDARY

DETAILED GREENWAY CORRIDOR STUDIES

The most detailed investigation is presented in the detailed greenway corridor studies where cut sheets are provided to set up priority greenway corridors for future implementation. The detailed greenway corridors were selected based on public input priority corridors and Staff recommendations. Information contained in each cut sheet includes:

- Detailed segment map which identifies streams and wetlands, roads, neighborhoods, schools, parks, and existing pedestrian / bicycle facilities as well as adjacent greenway projects (some of which are detailed in subsequent cut sheets)
- Recommendations
  - Proposed alignment (note: where streams, creeks, or wetlands were inaccessible, assumptions were made to reach an alignment solution)
  - Pedestrian bridge and underpass locations
  - Pedestrian crosswalk locations
  - Trailhead/parking locations
- Routing challenges and opportunities addressing items including but not limited to:
  - Topography
  - Stream crossings
  - Floodplain impacts
  - Observed wetlands
  - Road crossings
- Project Snapshot including:
  - Project Location
  - Project Type
  - Length of Project
  - Estimated Construction Year
  - Trail Trip Generators (i.e. key destinations and activity hubs)
- Previous Planning Efforts
- Potential Right-of-Way Needs
  - Total estimated area needed
  - Number of impacted parcels that are privately owned (not City or County)
  - Number of impacted property owners
- Potential Permitting Needs
- Estimated Project Cost (description on how to use the estimated costs is provided below)
  - 2019 Estimated Construction Costs
  - Escalated Construction Costs (adjusted to reflect the project's estimated construction year)
  - 10% Contingency
  - Estimated Right of Way Costs
  - Estimated Design Services
  - Estimated Construction Engineering and Inspection (CEI) services
- Potential Funding Sources

How to Use Estimated Costs

When reviewing the estimated project costs contained in the subsequent cut sheets, please consider the following:

These are only estimates; all values are rounded up to the nearest one thousand dollars.

The estimated costs are indicative of a planning-level of analysis. No survey, subsurface investigation, or precise measurements were taken to produce base maps.

Elements of the project are priced by using a linear foot (LF) or mile (MI) unit cost from the US dollar value in 2019. Each item is inclusive of all costs associated with their construction. However, these costs should not be taken as a final estimate and should only be used for planning purposes.

Detailed construction cost estimates should be completed during the design phase of each project.

The estimated subtotal of construction costs is escalated out to the fiscal year that each segment is expected to be constructed (see below for how this was calculated by the design team).

Typical elements for each estimate include but are not limited to:

- Cost per linear foot (LF) of 10-foot asphalt trail - $178.87/LF. This price includes grading, base materials, basic drainage, and asphalt.
- Cost per linear foot (LF) of boardwalk - $1,136.29/LF. This price includes piles for foundation, boardwalk substructure, decking, and handrails.
- Cost per linear foot (LF) of bridge - $3,341.36/LF. This price includes bridge foundations, end bents and caps, prefabricated bridge, and bridge erection.
- Cost per linear foot (LF) of erosion control: $21.78/LF. This price includes silt fence and outlets, temporary crossings, construction entrances, etc.
- Cost per mile (MI) of temporary traffic control for construction: $9,894.35/MI. This price includes signs, traffic cones/barrels, temporary concrete barriers, flagmen, etc.

Each estimate was projected to a fiscal year (FY) of probable construction. For example, the fiscal year 2022 is identified as "FY2022". As more detailed information becomes available during the design process, costs will evolve. Costs are listed in the base year of 2019 and should be escalated at a rate of 3.5% (current industry standard) each year thereafter. The formula used is a linear compound interest formula, $A = P(1 + r)^t$

- Where "P" is the original cost in 2019 dollars,
- "r" is the rate of 3.5% escalation, and
- "t" is difference in years from 2019 to construction year (i.e. the "t" value for a project constructed in 2022 would be: t = (2022-2019) = 3.

Each estimate includes a 10% contingency line for unforeseen or unknown costs that may arise during design and construction of projects. Unforeseen or unknown costs may include any flood study permit fees, such as CLOMR/LOMR, any additional construction material costs that may vary over time like steel, utility relocation, etc. Cost estimates for land acquisition/right-of-way needs are based on the City of Concord's assessed property values and are an approximation. The method for attaining costs are based on the current tax value of each property (broken down per square foot) and multiplied by the easement needed for greenway and construction of the greenway. The easement needed is based on the proposed alignments.

Engineering and Planning Services (design costs) can range between 8-14% of construction costs. The cost of design has not been escalated in the estimates with the assumption that design may occur several years before construction and that design fees are somewhat more stable than construction costs. Survey and wetland delineation are included in the design costs as well as whether a FEMA study is needed. Please note that the estimated design costs will be higher on projects that encounter:

- The inclusion of structures such as bridges and boardwalks
- Impacts to FEMA regulated floodways; will require detailed flood modeling and permitting
- Where federal funding is utilized – this requires a high level of regulatory compliance
- If the project is smaller in size/scope

Construction Engineering and Inspection (CEI) services account for a third party CEI firm providing to the City documentation of the construction, reviews submittals, approval of pay applications, and coordination with NCDOT on federally and state funded projects. Fees for CEI services range between 8% and 12% of the construction costs. Since the CEI occurs at the same time as the construction, the estimate is based on the escalated construction costs to the calculation of the CEI fee. The City may also provide CEI services in-house for non-state or non-federal funded projects as a cost savings option.

Estimated Budget Recommendation Quick Key

2019 Construction Estimate (Basis for Calculations):	(Basic elements of the project) x (linear feet x unit cost)
Escalated Construction Cost Estimate (Design Year):	Basis compounded at 3.5% annually to the Design Year
10% Contingency:	10% of escalated construction estimate
Estimated Right of Way Costs:	(Estimated easement area) x (current tax value)
Estimated Design Services ±3%	11% of 2019 Basis cost +/-3% adjusted per project
Estimated CEI Services ±2%	10% of escalated cost +/-2% adjusted per project
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**TOTAL**



CUT SHEETS START ON THE FOLLOWING PAGE >

HECTOR HENRY GREENWAY > PHASE 1

CANNON CROSSING PHASE

This section of the Hector Henry Greenway extends along Rocky River from Poplar Tent to north of Harris Road with connections to Odell Elementary and Harris Road Middle Schools. The City intends this phase to connect to multi-use paths that will be included in TIP#U-6029 on Poplar Tent Road. As part of the U-6029 project, a new roadway bridge at Poplar Tent Road over Rocky River should include room, both horizontally and vertically, for a pedestrian underpass on both sides of the creek to allow for future trail network expansion.

Project Snapshot

- Project Location: Between Poplar Tent and Harris Roads
- Project Type: Greenway
- Length of Project: 1.64 Miles
- Estimated Construction Year: 2021
- Trail Trip generators
  - Harris Road Middle School
  - Odell Elementary School
  - Carolina International School
  - Cannon Crossing Neighborhood
  - Cannon Crossing Shopping Center
  - Courtyards on Poplar Tent

Previous Planning Efforts

- Livable Community Blueprint for Cabarrus County (2001-2010)
- Carolina Thread Trail Master Plan – For Cabarrus County Communities (2009)

Potential Right of Way Needs

- Total estimated area needed: 8.77 AC
- Number of impacted parcels (not City or County owned): 9
- Number of impacted property owners: 6

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

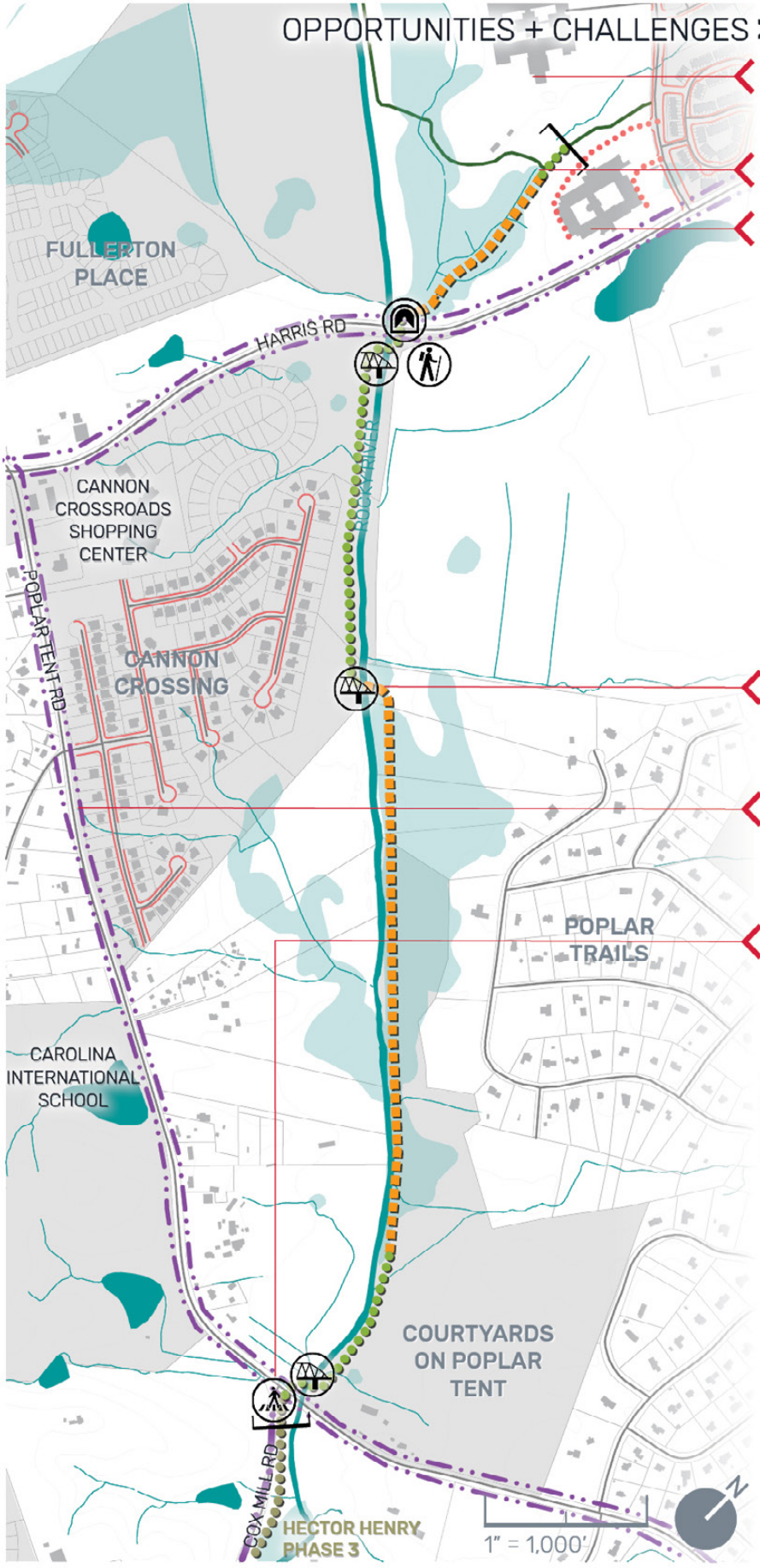
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 3,489,000.00
Escalated Construction Cost Estimate (FY2021):	$ 3,868,000.00
10% Contingency:	$ 387,000.00
Estimated Right of Way Costs:	$ 60,000.00
Estimated Design Services ±3% *adjust per project	$ 384,000.00
Estimated CEI Services ±2% *adjust per project	$ 387,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 5,086,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding
- Bonds

OPPORTUNITIES + CHALLENGES > HECTOR HENRY PHASE 1



Harris Road Middle School

Connection to existing greenway

Odell Elementary School

Alignment located on east side of Rocky River due to challenging property acquisition.

Poplar Tent will be widened by NCDOT. The City of Concord desires a multi-use path to be included in the widening project.

NCDOT widening project will include bridge replacement. New bridge should accommodate a pedestrian underpass for future phase 3.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

HECTOR HENRY GREENWAY > PHASE 2

COX MILL HIGH SCHOOL TO DERITA ROAD

This section of the Hector Henry Greenway connects Cox Mill High School to Derita Road along the west side of Rocky River. This section will connect the funded Airport Phase of Hector Henry Greenway to the future Hector Henry Greenway Phase 3 section to the north, as well as provide a link to Clarke Creek Greenways to the west across Cox Mill Road and becomes part of the Cox Mill Loop. A pedestrian underpass should be attempted under Derita road to provide a grade separated crossing during the current Derita Road widening project. Care must be taken to avoid the high quality wetlands along the alignment.

Project Snapshot

- Project Location: Between Derita Road and Cox Mill High School
- Project Type: Greenway
- Length of Project: 1.35 Miles
- Estimated Construction Year: 2023
- Trail Trip generators
  - Cox Mill High School
  - Cox Mill Elementary School
  - West Winds Business Park
  - Christenbury Neighborhood

Previous Planning Efforts

- Livable Community Blueprint for Cabarrus County (2001-2010)
- Carolina Thread Trail Master Plan – For Cabarrus County Communities (2009)

Potential Right of Way Needs

- Total estimated area needed: 6.97 AC
- Number of impacted parcels (not City or County owned): 5
- Number of impacted property owners: 4

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

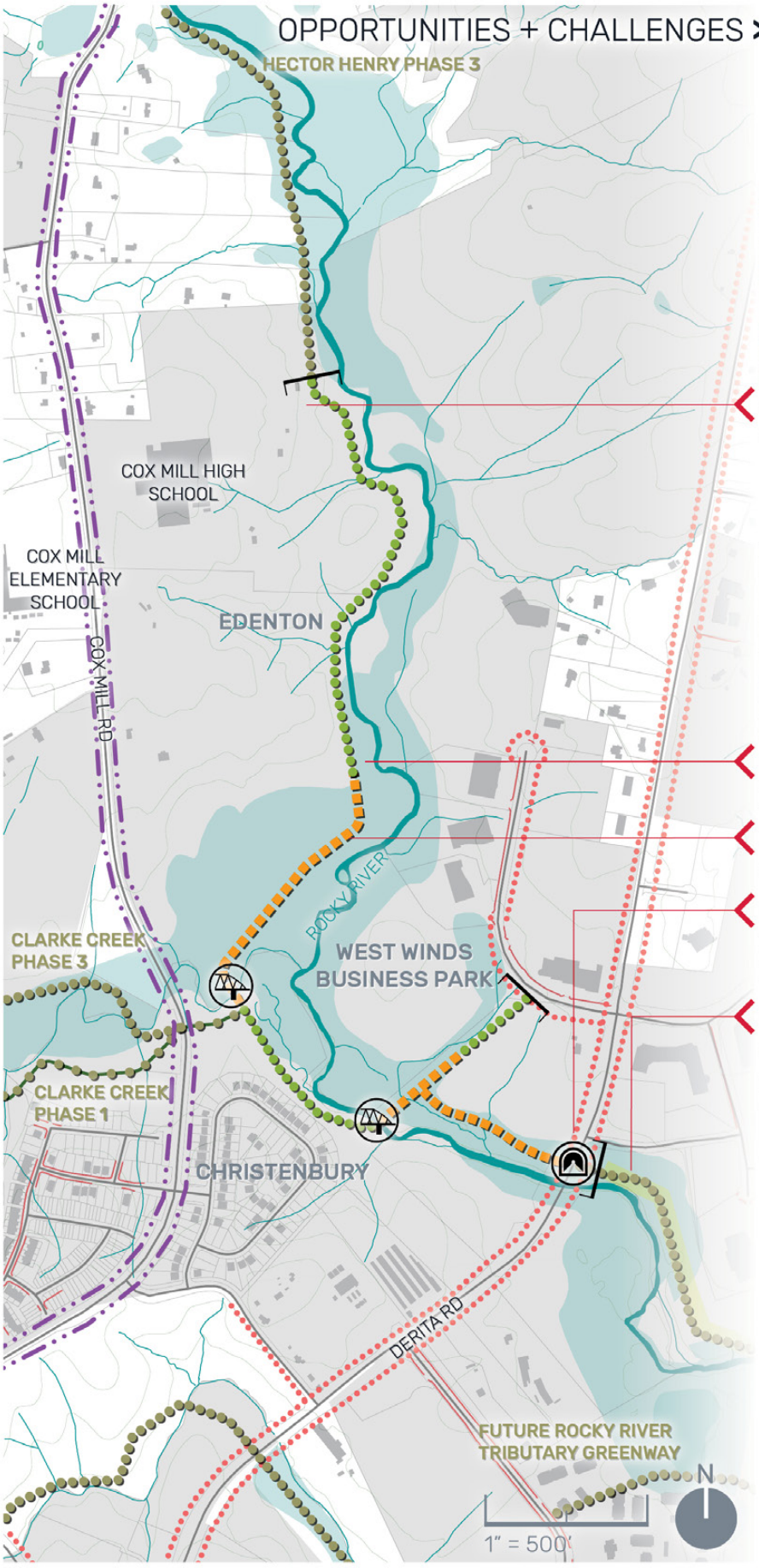
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 2,969,000.00
Escalated Construction Cost Estimate (FY2023):	$ 3,527,000.00
10% Contingency:	$ 353,000.00
Estimated Right of Way Costs:	$ 40,000.00
Estimated Design Services ±3% *adjust per project	$ 327,000.00
Estimated CEI Services ±2% *adjust per project	$ 353,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 4,600,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding
- Bonds

OPPORTUNITIES + CHALLENGES > HECTOR HENRY PHASE 2





Greenway will allow Cox Mill High School to connect with trail network.



High-quality wetlands provide potential educational opportunity.

Project will require FEMA floodplain modeling and permitting

Derita Road widening currently in progress. Bench modification beneath bridge required.

Funded Hector Henry Greenway - Airport Greenway Phase

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

HECTOR HENRY GREENWAY > PHASE 3

COX MILL HIGH SCHOOL TO POPLAR TENT ROAD

This section of the Hector Henry Greenway connects the previously planned Phase 2 section at Cox Mill High School and extends NW along the west side of Rocky River up to Poplar Tent Road. It is anticipated that the greenway trail will replace the sidewalk/multi-use path on the east side of Cox Mill Road where the greenway trail comes into proximity to Cox Mill Road. This replacement scenario extends up to Poplar Tent Road. The City intends to connect to multi-use paths along Poplar Tent Road as part of the road widening project TIP#U-6029. It is recommended to examine the opportunity to have a roadway bridge with a pedestrian underpass that would allow a grade separated crossing on both sides of Rocky River.

An alternative alignment is to look at bridging across Rocky River once the greenway is in proximity to Cox Mill Road and following the east side of the river to Poplar Tent. In the alternative scenario, the trail would end at Poplar Tent Road with an at grade crossing to connect to Hector Henry Phase 1.

Project Snapshot

- Project Location: Between Cox Mill High School and Poplar Tent Road
- Project Type: Greenway
- Length of Project: 0.88 Miles
- Estimated Construction Year: 2034
- Trail Trip generators
  - Cox Mill High School

Previous Planning Efforts

- Livable Community Blueprint for Cabarrus County (2001-2010)
- Carolina Thread Trail Master Plan – For Cabarrus County Communities (2009)

Potential Right of Way Needs

- Total estimated area needed: 4.80 AC
- Number of impacted parcels (not City or County owned): 7
- Number of impacted property owners: 7

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

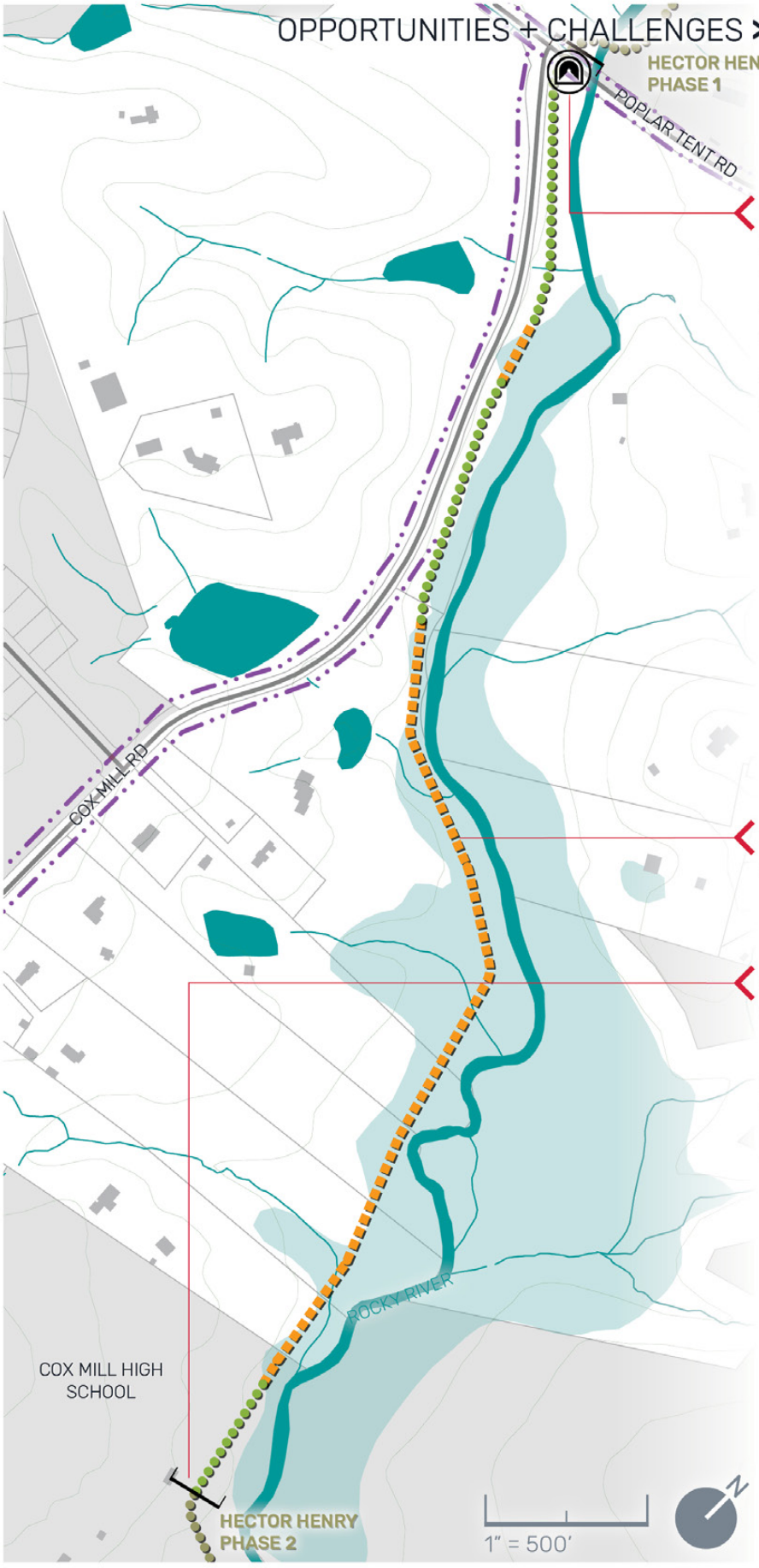
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 1,798,000.00
Escalated Construction Cost Estimate (FY2034):	$ 3,117,000.00
10% Contingency:	$ 312,000.00
Estimated Right of Way Costs:	$ 60,000.00
Estimated Design Services ±3% *adjust per project	$ 198,000.00
Estimated CEI Services ±2% *adjust per project	$ 312,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 3,999,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding
- Bonds

OPPORTUNITIES + CHALLENGES > HECTOR HENRY PHASE 3



Replacement of existing vehicular bridge concurrent with NCDOT future widening project is critical for a better greenway connection and crossing of Poplar Tent Road. The City of Concord desires multi-use paths on both sides of Poplar tent.

Project will require FEMA floodplain modeling and permitting.

Greenway will allow Cox Mill High School to connect with trail network.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

HECTOR HENRY GREENWAY > GOLF COURSE / SPEEDWAY PHASE

This section of the Hector Henry Greenway connects to and extends the proposed Riverwalk Greenway south along the Rocky River just past Concord Parkway (US-29). This section will provide off-road access for bicyclists and pedestrians to the Speedway via US-29. A future section of trail will connect the Golf Course/ Speedway Phase of Hector Henry to Pitts School Road Elementary and J.M Robinson High School. The City intends to connect to multi-use paths on Concord Parkway, connecting the greenway to the Speedway. An alternative to the alignment shown is to stay on the west side of Rocky River to Concord Parkway and work with the Speedway to avoid potential conflicts with the drag strip. This would accommodate even more users on race day and help alleviate roadway congestion.

Project Snapshot

- Project Location: Between Rocky River Golf Club and US-29
- Project Type: Greenway
- Length of Project: 3.10 Miles
- Estimated Construction Year: 2024
- Trail Trip generators
  - Charlotte Motor Speedway
  - Riverwalk neighborhood
  - Rocky River Golf Club
  - Weddington Rd. Bark Park
  - Embassy Suites Hotel+Convention Center
  - J.M. Robinson High School
  - Pitts School Road Elementary
  - Carl Furr Elementary

Previous Planning Efforts

- Carolina Thread Trail Master Plan – For Cabarrus County Communities (2009)
- Rocky River Corridor Study (2008)

Potential Right of Way Needs

- Total estimated area needed: 16.5 AC
- Number of impacted parcels (Not owned by City or County): 11
- Number of impacted property owners: 10

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

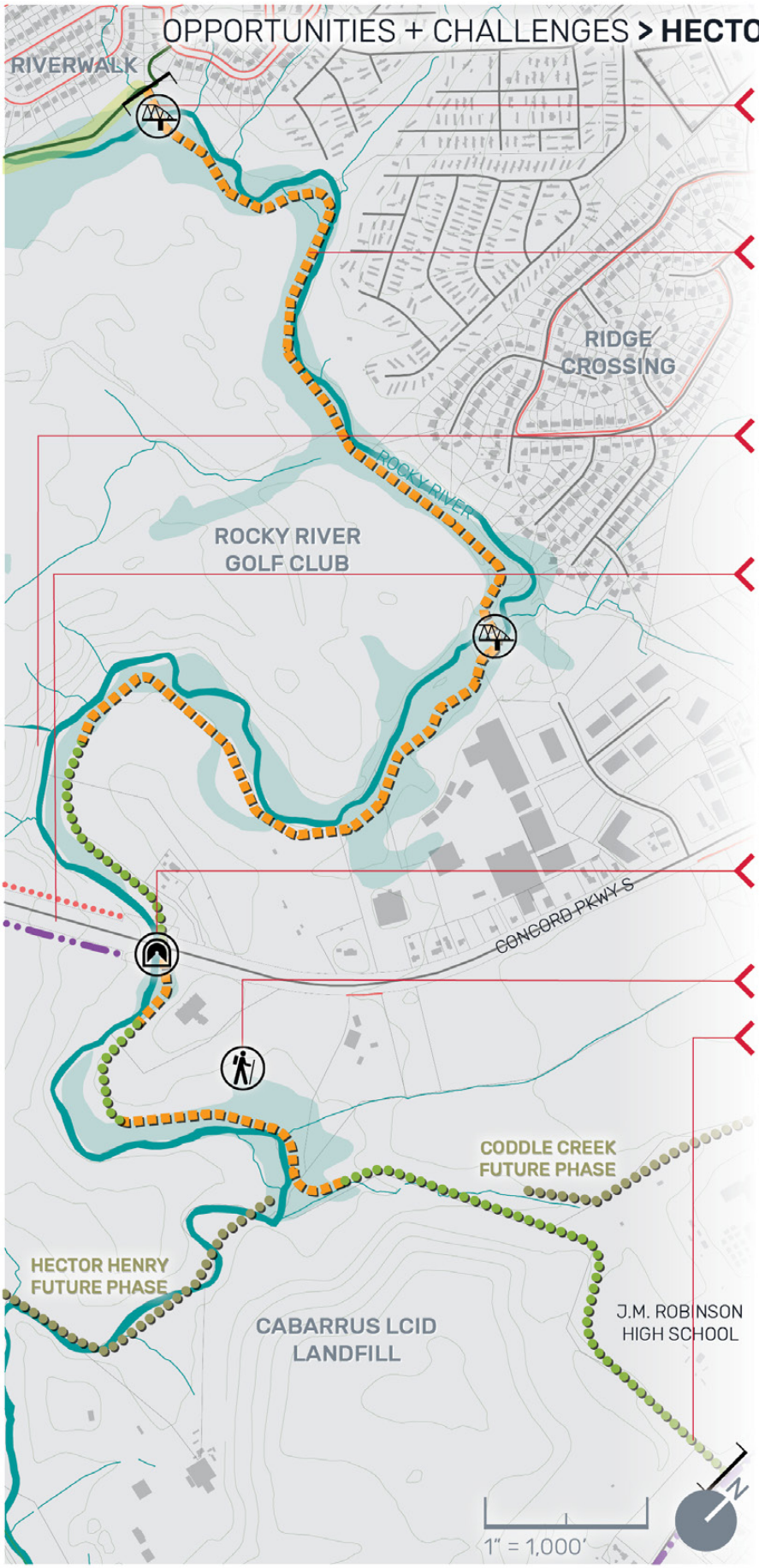
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 6,066,000.00
Escalated Construction Cost Estimate (FY2024):	$ 7,457,000.00
10% Contingency:	$ 746,000.00
Estimated Right of Way Costs:	$ 330,000.00
Estimated Design Services ±3% *adjust per project	$ 668,000.00
Estimated CEI Services ±2% *adjust per project	$ 746,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 9,947,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding – TAP, CMAQ
- City of Concord CIP funding
- Bonds
- Build Grant
- Carolina Thread Trail Grant

OPPORTUNITIES + CHALLENGES > HECTOR HENRY GOLF COURSE / SPEEDWAY PHASE



Connection to Riverwalk neighborhood trail

Boardwalk required in wetlands. Project will require FEMA floodplain modeling and permitting.

Utility easement, multiple streams and drag strip footprint constrains possible alignment on west side of Rocky River.

Proposed Multi-Use Corridor to Charlotte Motor Speedway



Concord Parkway bridge over Rocky River creates opportunity for grade separation.

Potential trailhead / neighborhood park.

Connect to Pitts School Road

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

CLARKE CREEK GREENWAY > PHASE 1

CLARK CREEK PARKWAY TO THE ROCKY RIVER/CLARKE CREEK CONFLUENCE - PART OF THE COX MILL SCHOOL LOOP

Clarke Creek Greenway Phase 1 improves and enhances the existing private community trails of Christenbury and Highland Creek, converting them into a City Greenway. As part of the Cox Mill School Loop, this trail extends from Clarke Creek Parkway east to Cox Mill Road, providing many residents with direct greenway access. Future phases of the Clarke Creek Greenway will connect north to Harris Road and east to the schools.

Project Snapshot

- Project Location: Between Clarke Creek Parkway and the confluence of Rocky River and Clarke Creek. Trailhead parking is proposed off Cox Mill Road.
- Project Type: Greenway
- Length of Project: 1.81 Miles
- Estimated Construction Year: 2023
- Trail Trip generators
  - Highland Creek Neighborhood
  - Christenbury Neighborhood

Previous Planning Efforts

- Livable Community Blueprint for Cabarrus County (2001-2010)

Potential Right of Way Needs

- Total estimated area needed: 9.23AC
- Number of impacted parcels (not City or County owned): 10
- Number of impacted property owners: 2

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

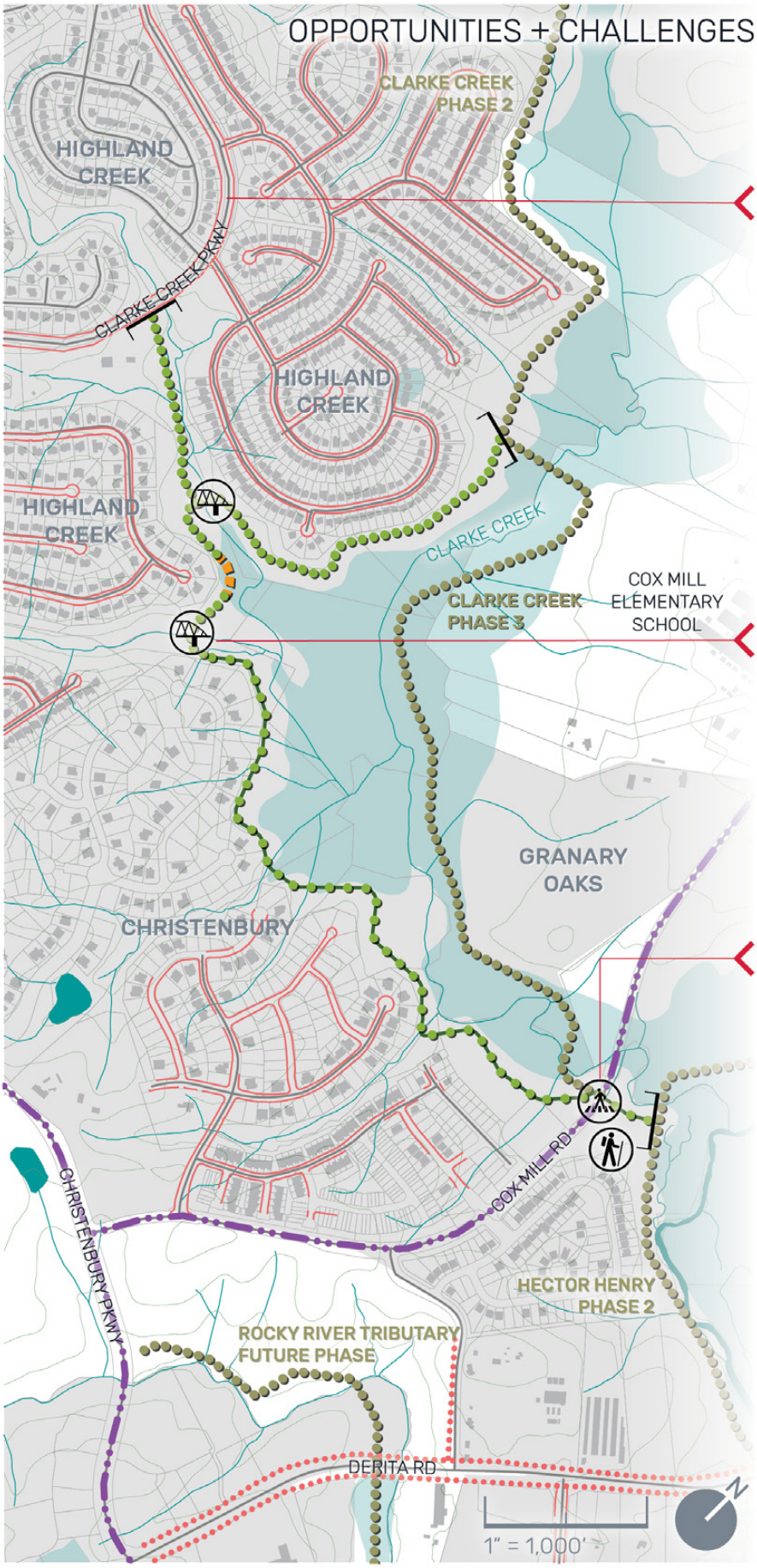
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 2,570,000.00
Escalated Construction Cost Estimate (FY2023):	$ 3,052,000.00
10% Contingency:	$ 306,000.00
Estimated Right of Way Costs:	$ 30,000.00
Estimated Design Services ±3% *adjust per project	$ 283,000.00
Estimated CEI Services ±2% *adjust per project	$ 306,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 3,977,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding
- Bonds

OPPORTUNITIES + CHALLENGES > CLARKE CREEK PHASE 1



Clarke Creek Parkway and neighborhood streets are lined on both sides by sidewalks. In addition, Clarke Creek Parkway is wide enough to accommodate striped bike lanes.



Work with neighborhoods to improve existing greenway trails. City of Concord to assume management.



Traffic volume and vehicular speed on Cox Mill Road requires signalized crossing based on traffic volumes and road speed.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

CLARKE CREEK GREENWAY > PHASE 2

HARRIS ROAD TO PHASE 1 AT HIGHLAND CREEK

Clark Creek Greenway Phase 2 provides a greenway extension around the Highland Creek neighborhood along Clarke Creek that begins at the end of Clarke Creek Greenway Phase 1, extending north to Harris Road and the Skybrook neighborhood. Connections to the Winding Walk community will allow additional trail users access to the network and eventually to Cox Mill Schools (with the addition of Clarke Creek Greenway Phase 3).

Project Snapshot

- Project Location: Between the terminus of Phase 1 in Highland Creek to Harris Road
- Project Type: Greenway
- Length of Project: 2.04 Miles
- Estimated Construction Year: 2022
- Trail Trip generators
  - Highland Creek Neighborhood
  - Winding Walk
  - Cox Mill elementary School
  - Allen Mills Neighborhood
  - Odell Recreation Fields

Previous Planning Efforts

- Cabarrus County Livable Communities Blueprint

Potential Right of Way Needs

- Total estimated area needed: 10 AC
- Number of impacted parcels (not City or County owned): 14
- Number of impacted property owners: 9

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

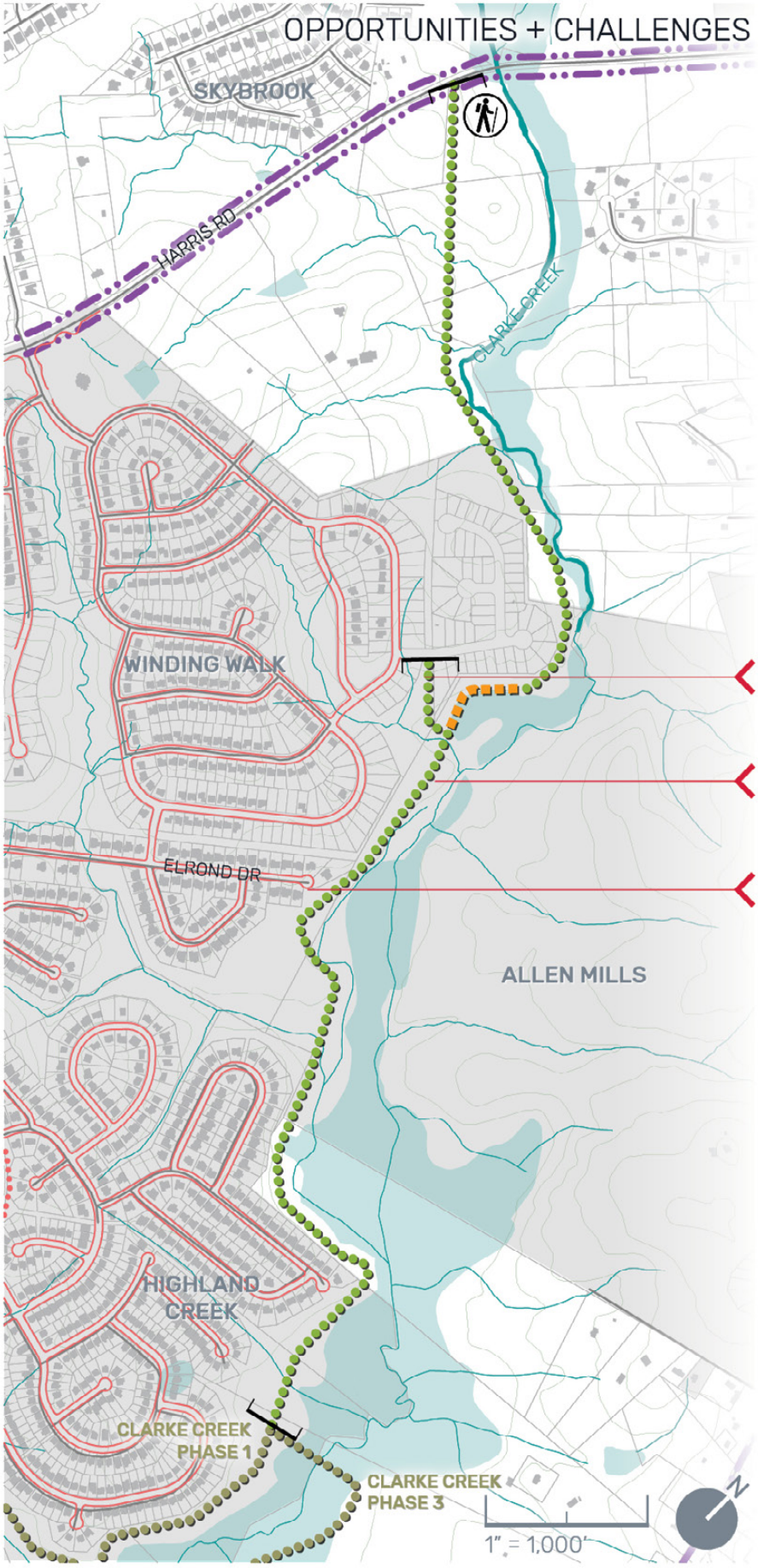
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 2,698,000.00
Escalated Construction Cost Estimate (FY2034):	$ 4,678,000.00
10% Contingency:	$ 468,000.00
Estimated Right of Way Costs:	$ 80,000.00
Estimated Design Services ±3% *adjust per project	$ 297,000.00
Estimated CEI Services ±2% *adjust per project	$ 468,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 5,991,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding
- Bonds

OPPORTUNITIES + CHALLENGES > CLARKE CREEK PHASE 2



Potential connection to Winding Walk neighborhood.

Project will require FEMA floodplain modeling and permitting.

Potential connector trail to neighborhood.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

CLARKE CREEK GREENWAY > PHASE 3

COX MILL ROAD TO PHASE 1 AND 2 INTERSECTION AT HIGHLAND CREEK

Part of the Cox Mill School Loop, Clark Creek Greenway Phase 3 extends from Cox Mill Road west on the east side of the creek, crossing the creek to connect to the intersection of Clarke Creek Greenway Phases 1 and 2 in the Highland Creek Neighborhood.

Project Snapshot

- Project Location: Between Cox Mill Road to Highland Creek neighborhood
- Project Type: Greenway
- Length of Project: 1.05 Miles
- Estimated Construction Year: 2023
- Trail Trip generators
  - Cox Mill Elementary School
  - Highland Creek Neighborhood
  - Christenbury Neighborhood

Previous Planning Efforts

- Livable Community Blueprint for Cabarrus County (2001-2010)

Potential Right of Way Needs

- Total estimated area needed: 5.64 AC
- Number of impacted parcels (not City or County owned): 5
- Number of impacted property owners: 4

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

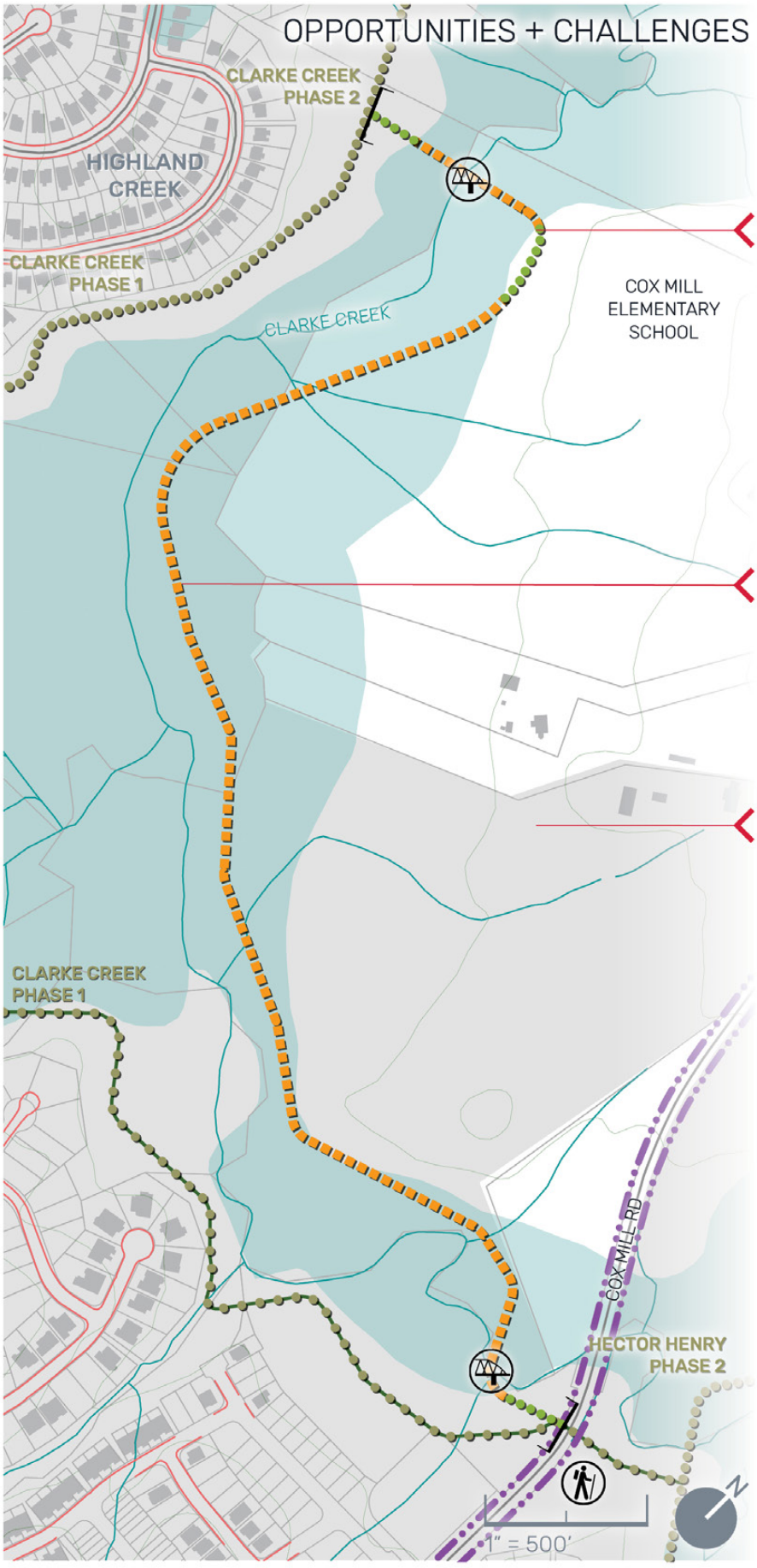
Estimate Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 1,887,000.00
Escalated Construction Cost Estimate (FY2023):	$ 2,241,000.00
10% Contingency:	$ 225,000.00
Estimated Right of Way Costs:	$ 10,000.00
Estimated Design Services ±3% *adjust per project	$ 208,000.00
Estimated CEI Services ±2% *adjust per project	$ 225,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 2,909,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding
- Bonds

OPPORTUNITIES + CHALLENGES > CLARKE CREEK PHASE 3



Connection to school athletic fields



Construction of greenway trail through assumed jurisdictional wetland will require permitting and boardwalks where necessary.

Project will require FEMA floodplain modeling and permitting.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

CODDLE CREEK GREENWAY > PHASE 1

DORTON PARK / AFTON VILLAGE TO POPLAR CROSSING DRIVE

This phase of Coddle Creek Greenway creates a loop within the Afton Village community, tying into Dorton Park. There are also connections to the West Cabarrus YMCA, Cannon School, Poplar Crossing Commons, Cabarrus Charter Academy, and a future connection under I-85 to Afton Ridge in Kannapolis. This phase utilizes several existing on-street and sidewalk connections within Afton Village to complete the phase, thus reducing the overall costs for construction and potential right of way acquisition needs. Off-street, multi-use paths may be incorporated but would require additional study, community input, and cost. With this project, stream restoration of Afton Run Branch is possible.

Project Snapshot

- Project Location: Afton Village and Dorton Park
- Project Type: Greenway
- Length of Project: 2.2 Miles
- Estimated Construction Year: 2022
- Trail Trip generators
  - Dorton Park
  - Afton Village Community
  - West Cabarrus YMCA
  - Cannon School
  - Cabarrus Charter Academy
  - Poplar Crossing Commons
  - Legacy Apartments

Previous Planning Efforts

- Livable Community Blueprint for Cabarrus County (2001-2010)

Potential Right of Way Needs

- Total estimated area needed: 5.30 AC
- Number of impacted parcels (Not city owned): 13
- Number of impacted property owners: 10

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

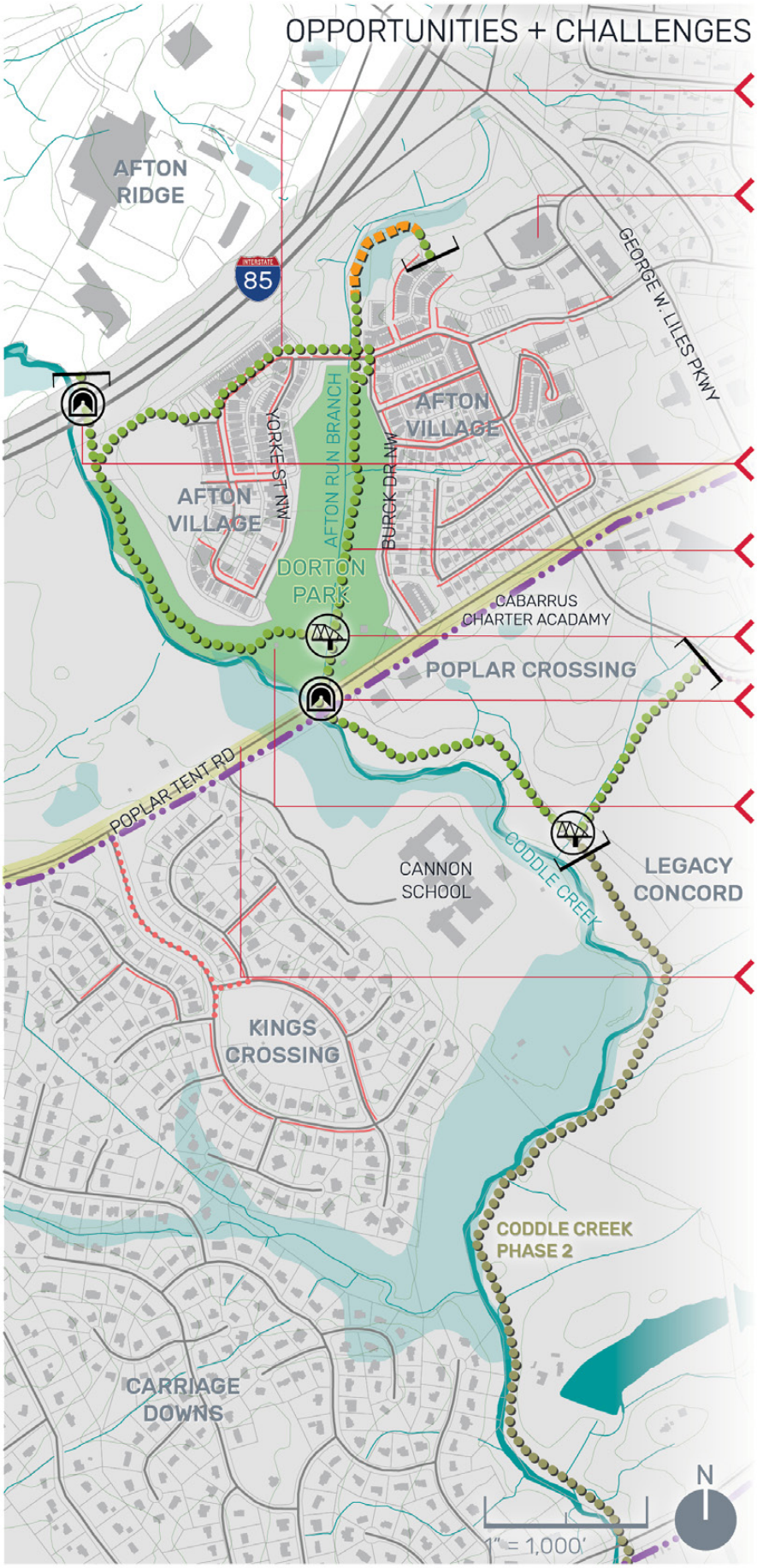
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$	2,541,000.00
Escalated Construction Cost Estimate (FY2022):	$	2,916,000.00
10% Contingency:	$	292,000.00
Estimated Right of Way Costs:	$	320,000.00
Estimated Design Services ±3% *adjust per project	$	280,000.00
Estimated CEI Services ±2% *adjust per project	$	292,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$**	**4,100,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding – TAP, CMAQ
- City of Concord CIP funding
- Bonds

OPPORTUNITIES + CHALLENGES > CODDLE CREEK PHASE 1



Tight neighborhood street requires use of sidewalks and sharrows.

West Cabarrus YMCA



I-85 bridge over Coddle Creek allows space for greenway passage under.

Opportunity for stream restoration along Afton Run Branch.

Existing pedestrian bridge over Afton Run Branch.

Connector trail would provide access between future multi-use path along Poplar Tent Road and greenway.

At 30 acres, Dorton Park contains soccer fields, tennis courts, picnic shelters, play equipment, disc golf and walking trails along Coddle Creek and Afton Run Branch.

NCDOT Project U-3415A. Poplar Tent improvement project. City of Concord designated multi-use corridor.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

CODDLE CREEK GREENWAY > PHASE 2

POPLAR CROSSING TO WEDDINGTON ROAD

The second phase of the Coddle Creek Greenway extends Coddle Creek Greenway Phase 1 from Poplar Crossing to Weddington Road where a new trailhead will be built as part of the project. This beautiful section of creek connects several schools and communities. A multi-use path on the south side of Weddington will eventually tie the Coddle Creek Greenway to the new West Cabarrus High School.

Project Snapshot

- Project Location: Between Weddington Road and Poplar Crossing
- Project Type: Greenway
- Length of Project: 1.09 Miles
- Estimated Construction Year: 2022
- Trail Trip generators
  - West Cabarrus High School
  - Harold Winkler Middle School
  - Weddington Hills Elementary
  - Willow Oaks Crossing (Publix)
  - Cannon School
  - Cabarrus Charter Academy

Previous Planning Efforts

- Concord Comprehensive Parks and Recreation Master Plan (2016)

Potential Right of Way Needs

- Total estimated area needed: 5.65 AC
- Number of impacted parcels (Not City owned): 3
- Number of impacted property owners: 2

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

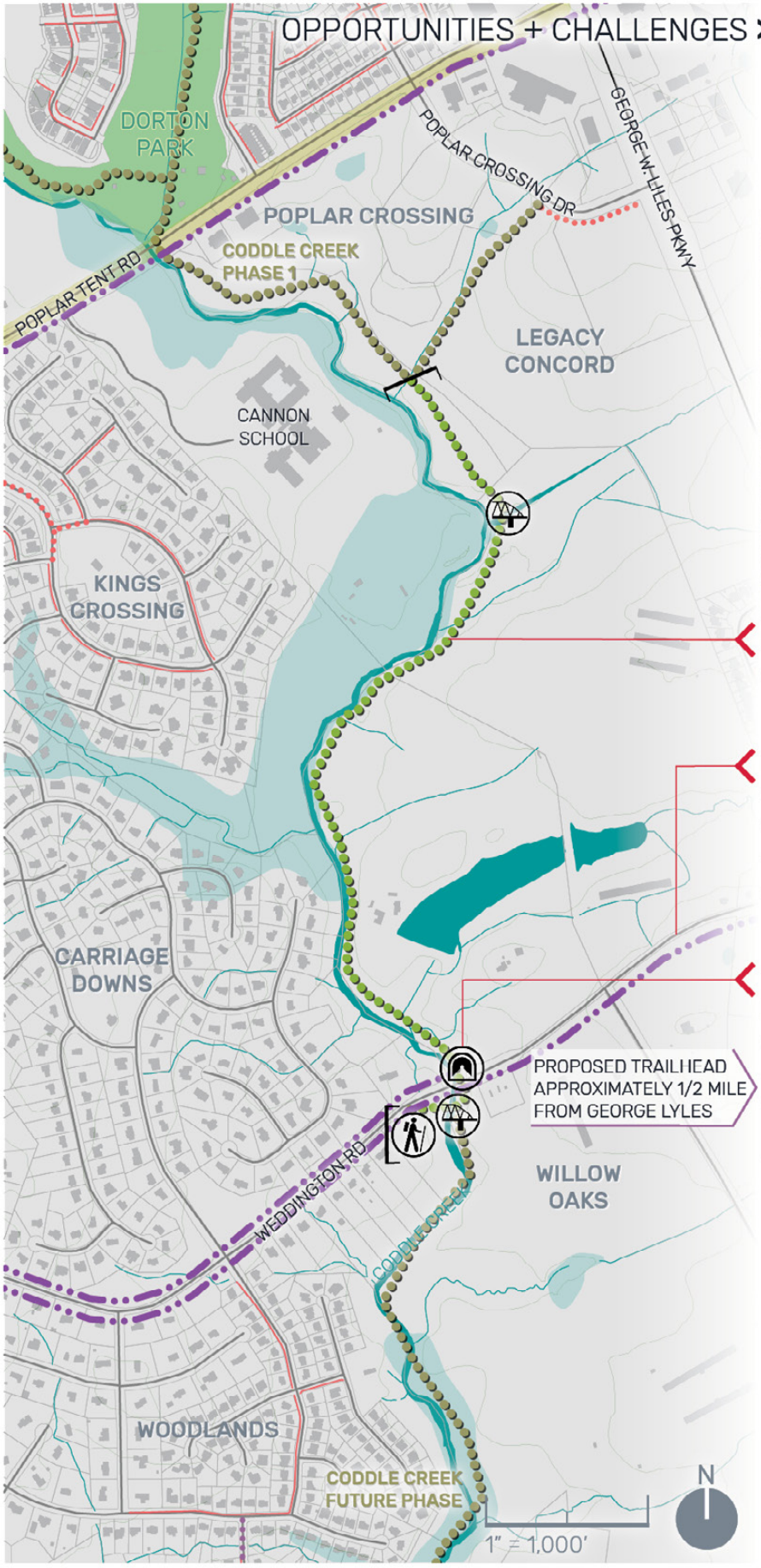
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 3,392,000.00
Escalated Construction Cost Estimate (FY2022):	$ 3,892,000.00
10% Contingency:	$ 390,000.00
Estimated Right of Way Costs:	$ 80,000.00
Estimated Design Services ±3% *adjust per project	$ 374,000.00
Estimated CEI Services ±2% *adjust per project	$ 390,000.00
Total Estimated Budget Recommendation:	**$ 5,126,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding – TAP, CMAQ
- City of Concord CIP funding
- Bonds

OPPORTUNITIES + CHALLENGES > CODDLE CREEK PHASE 2







Easement acquisition from property owners required to implement project.

Multi-use path connection along Weddington Road to cross George W. Liles Parkway to connect with the new high school and adjacent schools.

Vehicular bridge carries Weddington Road over Coddle Creek. Grade separation is possible

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

IRISH BUFFALO CREEK GREENWAY > PHASE 1

MELROSE DRIVE TO WARREN C. COLEMAN BLVD. (HWY. 601)

The section of Irish Buffalo Creek (IBC) Greenway between Melrose Drive and Warren C. Coleman Blvd (Hwy. 601) utilzes Marvin Caldwell Park as the anchor, eventually extending north to McGill Avenue with Phases 2 and 3 and south beyond NC-49, eventually tying into Rocky River Greenway Corridor with future phases. This first phase will solidify a trail corridor upon which the City can build, with the advantage of existing parking and facilities at Caldwell Park that serve as a trailhead. Property for an additional trailhead should be acquired along Warren C. Colman Boulevard. Irish Buffalo Creek Greenway Phase 1 will tie into proposed multi-use paths along Warren C. Coleman Blvd.

Project Snapshot

- Project Location: Between Caldwell Park (Logan Community) and Highway 601
- Project Type: Greenway
- Length of Project: 1.37 Miles
- Estimated Construction Year: 2020
- Trail Trip generators
  - Marvin Caldwell Park
  - Logan Multi-purpose Center
  - Logan Community

Previous Planning Efforts

- Carolina Thread Trail Master Plan – For Cabarrus County Communities (2009)
- Livable Community Blueprint for Cabarrus County (2001-2010)
- Concord Comprehensive Parks and Recreation Master Plan (2016)

Potential Right of Way Needs

- Total estimated area needed: 6.74 AC
- Number of impacted parcels (not City owned): 10
- Number of impacted property owners: 8

Potential Permitting Needs

- Erosion Control
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits
- 401/404 permitting

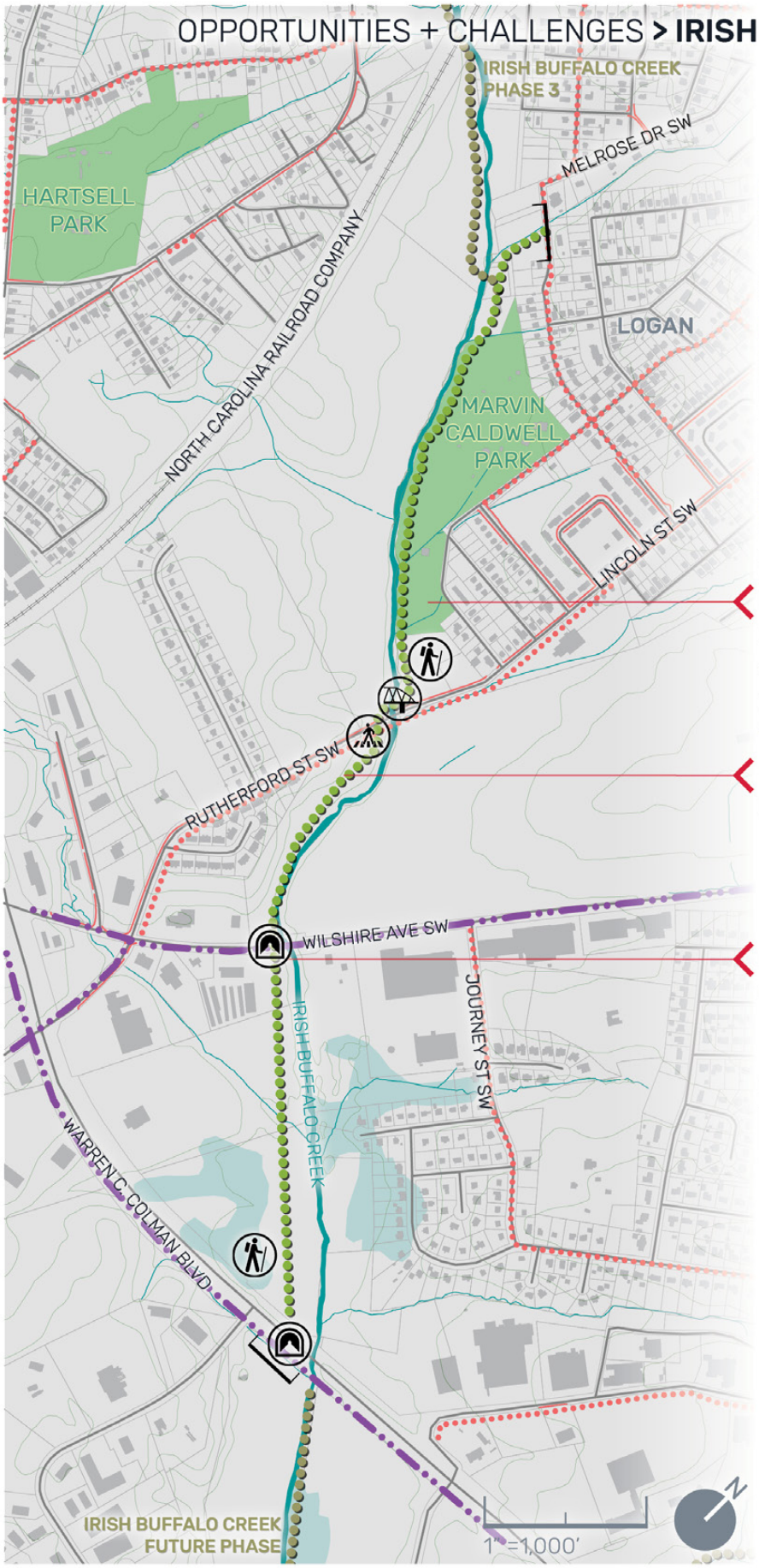
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 1,960,000.00
Escalated Construction Cost Estimate (FY2020):	$ 2,100,000.00
10% Contingency:	$ 210,000.00
Estimated Right of Way Costs:	$ 40,000.00
Estimated Design Services ±3% *adjust per project	$ 216,000.00
Estimated CEI Services ±2% *adjust per project	$ 210,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 2,776,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding – TAP, CMAQ
- City of Concord CIP funding
- Bonds
- Carolina Thread Trail Grant

OPPORTUNITIES + CHALLENGES > IRISH BUFFALO CREEK PHASE 1







Marvin Caldwell Park contains ball courts, trails, ball fields, an amphitheater, a playground, and plenty of shelters and flexible spaces along Irish Buffalo Creek.

Project will require FEMA floodplain modeling and permitting.

Design should investigate appropriate crossing of Wilshire Avenue.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

IRISH BUFFALO CREEK GREENWAY > PHASE 2

TRANSPORT PLACE TO MCGILL AVENUE - PART 1 OF GIBSON MILL LOOP

The second phase of Irish Buffalo Creek (IBC) Greenway is situated between Transport Place and McGill Avenue, following Stricker Branch NW behind the Depot, making up a portion of the Gibson Mill Loop. The route known as the Gibson Mill Loop will include bicycle/pedestrian facilities on Kerr Street and McGill Avenue, connecting to IBC Phase 2 (along Stricker Branch and Irish Buffalo Creek) and Cabarrus Avenue. Bicycle/pedestrian facilities along Cabarrus will tie back into Kerr St. creating a full loop. An alternative route of the Gibson Mill Loop bypasses Stricker Branch and continues along Irish Buffalo Creek to McGill Avenue. This alternative is represented in IBC Creek Greenway Phase 2A.

Project Snapshot

- Project Location: Between Cabarrus Avenue and McGill Avenue on the East side of Irish Buffalo Creek and along Stricker Branch
- Project Type: Greenway
- Length of Project: 1.29 Miles
- Estimated Construction Year: 2022
- Trail Trip generators
  - The Depot at Gibson Mill +Cabarrus Brewery
  - Gibson Field
  - MLK Memorial
  - Gibson Village
  - Logan Community
  - Downtown Concord
  - Academy Center
  - Hartsell Community Center

Previous Planning Efforts

- Carolina Thread Trail Master Plan – For Cabarrus County Communities (2009)
- Livable Community Blueprint for Cabarrus County (2001-2010)
- Concord Comprehensive Parks and Recreation Master Plan (2016)

Potential Right of Way Needs

- Total estimated area needed: 6.50 AC
- Number of impacted parcels (not City or County owned): 5
- Number of impacted property owners: 6

Potential Permitting Needs

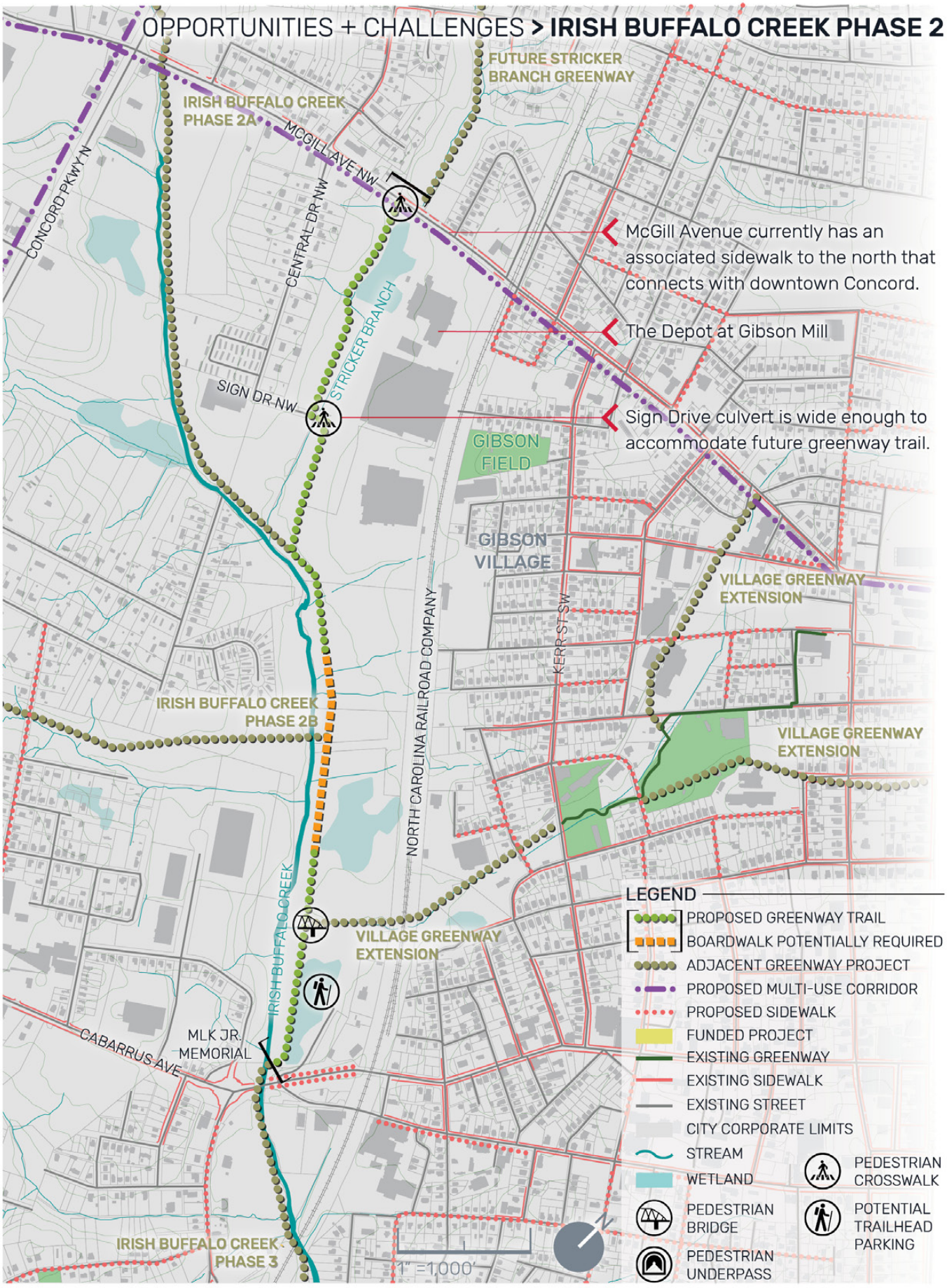
- Erosion Control
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits
- 401/404 permitting

Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 1,748,000.00
Escalated Construction Cost Estimate (FY2022):	$ 2,006,000.00
10% Contingency:	$ 201,000.00
Estimated Right of Way Costs:	$ 60,000.00
Estimated Design Services ±3% *adjust per project	$ 193,000.00
Estimated CEI Services ±2% *adjust per project	$ 201,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 2,661,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding–TAP, CMAQ
- City of Concord CIP funding
- Bonds
- Carolina Thread Trail Grant


OPPORTUNITIES + CHALLENGES > IRISH BUFFALO CREEK PHASE 2
FUTURE STRICKER BRANCH GREENWAY
IRISH BUFFALO CREEK PHASE 2A
MCGILL AVE NW
CONCORD PKWY N
CENTRAL DR NW
STRICKER BRANCH
SIGN DR NW
McGill Avenue currently has an associated sidewalk to the north that connects with downtown Concord.
The Depot at Gibson Mill
Sign Drive culvert is wide enough to accommodate future greenway trail.
GIBSON FIELD
GIBSON VILLAGE
VILLAGE GREENWAY EXTENSION
KERR ST SW
NORTH CAROLINA RAILROAD COMPANY
IRISH BUFFALO CREEK PHASE 2B
VILLAGE GREENWAY EXTENSION
IRISH BUFFALO CREEK
VILLAGE GREENWAY EXTENSION
MLK JR. MEMORIAL
CABARRUS AVE
IRISH BUFFALO CREEK PHASE 3
1" =1,000'
LEGEND
PROPOSED GREENWAY TRAIL
BOARDWALK POTENTIALLY REQUIRED
ADJACENT GREENWAY PROJECT
PROPOSED MULTI-USE CORRIDOR
PROPOSED SIDEWALK
FUNDED PROJECT
EXISTING GREENWAY
EXISTING SIDEWALK
EXISTING STREET
CITY CORPORATE LIMITS
STREAM
WETLAND
PEDESTRIAN CROSSWALK
PEDESTRIAN BRIDGE
POTENTIAL TRAILHEAD PARKING
PEDESTRIAN UNDERPASS

IRISH BUFFALO CREEK > **PHASE 2A**

This Phase of Irish Buffalo Creek is extending the IBC Greenway Phase 2 from the Depot warehouse district along the creek and under the McGill Avenue/Concord Pkwy (US-29) intersection. This section would provide a link up to and across US-29, setting up a further connection (IBC Phase 4) west under I-85 into Kannapolis at Vietnam Veterans Park. This section includes several bench modifications under McGill Avenue and US-29 roadway bridges that will require special attention but will provide a grade separated experience for trail users at a very busy and dangerous intersection.

Project Snapshot

- Project Location: Between main trail near the Depot and McGill Avenue at the US-29 intersection
- Project Type: Greenway
- Length of Project: 0.95 Miles
- Estimated Construction Year: 2029
- Trail Trip generators
  - The Depot
  - Gibson Field Park
  - Marvin Caldwell Park

Previous Planning Efforts

- Livable Community Blueprint for Cabarrus County (2001-2010)

Potential Right of Way Needs

- Total estimated area needed: 5.16 AC
- Number of impacted parcels (not City owned): 8
- Number of impacted property owners: 7

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

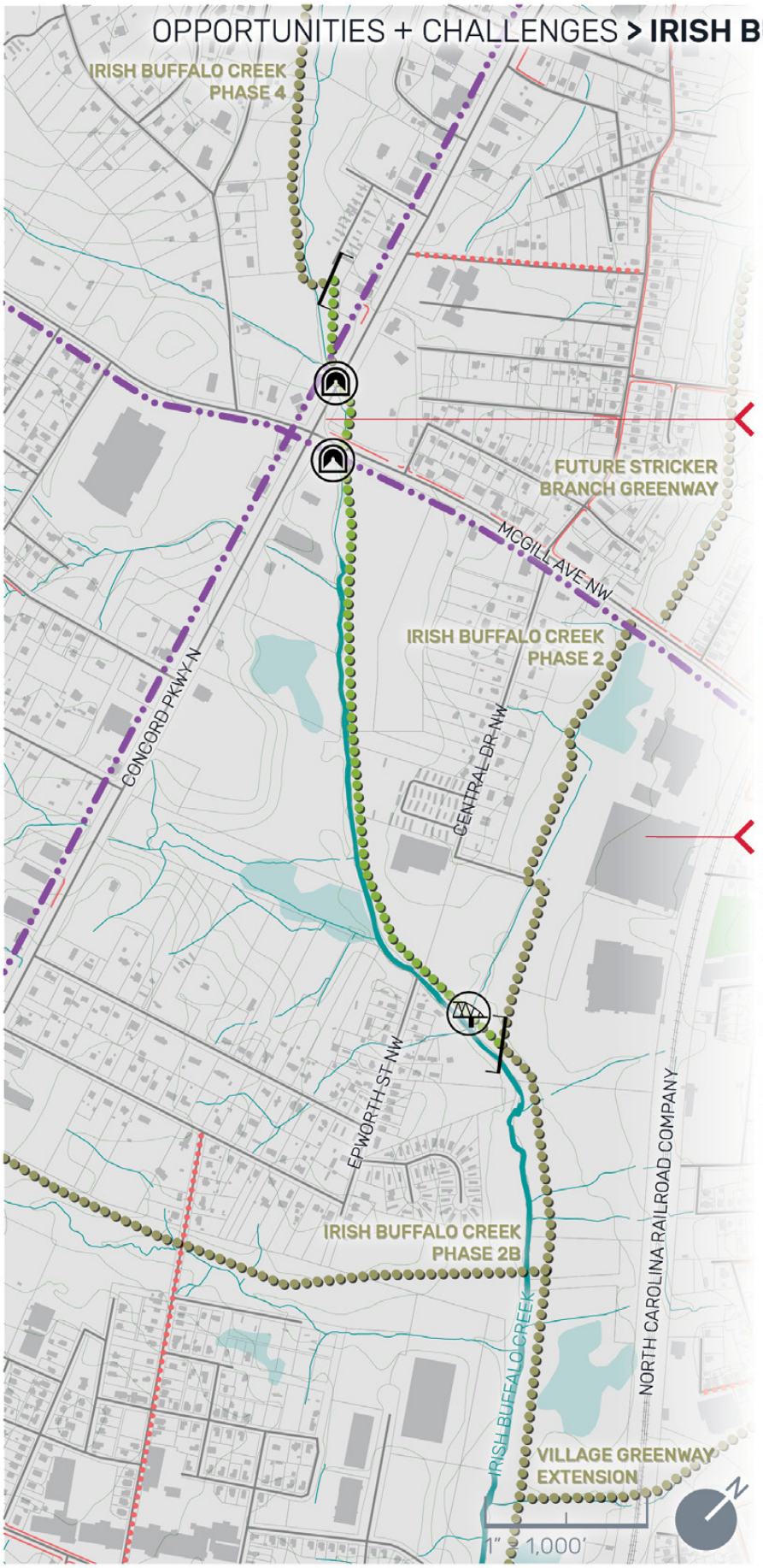
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 1,511,000.00
Escalated Construction Cost Estimate (FY2029):	$ 2,206,000.00
10% Contingency:	$ 221,000.00
Estimated Right of Way Costs:	$ 70,000.00
Estimated Design Services ±3% *adjust per project	$ 167,000.00
Estimated CEI Services ±2% *adjust per project	$ 221,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 2,885,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding

OPPORTUNITIES + CHALLENGES > IRISH BUFFALO CREEK PHASE 2A





Modify benches beneath McGill Avenue and Concord Parkway bridges to accommodate greenway trail.



The Depot at Gibson Mill is a commercial and social destination housed in a former bedding manufacturing plant. Included within the development are the Cabarrus and High Branch Brewing Companies and The Depot.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

IRISH BUFFALO CREEK > **PHASE 2B**

This Phase of Irish Buffalo Creek is a Y-Line off IBC Greenway Phase 2 from the Depot warehouse district across the creek and west to the Weddington Road extension. This phase will consist of greenway to Concord Pkwy. (US-601) and multi-use path along the anticipated Weddington Road extension. The multi-use path from US-601 to the Weddington extension would connect to the multi-use path along Weddington Road traveling west.

Project Snapshot

- Project Location: Between main trail near the Depot and Weddington Road
- Project Type: Greenway and Multi-Use Path
- Length of Project: 1.58 Miles
- Estimated Construction Year: 2029
- Trail Trip generators
  - The Depot at Gibson Mill
  - Gibson Field Park
  - Marvin Caldwell Park

Potential Right of Way Needs

- Total estimated area needed: 8.36 AC
- Number of impacted parcels (not City owned): 12
- Number of impacted property owners: 11

Potential Permitting Needs

- Erosion Control
- 401/404 permitting
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits

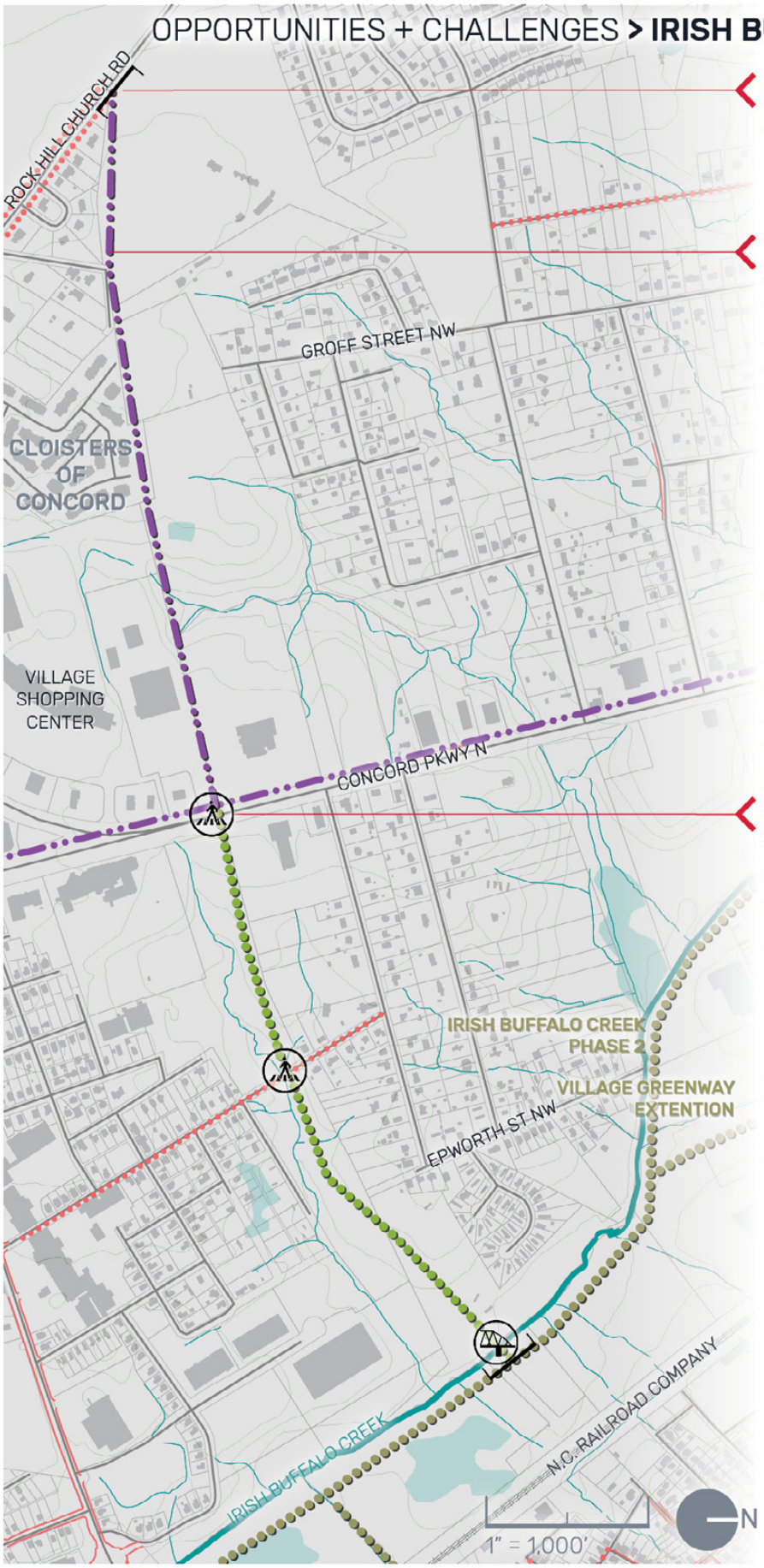
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 2,266,000.00
Escalated Construction Cost Estimate (FY2029):	$ 3,308,000.00
10% Contingency:	$ 331,000.00
Estimated Right of Way Costs:	$ 250,000.00
Estimated Design Services ±3% *adjust per project	$ 250,000.00
Estimated CEI Services ±2% *adjust per project	$ 331,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 4,470,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding

OPPORTUNITIES + CHALLENGES > IRISH BUFFALO CREEK PHASE 2B



Currently, Rock Hill Church Road does not have sidewalks

Proposed multi-use path follows future alignment of Weddington Road, a funded NCDOT project. Concord desires a multi-use path to be included in widening project.



Concord Parkway, a major thoroughfare creates challenging conditions for an at-grade pedestrian crossing. Signalized crosswalk recommended.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN CROSSWALK
- PEDESTRIAN BRIDGE
- POTENTIAL TRAILHEAD PARKING
- PEDESTRIAN UNDERPASS

IRISH BUFFALO CREEK > PHASE 3

TRANSPORT PLACE TO MELROSE DRIVE

The third phase of Irish Buffalo Creek Greenway links Phase 1 and 2 trails. This section will provide a final connection from the Depot down to Marvin Caldwell Park and will create a main corridor between many urban neighborhoods and great destinations; like the shopping and breweries at the Depot at Gibson Mill and recreation amenities. Coordination with NC Railroad (NCRR) and other operators on the rail line will be crucial for a successful project. The trail alignment crosses the creek at the western tip of Caldwell Park to avoid multiple property impacts and setting up a bench modification under the existing railroad bridge.

Project Snapshot

- Project Location: Between Cabarrus Avenue and Melrose Drive on the west side of Irish Buffalo Creek, including a railroad underpass
- Project Type: Greenway
- Length of Project: 0.60 Miles
- Estimated Construction Year: 2023
- Trail Trip generators
  - The Depot at Gibson Mill
  - Gibson Field
  - Marvin Caldwell Park
  - Hartsell Park
  - Logan Multi-purpose Center
  - Logan Community
  - Silver Hill Community
  - Gibson Village

Previous Planning Efforts

- Carolina Thread Trail Master Plan – For Cabarrus County Communities (2009)
- Livable Community Blueprint for Cabarrus County (2001-2010)
- Concord Comprehensive Parks and Recreation Master Plan (2016)

Potential Right of Way Needs

- Total estimated area needed: 2.80 AC
- Number of impacted parcels (not owned by City or County): 6
- Number of impacted property owners: 7

Potential Permitting Needs

- Erosion Control
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits
- 401/404 permitting
- Railroad inspection and flagging. Coordination with NCRR should begin as early as possible. The Railroad will require time and additional fees for review.

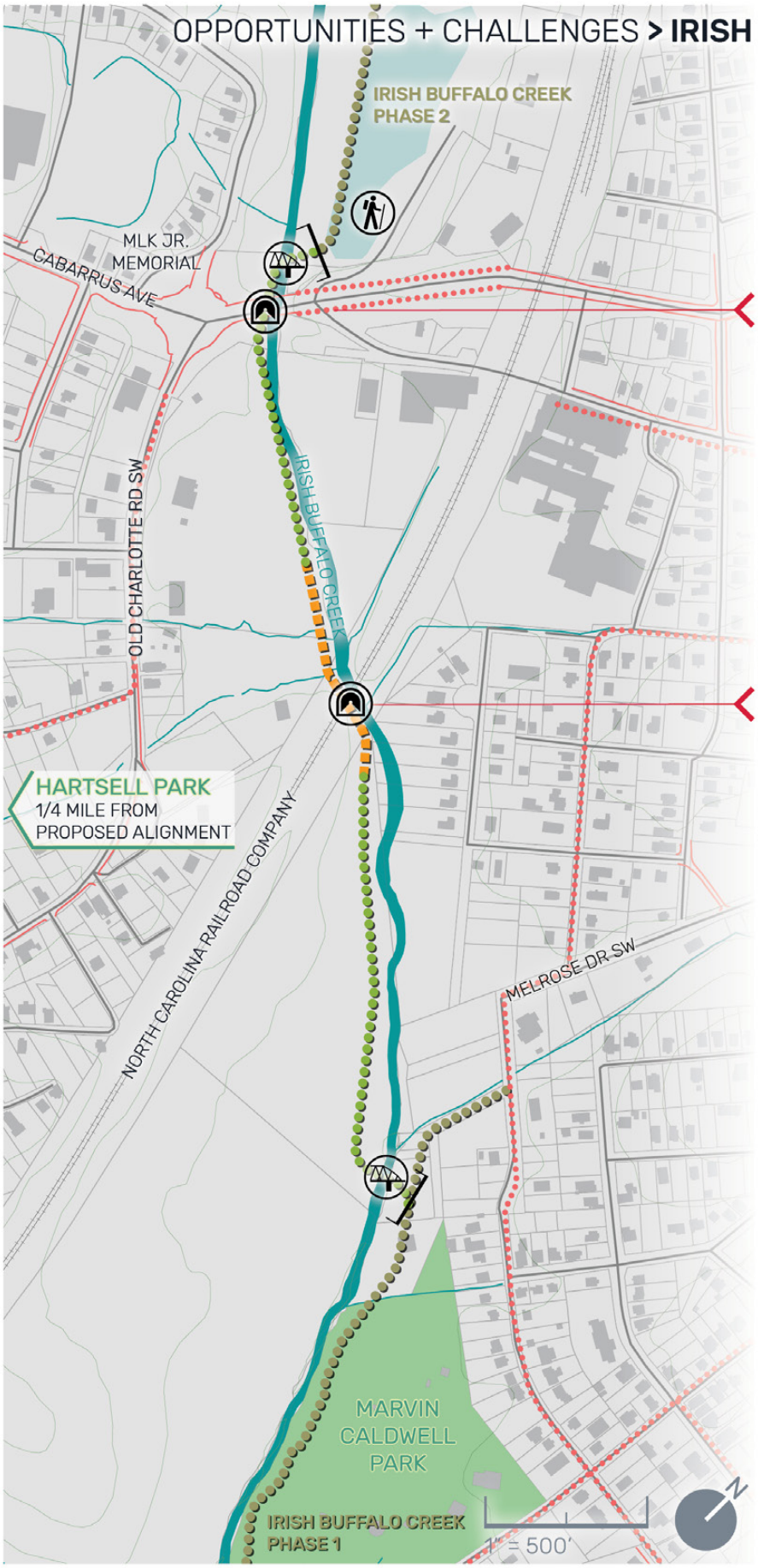
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 1,779,000.00
Escalated Construction Cost Estimate (FY2023):	$ 2,113,000.00
10% Contingency:	$ 212,000.00
Estimated Right of Way Costs:	$ 30,000.00
Estimated Design Services ±3% *adjust per project	$ 196,000.00
Estimated CEI Services ±2% *adjust per project	$ 212,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 2,763,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding–TAP, CMAQ
- City of Concord CIP funding
- Bonds
- Carolina Thread Trail Grant

OPPORTUNITIES + CHALLENGES > IRISH BUFFALO CREEK PHASE 3



Cabarrus Avenue has associated sidewalks west of Irish Buffalo Creek.



Existing railroad bridge creates opportunity to connect greenway on both sides of the tracks. Approaches to bench modification are complicated by grades and tributary crossings.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

IRISH BUFFALO CREEK > PHASE 4

CONCORD PARKWAY (US-29) TO VIETNAM VETERANS PARK, KANNAPOLIS

This phase of Irish Buffalo Creek travels along the west side of the creek from US-29, under Davidson Highway (US-73), under I-85, and terminating at Vietnam Veterans Park in Kannapolis. Connections to the proposed multi-use paths along Davidson Highway will provide additional connectivity to neighborhoods both east and west of the creek.

Project Snapshot

- Project Location: North of McGill Ave. across Hwy. 73 and under I-85 to Vietnam Veterans' Park in Kannapolis
- Project Type: Greenway
- Length of Project: 2.25 Miles
- Estimated Construction Year: 2024
- Trail Trip generators
  - Vietnam Veterans' Park (Kannapolis)

Previous Planning Efforts

- Livable Community Blueprint for Cabarrus County (2001-2010)

Potential Right of Way Needs

- Total estimated area needed: 11.8 AC
- Number of impacted parcels (not owned by City or County): 24
- Number of impacted property owners: 17

Potential Permitting Needs

- Erosion Control
- NCDOT Encroachments
- CLOMR/LOMR flood modeling permits
- 401/404 permitting

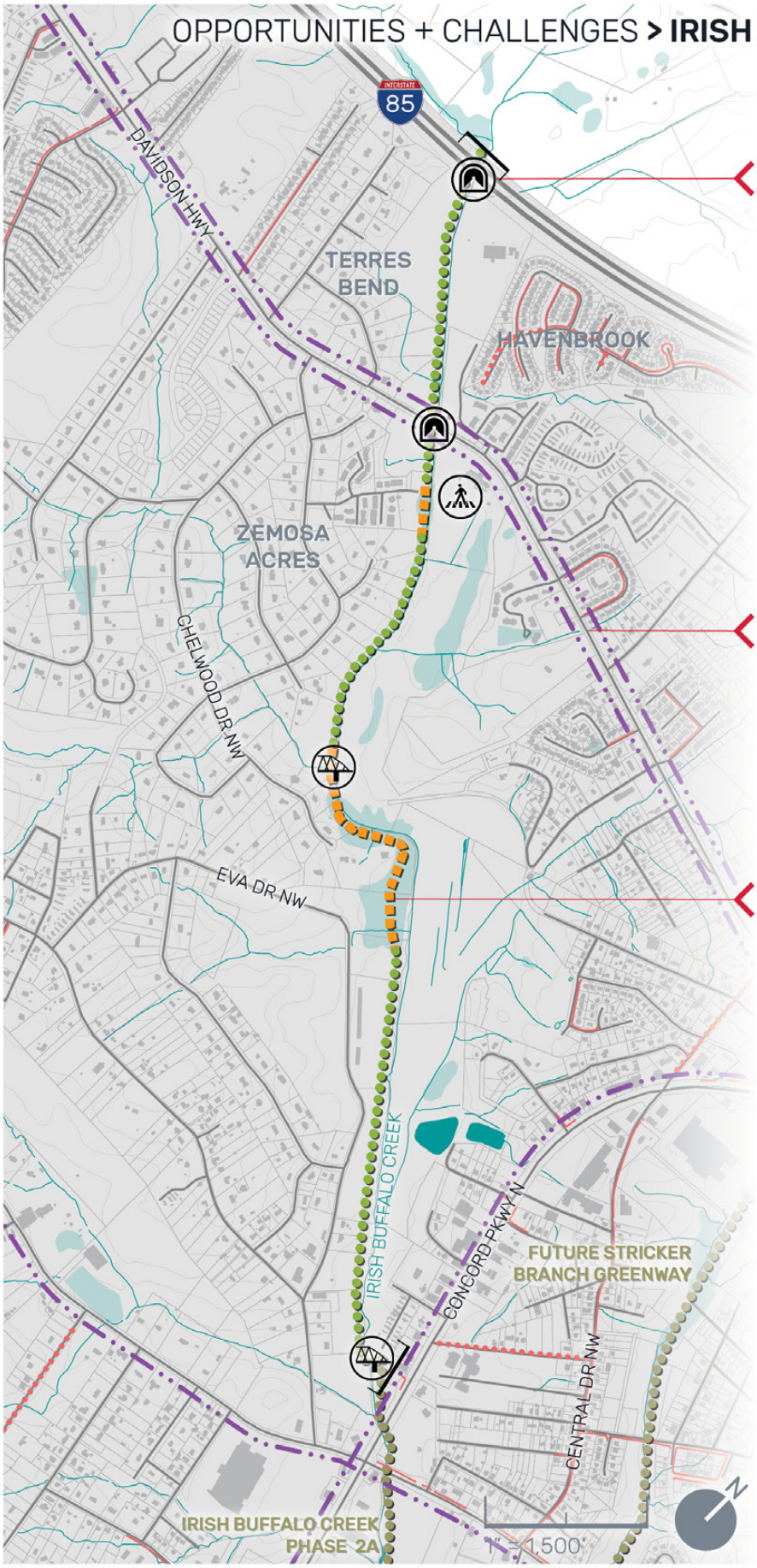
Estimated Project Cost

2019 Construction Cost Estimate (Basis for Calculations):	$ 3,928,000.00
Escalated Construction Cost Estimate (FY2023):	$ 4,828,000.00
10% Contingency:	$ 483,000.00
Estimated Right of Way Costs:	$ 110,000 .00
Estimated Design Services ±3% *adjust per project	$ 432,000.00
Estimated CEI Services ±2% *adjust per project	$ 483,000.00
TOTAL ESTIMATED BUDGET RECOMMENDATION:	**$ 6,336,000.00**

Potential Funding Sources

- CRMPO/LAPP funding
- NCDOT/STI funding
- City of Concord CIP funding

OPPORTUNITIES + CHALLENGES > IRISH BUFFALO CREEK PHASE 4



I-85 bridge over Irish Buffalo Creek allows greenway passage underneath.

NCDOT Project NC#73. City of Concord desires mulit-use path as part of widening project.

Construction of greenway trail through wetland will require permitting and elevated boardwalks where necessary.

LEGEND

- PROPOSED GREENWAY TRAIL
- BOARDWALK POTENTIALLY REQUIRED
- ADJACENT GREENWAY PROJECT
- PROPOSED MULTI-USE CORRIDOR
- PROPOSED SIDEWALK
- FUNDED PROJECT
- EXISTING GREENWAY
- EXISTING SIDEWALK
- EXISTING STREET
- CITY CORPORATE LIMITS
- STREAM
- WETLAND
- PEDESTRIAN BRIDGE
- PEDESTRIAN UNDERPASS
- PEDESTRIAN CROSSWALK
- POTENTIAL TRAILHEAD PARKING

SEGMENT	LENGTH (MILE)	ESTIMATED CONSTRUCTION YEAR	ROAD CROSSINGS # OF PED. CROSSWALKS	ROAD CROSSINGS # OF PED. UNDERPASS	# OF STREAM CROSSINGS	# OF IMPACTED PARCELS (NOT CITY OR COUNTY OWNED)	TOTAL COST ($)
HECTOR HENRY- PHASE 1	1.64	2021	1	1	3	10	**5,086,000.00**
HECTOR HENRY- PHASE 2	1.35	2023	0	1	2	5	**4,600,000.00**
HECTOR HENRY- PHASE 3	0.88	2034	0	1	0	7	**3,999,000.00**
HECTOR HENRY GOLF COURSE/ SPEEDWAY PHASE	3.10	2024	0	1	2	11	**9,947,000.00**
CLARKE CREEK- PHASE 1	1.81	2023	1	0	2	10	**4,103,000.00**
CLARKE CREEK- PHASE 2	2.04	2022	0	0	0	14	**5,991,000.00**
CLARKE CREEK- PHASE 3	1.05	2023	0	0	2	5	**2,909,000.00**
CODDLE CREEK- PHASE 1	2.2	2022	0	2	2	13	**4,100,000.00**
CODDLE CREEK- PHASE 2	1.09	2022	0	1	2	3	**5,126,000.00**
IRISH BUFFALO CREEK- PHASE 1	1.37	2020	1	1	1	10	**2,776,000.00**
IRISH BUFFALO CREEK- PHASE 2	1.29	2022	1	0	1	5	**2,661,000.00**
IRISH BUFFALO CREEK- PHASE 2A	0.95	2029	0	2	1	8	**2,885,000.00**
IRISH BUFFALO CREEK- PHASE 2B	1.58	2029	2	0	1	12	**4,470,000.00**
IRISH BUFFALO CREEK- PHASE 3	0.60	2023	0	2	2	6	**2,763,000.00**
IRISH BUFFALO CREEK- PHASE 4	2.25	2024	0	2	2	24	**6,336,000.00**

ACTION PLAN

The action plan outlines project priorities in a 5-10-15-year implementation plan. The action plan as provided is a guide and is meant to be flexible as needs change or as funding becomes available.

0-5YR PLAN (THROUGH FISCAL YEAR 2024)

1. Irish Buffalo Creek Greenway Phase 1
2. Hector Henry Greenway Phase 1
3. Irish Buffalo Creek Greenway Phase 2
4. Gibson Mill Loop – Develop a second loop trail system connecting Irish Buffalo Creek Greenway Phase 2, McGill Avenue, Kerr Street, and Cabarrus Avenue
5. Coddle Creek Greenway Phase 1
6. Coddle Creek Greenway Phase 2
7. Davidson Hwy (NC-73) – partner with NCDOT to construct multi-use path(s) as part of the NC-3 widening project
8. Clark Creek Greenway Phase 2
9. Harris Road multi-use corridor
10. Hector Henry Greenway Phase 2
11. Clarke Creek Greenway Phase 1
12. Clarke Creek Greenway Phase 3
13. Irish Buffalo Phase 3
14. Poplar Tent multi-use corridor
15. Bruton Smith Boulevard/Concord Mills Boulevard/Christenbury Parkway multi-use corridor
16. Irish Buffalo Phase 4
17. Hector Henry Greenway Golf Course/Speedway Phase

5-10YR PLAN (THROUGH FISCAL YEAR 2029)

1. Branchview Drive (NC-3) – partner with NCDOT to construct greenway and multi-use path as part of the NC-3 widening project
    - Harold B. McEachern Greenway – connect existing greenway north to Lake Concord Road
    - Multi-use path – connect existing greenway south from trailhead at Lawndale to Union Street
2. Lake Concord Road multi-use corridor
3. Cox Mill Road multi-use corridor
4. Church Street restriping to accommodate bicycle facilities
    - Coordinate with NCDOT
5. Downtown Greenway Loop Bicycle Improvements on:
    - Lawndale Ave.
    - Patton Ct.
    - Union St. South
    - Means Ave.
6. Wilshire Avenue – bicycle and pedestrian improvements from Rutherford to Union St.
7. Weddington Road/Rock Hill Church Road multi-use path
    - PH1: Coddle Creek bridge to Concord Pkwy (NC-29)
    - PH2: Bark Park to Coddle Creek
8. George W. Liles Parkway/Roberta Church Road/Stough Road multi-use corridor
9. Irish Buffalo Phase 2A
10. Irish Buffalo Phase 2B

10-15YR PLAN (THROUGH FISCAL YEAR 2034)

1. Pitts School Road multi-use corridor
2. Warren C. Coleman Boulevard (NC-601) multi-use corridor
3. Old Charlotte Road multi-use corridor
4. Roberta Road multi-use corridor
5. Zion Church Road/Lincoln Street multi-use corridor
6. Flowe Store Road multi-use corridor
7. Miami Church Road multi-use corridor
8. Cold Springs Road multi-use corridor
9. Hector Henry Greenway Phase 3



ADDITIONAL SYSTEM RECOMMENDATIONS

This plan recommends that Concord partner and coordinate with NCDOT to implement multi-use corridors along state roads (e.g. Poplar Tent Road, Davidson Highway (NC-73), and Weddington Road) to provide linkages throughout the City and providing opportunities to accommodate pedestrians and cyclists, further advancing the City's multi-modal transportation network. Continue to seek incorporation of bicycle/pedestrian/Complete Streets elements as part of NCDOT projects.

Concord must keep open the lines of communication with surrounding jurisdictions and their respective Metropolitan Planning Organizations (MPO), including them in conversations as bicycle/pedestrian projects arise with the opportunity to connect across the City borders.

City Departments should continue coordination efforts, especially on unified street cross sections and ordinance amendments to avoid redundancy, confusion, and inefficiency.

To help answer critical planning questions, it is recommended to have corridor and feasibility studies as described in Chapter 6 prepared for priority corridors. These studies will assess the practicality of the proposed project and guide decisions that shape project scope and budget. Recommended corridor and feasibility studies may include:

- Irish Buffalo Creek to Concord Parkway (NC-601)
- Stricker Branch
- Hospital to Davidson Highway (NC-73)
- Clark Creek Parkway

When possible, dovetail the construction of bicycle and pedestrian facilities into identified future projects such as the development of new parks and school facilities as well as renovations and improvements to existing parks or schools.

Develop an ADA Transition Plan to address non-compliant issues, pinpointing facilities, programs, and services that must be modified to comply with ADA requirements.

With all the proposed development of new greenways, Concord must continue to maintain and enhance existing greenways. Some additional amenities that should be incorporated into existing greenways include:

- Bike share stations at trailheads
- Wayfinding signage, maps, and distance markers on the trails to help orient patrons and direct them to popular destinations within the greenway network
- Public art (either temporary or permanent) by both local and nationally recognized artists
- Emergency communication system and location markers to connect with security or emergency responders

In addition to paved bike trails, the City should look for opportunities to develop mountain bike trails. There is a demand for these facilities based on input received at the public workshops and in stakeholder interviews. Currently there are no public mountain bike trails in Concord, but there is a privately held mountain biking trail off Parks Laferty Road (west of NC-601) known as Rocky River Trail. There is also discussion of donating a parcel on the east side of Warren C. Coleman Blvd to the City for development of a mountain biking trail.

8 implementation strategy





CHAPTER 8 > IMPLEMENTATION STRATEGY

While the network plan provides an overall framework for development of various types of trails and the approximate routes, it is by no means construction-ready. As a living document, the network plan and priorities may evolve with changing development pressures, funding opportunities, and demographic trends. Further, the County will need to undertake more detailed corridor and feasibility studies to "ground-proof" each trail corridor. This typically includes a detailed evaluation of land / easement acquisition potential, topography, stream or road crossings, grading and drainage patterns, safety, user experience, long-term maintenance, and regulatory requirements. With this more detailed layer of information, detailed design decisions such as trail surface and profile, width, markings, signage, furnishings, and crossings can be finalized. Only after this detailed assessment can a final trail alignment be determined. The below diagram illustrates a typical greenway planning, design and construction process with key phases and individual tasks. Next steps will be for the City to undertake individual Corridor Studies followed by Feasibility Studies and finally, Project Design.

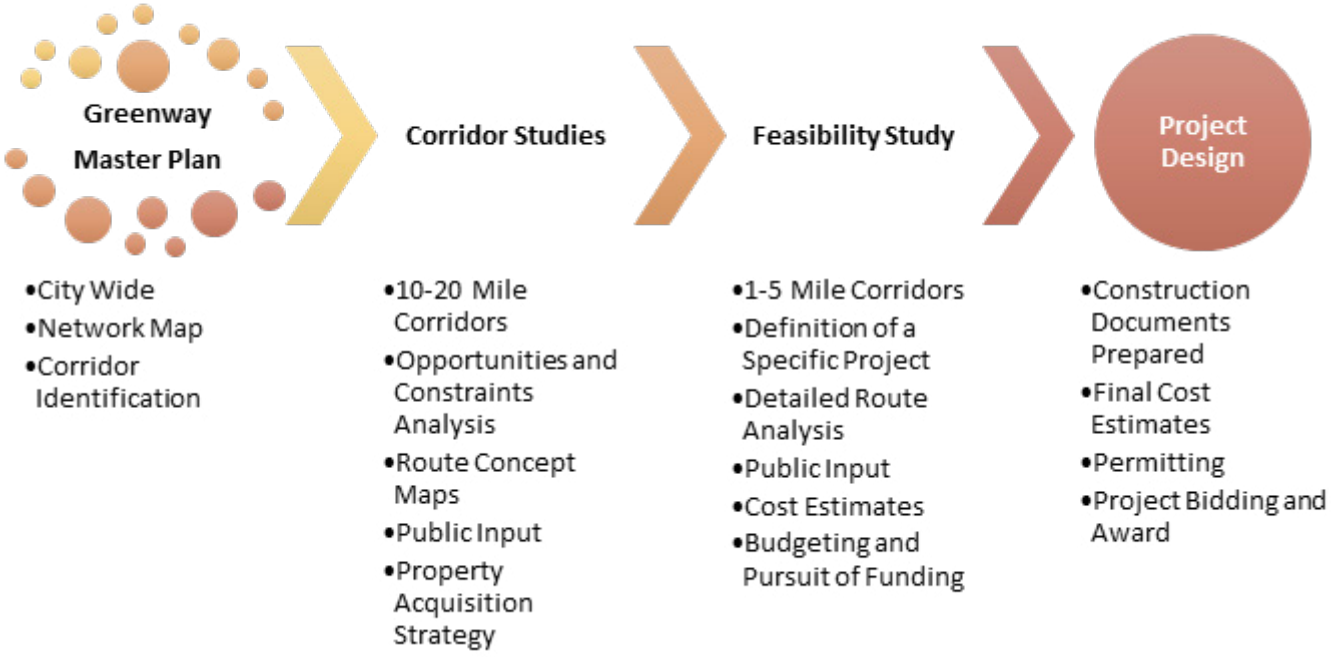


Figure 1 - Greenway trail planning, design and construction process and sequencing.

Successful implementation of the bicycle and pedestrian connectivity plan will require a coordinated effort of many parties working together. These agencies include County and City departments as well as NCDOT and Federal Affiliations. Private sector organizations may also prove beneficial, as they may have the influence and capacity to garner additional community support for establishment of the bicycle/ pedestrian network.

LAND ACQUISITION STRATEGIES

Acquiring land and/or right of way will be one of the most important objectives for Concord to realize a more robust, connected pedestrian and bicycle network. In order to obtain the property necessary for easements, trailheads, and other open space in conjunction with the connectivity network, and to move quickly as land acquisition opportunities arise, it is recommended that the City either contract with a real estate group or appoint an employee that is dedicated to property acquisition for the sole purpose of expanding the network. There are several methods of land acquisition that Concord may explore including:

FEE SIMPLE PURCHASE

While often the most expensive means of obtaining a property, a fee simple purchase is likely the most widely used method of procuring land. When utilizing a fee simple purchase, the land is purchased outright, conveying the full land title and property rights the land possesses. This method has the advantage of being rather simple to administer and to explain to the general public when having to justify an expense.

EASEMENT PURCHASE

An easement purchase acquisition is the fee simple purchase of only an easement. Full title to the land is not obtained, rather only those rights granted within the easement agreement. Considering that the full title and rights are not acquired, the easement purchase price is less that of the full title value.

FEE SIMPLE PURCHASE WITH LEASE-BACK OR RESALE

This technique of land acquisition enables a local government agency to purchase a piece of land and then lease or sell it back to a prospective user with deed restrictions that would protect the land from abuse or development. This method is typically used when governments impose development restrictions severe enough that the land owner considers a major portion of the property's value lost due to restrictions and is therefore more economical for him to sell with a leaseback option. This lease may contain restrictions regarding the development and use of the property.

LONG-TERM OPTION

When a property is considered to have potential future value though purchasing said property is not desired or affordable at the time, a long-term option can be used as a land acquisition method. Under the terms of a long-term option, the City agrees with the landowner on a purchase price for the property and a time period over which the City has the right to exercise its option. The use of this protective method may stabilize escalating land cost, establish land use for the property, and does not require the City to expend large sums of money until the land is purchased. However, the disadvantage of a long-term option is that a price must be paid for every right given by the property owner.

FIRST RIGHT OF PURCHASE (OFFER, NEGOTIATION AND REFUSAL)

This approach eliminates the need for fixing the selling price but establishes an agreement between the City and the seller that states the City shall be notified of any imminent purchase of a specific parcel. If a purchase is pending, the City would have the right to purchase said property prior to it being sold to the interested party or have the right of first refusal.

LAND TRUST

A Land Trust is a 501 (c) (3) not-for-profit corporation made up of knowledgeable stakeholders representing a cross section of recreation, historic preservation, conservation, land development, and environmental interests and experiences. The role and responsibility of a Land Trust is to acquire open space and/or park land while maintaining a well-balanced system of ecological, scenic, recreational, and historical park resources and to work with landowners to acquire park land for current and future generations. In lieu of creating a new Land Trust, the City can partner with The Land Trust for Central North Carolina and/or the Catawba Lands Conservancy. And it is recommended that the City seek out an experienced land acquisition attorney to provide the ideal combination of processes to acquire the right mix of land types to meet the City's goals.

DONATIONS

An often-untapped funding source for land acquisition is land donations. The City may seek to obtain a land donation in conjunction with a PARTF grant application, thereby providing all or the majority of the required local match. In this type of acquisition, a government body or public agency agrees to receive from the donor the full title of or a conservation easement to a parcel of land at either no cost or at a "bargain sale" rate. The donor is then eligible to receive various federal and state tax deduction or credits. Details of donations tax benefits should be confirmed with a qualified tax advisor.

To aid in the receipt of such donations, some agencies have developed a gift catalog to promote a gifts program. The catalog should:

- be prepared and distributed effectively and inexpensively
- explain the gifts program's role and importance and provide a clear statement of needs
- describe the advantages (e.g. tax advantages),
- identify various gifts (land, labor, materials, etc.) that are needed
- identify typical costs associated with these gifts, and
- be made readily available to the public.

Communicating with the local Bar Association, trust departments of lending institutions, and the Probate Court to make individuals aware of the possibility to include a gift to the City as part of their tax and estate planning is a strategy to connect potential donors (individuals, businesses, foundations, service clubs, etc.) to the City.

LIFE ESTATE

Under this plan, a donor maintains use of his land during his lifetime but relinquishes the title to said land upon his death. In return, the land owner is typically relieved of the property tax burden on the donated land. It is essentially a deferred gift.

EASEMENT

If property ownership is viewed as a combination of rights, it is then possible to purchase any one or several of these rights. In acquisition of an easement, the City would seek either to compensate the land owner for the right to use the land in some fashion or to compensate him for the loss of one of his land use privileges. One advantage of this method is that the land owner continues to use the land while the land remains on the tax records, thus maintaining it as a source of revenue for the City. But perhaps the greatest benefit is that the City purchases only those rights that it specifically needs and by purchasing only rights that are needed, the City is making more efficient use of its financial resources.

Another way to utilize easement acquisition to work across municipal departments to negotiate trail access and rights whenever public easements of any kind are acquired. While this route may require a higher level of coordination, it removes the need to renegotiate adding trail access rights to water, sewer, drainage and right of way easements in the future.

ZONING/SUBDIVISION REGULATIONS

Many communities have zoning ordinances and subdivision regulations that require developers to dedicate a portion of the developed property for open space or recreational use. Local governments can request, require and/or offer incentives for open space set aside or for a portion of a trail corridor to be developed as part of the subdivision approval process. Subdivision requirements must include language such that the permitting agency has the authority to review and approve land dedicated as public open space or for recreational use to assure it is usable for such purposes.

Likewise, dedication ordinances should have a provision for payment in lieu of land dedication to eliminate the possibility of acquiring property too small to provide public open space or recreation benefits or land unsuitable for recreational development. Additionally, development regulations can be adopted that create building restrictions and dedication requirements such as buffers and setbacks from perennial streams and flood plain development restrictions.

BARGAIN SALE

Sometimes a property owner will sell property at a lower price than the appraised fair market value, thereby deriving the same benefits of property donation. Bargain Sale is attractive to sellers when the seller initially paid a low cash price for the land and thus is not liable for high capital gains tax, the seller wants cash for the property, and/or the seller has a high income and could benefit from the tax deduction.

INSTALLMENT SALE

An installment sale provides an attractive option when purchasing land for open space. An installment sale is the sale of a property at a gain where at least one payment shall be received after the tax year in which the sale occurs. This helps the seller defer capital gains tax.

PURCHASE OF DEVELOPMENT RIGHTS

A voluntary purchase of development rights is the purchase of the development rights from a private land owner at a fair market value. The land owner retains all ownership rights but exchanges the rights to develop the property for cash payment.

LAND BANKING

Land banking is acquiring land in order to preserve key open spaces for future recreation use prior to impending urbanization or development. The price of an open space parcel prior to development pressures is typically more affordable than after those pressures have surfaced.

CONDEMNATION

Condemning private land for use as a greenway is typically a last resort policy. If private and public support for greenway expansion is present, using condemnation to acquire property or property rights should be avoided. Condemnation is seldom used for the purpose of dealing with an unwilling property owner but rather is exercised when there is absentee property ownership, when the title of the property is not clear, or if obtaining purchase consent proves too difficult because of numerous heirs scattered throughout United States and/or abroad.

POLICY GUIDANCE

As mentioned in Chapter 3, the Concord Development Ordinance (CDO) contains limited usage of the term "greenway". Article 10 - Development and Design Standards specifically addresses greenways, trails, and sidewalks as well as park and open space lands with regards to development within the City. While the language contained within the land development ordinance helps the City meet the challenge of providing the recreational needs of its population as it continues to grow, the current policy should be modified to address greenway dedications necessary to complete the greenway network and reference the Open Space Connectivity Analysis for future land dedication.

Since development of trails and greenways are a high priority for Concord residents, strengthened language should be added to detail how land may be dedicated for greenways in the future. The policy should address both residential and commercial land uses where future greenways are proposed. Considering that commercial areas made up a large part of residents' desired pedestrian and bicycle connected destinations, the City should evaluate commercial site design requirements to include comprehensive trail connections and support facilities.

As a by-product of trail connections, linkages between key destinations like residential communities, business parks, commercial centers, schools, and parks help strengthen the City's transportation needs. Concord should continue to work with state, regional, and local agencies to advance the development of greenway and multi-use corridors and on-street connections that are part of the City's recreation and transportation vision.

With the CDO encouraging compliance to the Complete Streets Initiative, it is recommended to modify required development and street design standards to comply with Complete Streets. Doing so ensures that the varied needs of drivers, public transportation vehicles and patrons, and pedestrians and bicyclists of all ages and abilities are provided for in planning, programming, design, construction, and operations and maintenance. To further implementation of Complete Streets Initiative throughout the City, a Complete Streets design review should be included for all routine maintenance projects (e.g. paving and restriping), as well as all other utility work that disturbs streets. This strategy could provide many opportunities for low-or no-cost Complete Streets improvements.

DEVELOPER DEDICATION OF ROW AND CONSTRUCTION

Regarding developer dedication of right-of way and trail construction, the CDO should expand developer requirements to include the construction or easement dedication of greenways and bicycle/ pedestrian infrastructure as part of the required elements for subdivision development. The Planning and Community Development Department, through the subdivision and development permit review process, must insist developers preserve the corridors identified in this analysis for trail connection. They may also suggest that developers construct specific sections of the routes through their developments. The City should also continue working with developers to dedicate important open space that provides trail connectivity and water quality and wildlife habitat protection.

UTILITY EASEMENTS

It is recommended that the City pursue dedication of trail easements in conjunction with utility easements. Early coordination is necessary to determine and document requirements for boardwalks, bridges, other structures in the easement.

General rules of thumb when developing trails within a utility easement include:

- Provide 4-feet minimum distance from the edges of paved trails to the edge of raised manholes,
- Provide 2-feet minimum distance from the trail edge to utility surface covers/plates (e.g. waterline valve covers, blowoffs, manholes, utility handholds, etc). The surface covers/plate must not be located in the trail.
- Provide 15-feet minimum distance from boardwalk structures to the center of all existing sewer lines. Boardwalk structures shall be located outside of sanitary sewer easements over waterways.
- Provide 15-feet minimum distance from bridges and abutments to center of all existing sewer lines. Bridges and abutments shall be located outside of sanitary sewer easements over waterways.

Concord's Water Resources Department, in conjunction with the Parks and Recreation Department, should continually investigate opportunities to incorporate bicycle and pedestrian access along new and existing rights-of-way and easements where the easements or rights-of-way correspond with the corridor locations shown on the Overall Network Map. Since public utilities access virtually all destinations, the City should develop a public access component to all new and existing public utility rights-of-way.

ADDITIONAL POLICY CONSIDERATIONS

- Create and fund a new connectivity program separate from the existing Pedestrian Improvement Program (PIP) managed by Transportation that will fund the construction of bike lanes, multi-use paths, sidewalks and crosswalks.
- Participate in any future planning efforts between adjacent jurisdictions to coordinate possible connections and share valuable information. Continue to coordinate with Cabarrus County, Kannapolis, Harrisburg, and Charlotte/Mecklenburg County to link to their trail systems.
- The City should support the development of the pedestrian/bicycle routes when those projects can dovetail with capital improvement projects that improve transportation, utility or other infrastructure projects.
- Evaluate development review procedures and water management regulations that encourage incorporation of innovative storm water management techniques that include opportunities to integrate outdoor facilities (e.g. greenways) with neighborhood storm water detention facilities. Doing so helps create wildlife habitat and recreation space. However, the need for additional land can be a barrier to making multifunctional storm water detention areas. As such, incentives for this approach may be necessary.
- Pair greenway development and land acquisition with stream restoration and conservation efforts when possible. Greenway and stream restoration projects complement each other and often can increase grant funding opportunities.
- The City of Concord Parks and Recreation Department has the role of connecting to the system through their facilities. Design plans for each new or improved park should reference the open space connectivity analysis and develop, where appropriate, paths to, from, and through individual parks to connect the community to overall network.
- All new school facilities should connect to surrounding neighborhoods, with the CDO requiring new residential development adjacent to schools to provide connections to school property. Existing facilities should investigate the opportunity to connect with the city-wide bicycle/pedestrian corridors and where appropriate, the schools should connect to routes identified in this plan.
- On projects that would normally require a Traffic Impact Analysis (TIA), instead require a Multi-Modal Transportation Analysis (MMTA). A Multi-Modal analysis results in an estimate of not just motor vehicles, but best-case pedestrian, bicycle, and transit trips associated with new or redevelopment. The analysis report then provides recommendation for appropriate remediation.
- The Transportation Department should coordinate public transit stops with park and trail entrances.
- Continue to coordinate with the recently established Connectivity Committee in the planning and design of multi-use trails, sidewalks, and on road bike facilities. This committee is also primed to coordinate on bicycle and pedestrian facility design, funding, construction, and maintenance to develop an integrated approach to budgeting, especially where project boundaries and responsibilities overlap.
- The City previously determined to utilize wide outside lanes as a general policy when engineering a new roadway. It is recommended that this general policy be evaluated and modified such that pedestrian and bicycle facilities are more prominent in the design solution.
- With significant growth of the City's greenway network, Building and Grounds Department should review their current maintenance standards to determine an appropriate level of maintenance for each segment and to accommodate the preferred maintenance level for additional trail mileage into the budget.

PRIORITIZATION STRATEGIES

The Open Space Connectivity Analysis was developed to designate corridors for public bicycle and pedestrian access and development of the overall connectivity network will take a commitment from all City departments. With numerous greenway and multi-use corridors identified, it becomes imperative to prioritize their development.

Top priority projects want to be successful. It is important that initial projects be completed smoothly, rapidly, and cost effectively without incident or controversy. Their success encourages the community to continue providing support for additional projects.

In order to develop the future connectivity system in an efficient manner, each trail segment needs to be evaluated and prioritized. Potential criteria to begin evaluation may include that they:

- Proximity to Population
  - Trail segments need to be near or within populated areas to provide the most benefit possible to as residents in the form of health and wellness activities, recreation, and transportation.
- Available Land / Right-of-Way
  - An assessment must be made for trail segments to determine where land or right-of-way is required and if available land can support future trail development.
- Ease of Development
  - Trail segments must be evaluated to understand any obstacles that may exist to trail development, (e.g. environmental permits).
- Available Funding
  - An assessment must be made regarding how each trail segment will be funded and whether that segment is economically feasible to construct. If a project is "shovel ready", that trail is in a better position to receive State and/or Federal funding.

Other considerations may include:

- Consistency with City goals
- Opportunity to link neighborhood to neighborhood
- The option to dovetail design and construction with other improvement projects
- Providing the solution to an existing problem or areas of concern
- Linking schools, parks and residential areas
- Project visibility and accessibility

The evaluation and prioritization of projects should be completed on an annual basis, realizing that a flexible and pragmatic approach is needed to take advantage of unexpected opportunities where greenway and multi-use corridor development can come to fruition.

FUNDING STRATEGIES

Next to land acquisition, funding is the most difficult step in the process. Below are several funding sources that can be tapped to provide the necessary dollars to plan, design, and/or construct the connectivity network. The following sources of funding have been instrumental in the successful development of bicycle and pedestrian networks in other North Carolina communities.

FEDERAL FUNDING

Federal Transportation Funding - Many North Carolina communities have partnered with the Federal Highway Administration to build multi-use paths, greenways, sidewalks, bike-lanes and improve crossings. Each of these programs is administered by NCDOT through the Locally Administered Projects Program (LAPP). Communities wishing to access Federal Funding must submit their candidate projects to their MPO or RPO so that the project can be entered into the Strategic Transportation Investment Mobility Formula. This formula ranks projects and identifies those to be funded in the State Transportation Improvement Program (STIP). These funds require a 20% match from the locality.

The **Transportation Alternatives Program** provides federal funds for community-based projects that expand travel choices and enhance the transportation experience by integrating modes and improving the cultural, historic, and environmental aspects of our transportation infrastructure. Projects types include:

- on-road and off-road pedestrian and bicycle facilities
- infrastructure projects for improving non-driver access to public transportation and enhanced mobility
- community improvement activities
- environmental mitigation
- safe routes to school projects
- streetscape improvements
- refurbishment of historic transportation facilities
- other investments that enhance communities

Congestion Mitigation & Air Quality in North Carolina - Congestion Mitigation & Air Quality (CMAQ) is a Federal program that funds transportation projects and programs in air quality nonattainment and maintenance areas to help achieve and maintain national standards for air quality pollutants. In North Carolina, NCDOT serves as the administrator for this program. Funding is apportioned to North Carolina based on the population in non-attainment and maintenance areas of the state and the severity of air quality problem. NC's allocation of CMAQ funding is split in three pots available for funding, as follows:

- Statewide CMAQ funds are administered by NCDOT and are awarded to prioritized NCDOT-driven CMAQ eligible projects either on a statewide tier facility or involving a system wide improvement within nonattainment and maintenance areas. Statewide CMAQ funds are not subject to regional or subregional allocations or the allocation formula. This category accounts for 35% of the total North Carolina CMAQ apportionment.
- Regional CMAQ funds are locally-administered and awarded to projects spanning more than one air quality region that cannot be considered subregional projects. Air quality regions are Catawba, Great Smoky Mountains National Park, Metrolina, Rocky Mount, Triad and Triangle. The local project sponsor is responsible for providing the required match. This category accounts for 5% of the total North Carolina CMAQ apportionment.
- Subregional CMAQ funds are locally-administered and awarded at the MPO/RPO level to projects within eligible counties. The local project sponsor is responsible for providing the required match and meeting federal funding requirements. This category accounts for 60% of the total North Carolina CMAQ apportionment. This is the category that most likely be used for City of Concord Projects.

Recreational Trails Program (RTP) - The intent of the RTP is to help fund trails and trail-related recreational needs at the State level. Funding for the RTP comes from federal gas taxes paid on non-highway fuel used in off-highway vehicles. The program is administered at the Federal level by the Federal Highway Administration. Grants range from $10,000 - $100,000 and require a 25% match by the locality.[1]

Approved Uses:

- New Trail/Greenway Construction
- Trail/Greenway Renovation
- Approved Trail/Greenway Facilities & Trail Head/Trail Markers
- Purchase of Tools to Construct &/or Renovate
- Trail/ Greenway Land Acquisition for Trail Purposes
- Planning, Legal, Environmental, and Permitting Costs - up to 10% of grant amount
- Combination of the Above

Community Development Block Grant (CDBG) program is a flexible program that provides communities with resources to address a wide range of unique community development needs. Beginning in 1974, the CDBG program is one of the longest continuously run programs at HUD. The CDBG program provides annual grants on a formula basis to 1,209 general units of local government and States. Over a 1, 2, or 3-year period, as selected by the grantee, not less than 70 percent of CDBG funds must be used for activities that benefit low- and moderate-income persons. In addition, each activity must meet one of the following national objectives for the program: benefit low- and moderate-income persons, prevention or elimination of slums or blight, or address community development needs having a particular urgency because existing conditions pose a serious and immediate threat to the health or welfare of the community for which other funding is not available. In the past, several communities have used CDBG funds to construct greenways, as greenways are part of a community's economic development as well as recreational facilities that serve to improve the quality of life.

STATE FUNDING

State Transportation Funding

Independent Bicycle & Pedestrian Facilities - Historical state funding has been a critical component in funding independent bicycle and pedestrian projects, including the 34-mile-long Neuse River Greenway, early sections of Little Sugar Creek Greenway and many more. The 2013 Strategic Transportation Investment Law prohibited state investment in stand-alone or independent bicycle and pedestrian facilities. Currently there are no state transportation funds available to communities in North Carolina. There is a great deal of support throughout North Carolina for removing this prohibition from the STI Law.

Bicycle & Pedestrian Facilities with Roadway Projects – NCDOT's Complete Streets Policy calls for the design and construction of roadways that complement the context and character of the communities they serve.

For many roadway improvement projects in urban, suburban and small towns bicycle and pedestrian accommodation is appropriate. There is discretion within NCDOT for how these elements of a roadway improvement projects are funded and maintained. Communities should work with their MPO/RPOs, local transportation planning officials, NCDOT Division and Central staffs to identify priority projects and negotiate details associated with the type, location, funding and maintenance of biking and walking infrastructure associated with upcoming projects.

State Parks Funding - There are dollars available through the Parks and Recreation Trust Fund (PARTF), which provides dollar-for-dollar matching grants to local governments for parks and recreational projects to serve the public. PARTF is the primary source of funding to build and renovate facilities in the state parks as well as to buy land for new and existing parks.[2]

1 https://files.nc.gov/dncr-trails/documents/files/rtp-general-information.pdf

2 https://www.ncparks.gov/more-about-us/parks-recreation-trust-fund/parks-and-recreation-trust-fund

LOCAL FUNDING

Concord's **Pedestrian Improvement Program (PIP)** currently allocates approximately $150K per year for pedestrian improvement projects. The $150,000 allocation typically cannot adequately fund a single sidewalk project, so this annual allocation is commonly combined over several years to complete a more substantial project. However, in order to make desired improvements to the pedestrian and bicycle transportation network, this fund should be increased substantially and include funds for more than just sidewalks.

Bonds – Wake County, the City of Raleigh, and the City of Wilmington have all passed bonds to protect open space corridors and build greenway networks. These bonds generally pass with high community support and often lead to future bond initiatives to keep building the network. Other communities that have used bonding for greenways include, the Town of Chapel Hill, Town of Cornelius and the City of Greenville. Often multi-use paths and greenways are included in municipal transportation bond packages.

Successful bond campaigns require a well-defined plan with specific projects supported by the community. Bond campaigns should be well organized with a community's public affairs department and thoroughly coordinated across all internal departments. Public outreach during the campaign is essential to educate residents about the benefits of infrastructure investment and to understand which projects garner the highest community support. Communication should continue after a successful bond to inform voters how bond dollars are being spent and to highlight when projects are completed. This is an essential step that will make future bond campaigns more successful. Example campaign brochures from Raleigh and Wilmington are provided in Appendix K and L, respectively. Wake County's sample Ballot is also provided as Appendix M. All three include ballot language as it appeared on each community's ballot.

PUBLIC PRIVATE PARTNERSHIPS

The City of Greensboro is leading North Carolina in leveraging public-private partnerships to complete their Downtown Greenway Loop. Through the Action Greensboro Foundation, the project has raised over $10M in private funds by working with foundations and private givers. This money leverages over $21 M in local and federal funds.

Developer Dedicated Land - The Town of Cary built its first greenway 40 years ago and now has more than 80 miles of greenway trails. A big part of their network development has been the result of developer-built trails. The Town of Cary works with developers to set aside important open space that provides trail connectivity, wildlife habitat corridors, and water quality protection. Per the Cary Land Use Ordinance developers must dedicate land or make payment in lieu for public park and or greenway development to serve the recreational needs of the residents. Land dedications for greenways are required for both residential and commercial development for those locations in the Town's latest greenway master plan. Easement dedication for greenway purposes is a separate requirement from parkland dedication. Though the land dedicated for greenway purposes may be counted towards parkland dedication requirements with the exception of easements for street-side trails. If the Town of Cary's Parks, Recreation and Cultural Resources Facilities Master Plan indicates a future greenway through a proposed development, whether residential or non-residential, a strip of greenway land through this area shall be dedicated to the Town, at a minimum of thirty (30) feet, but not to exceed fifty (50) feet in width; widths of easements may be reduced to twenty (20) feet in those cases where the developer is constructing the greenway trail. Widths of greenway easements for street-side trails [see Section 7.10.4 (C)] shall be determined by the Parks, Recreation and Cultural Resources Director.

CHARITABLE DONATIONS / FOUNDATIONS

The Carolina Thread Trail is a comprehensive effort aimed at preserving and enhancing our region's natural resources for the enjoyment of future generations. It is about collaboration, connectivity, and leverage: collaborating to promote and protect the region's quality of life; connecting communities and people and leveraging catalytic private capital with public capital to protect and create local and regional assets. It seeks to accomplish its objectives by inviting and encouraging communities to participate in a regional effort through their local actions. All communities within the 15-county region described below are eligible to participate, regardless of their current level of trail development. Counties include Anson, Cabarrus, Catawba, Cleveland, Gaston, Iredell, Lincoln, Mecklenburg, Rowan, Stanly and Union.

Cabarrus County received Carolina Thread Trail Grants for their County Wide Greenway Master Plan and the Rocky River Greenway and Blueway Plan. Thread Trail funding is available for additional planning at the corridor and feasibility levels. Grants as also available towards matching federal programs funding for design and construction projects.

Greenway Foundations focus on developing and maintaining trails and green corridors on a County-wide basis. The City could seek land leases along their trails as a funding source, in addition to selling miles of trails to community corporations and nonprofits in the City. The development rights along the trails can also be sold to local utilities for water, sewer, fiber optic, and cable lines on a per mile basis to support development and management of these corridors. Some greenway foundations have created its own specific Greenway Trail license plate to help support the development, maintenance, and expansion of trails in their city. The cities get $45 dollars from each greenway tag sold. This could really be expanded if promoted on trails, in publications and on the city's website.

Greenways Conservation Groups adopt green corridors to support the operations and capital costs for specific greenway corridors. These groups raise needed money for designated greenways for capital and operations costs. Another strategy used by several communities is the creation of a greenway trust fund for land acquisition and facility development that is administered by a private greenway advocacy group, or by a local greenway commission. A trust fund can aid in the acquisition of large parcels of high priority properties that may be lost if not acquired by private sector initiative. Money may be contributed to the trust fund from a variety of sources, including municipal and county general funds, private grants, and gifts.

PROGRAMMING CONSIDERATIONS

As outlined in the City of Concord 2030 Land Use Plan, "Specific, objective, and quantifiable performance measures must be established so that the City and others can determine if Concord is making progress toward achievement…" Analyzing performance measure results help guide and inform decisions as development of the network progresses. In conjunction with the Land Use Plan, the following performance measures regarding a multi-model, connected transportation system should be considered.

- Miles of sidewalk installed
- Miles of new dedicated bicycle facilities
- Miles of new multi-use trail
- Miles of new greenway
- Miles of Complete Streets
- Number of bicyclists
- Number of pedestrian utilizing greenway and/or multi-use paths
- Number of new transit riders
- Increase in transit service area
- Number of new transit stops (or at least new transit stops near parks and schools)
- Improvement in mobility index

Establishing a long-term monitoring program allows a City to be more effective when planning and designing trails. Quantifiable user data really tells the story of the return on investment for bicycle and pedestrian projects. Along with the performance measures previously described, additional data to gather should include results of economic surveys as well as a historic look at property value trends along greenway and multi-use corridors.

But the City doesn't have to gather this data alone. Partnering with regional universities, NCDOT, the Cabarrus-Rowan MPO, and area visitors' bureaus can provide an invaluable resource to help Concord realize the impact the connected, multi-modal network is having on the City. As data is gathered, Concord should not be hesitant to share the data. Seeing what other municipalities are doing and the positive impacts facilities like greenways and multi-use paths are having on the community is often a catalyst for change in neighboring jurisdictions. This is also a great way to improve community awareness of the trail network.

Other ways to bolster community awareness and bring more attention to the bicycle/pedestrian facilities that Concord offers include:

- Regularly updating the Parks and Recreation Department's greenways webpage with new maps and information on additions to the system.
- Incorporating wayfinding signage throughout the system that provides time and distance information to popular destinations, including greenway trailheads and connections.
- Continue to offer and expand parks and recreation programming that exposes children and adults to the greenway network. This not only provides recreational value but can also be a means of education with opportunities to learn about water quality, sensitive ecosystems, and native landscapes.
- Pursue marketing campaigns promoting greenways and multi-use paths as an alternative means of transportation.
- Integrate transit connections into potential trail users' awareness. Knowledge of transit connections in conjunction with trail access exposes a segment of the population that may not have otherwise been aware of the connection and therefore had not previously engaged in activities within the trail network.
- Develop a program on bike safety to educate the public on the benefits and importance of bike helmet use, bicycle etiquette, safe passing, etc. while exposing participants to network facilities.

MAINTENANCE GUIDANCE

Operations and maintenance refer to specific tasks performed to make sure facilities and resources are kept in a stable, usable condition. Good maintenance begins with sound planning and design with a primary focus to protect life, property, and the environment. A well-managed bicycle/pedestrian networks typically includes stewardship, resource oversight, and operations and maintenance consisting of both routine and remedial activities.

- Routine operations refer to the daily activities required to run a system network.
- Remedial operations refer to activities required to sustain the network's quality and extend its life.
- Routine maintenance refers to the day-to-day tasks like litter pick-up, trash and debris removal, weed control, tree and shrub trimming, etc. and minor replacements and repairs.
- Remedial maintenance refers to attending to significant defects in the network, as well as repairing, replacing or restoring destroyed, damaged, or significantly deteriorated major components of the network. Some remedial maintenance activities like repainting may be set on regular, long term schedule and should be part of a long-term capital improvement plan.

An operations and maintenance plan should be reviewed and updated annually, responding to lessons learned and changes in tasks, operational policies, standards, and routine and remedial maintenance goals.

The City of Greensboro, North Carolina put together an excellent operations and maintenance manual as part of their Bicycle, Pedestrian, and Greenway Plan. It is included in this report for reference as Appendix N. Another excellent resource known as "Best Practices in Trail Maintenance – A Manual by the Ohio River Greenway" has also been provided (Appendix O) as prepared by Indiana Local Technical Assistance Program (LTAP) Center.

Within these two documents, information on trends and standards, recommended tasks, recommended frequency of maintenance tasks, agency responsibilities, and estimated costs for routine and remedial tasks can be found. Funding sources, conflict reduction, contractor selection considerations and maintenance priorities are also discussed.

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9 appendix





APPENDIX CONTENTS

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CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	I-85	Mecklenburg Co - Bruton Smith Blvd (SR 2894)	Concord	0.5	48	4D	340	65	114700	105000	186700	152000	143000	8-D	8-D	300	300	F	Sta	
	I-85	Bruton Smith Blvd (SR 2894) - Poplar Tent Rd (SR 1394)	Concord	2.9	48	4D	340	65	114700	88000	167200	127700	143000	8-D	8-D	300	300	F	Sta	
	I-85	Poplar Tent Rd (SR 1394) - George Liles Pkwy (SR 2894)	Concord	1.9	48	4D	340	65	114700	84000	155500	122900	143000	8-D	8-D	300	300	F	Sta	
	I-85	George Liles Pkwy (SR 2894) - NC 73	Concord	1.5	48	4D	290	65	114700	79000	159700	123200	143000	8-D	8-D	300	300	F	Sta	
I-3802 A	I-85	NC 73 - US 29	Concord	2.9	48	4D	290	65	56300	79000	151000	128000	143000	8-D	8-D	300	300	F	Sta	
I-3802 A	I-85	US 29 - Centergrove Rd (SR 2114)	Concord	2.7	48	4D	310	65	56300	71000	115000	126700	143000	8-D	8-D	300	300	F	Sta	
I-3802 A	I-85	Centergrove Rd (SR 2114) - Lane St (SR 2180)	Kannapolis	1.4	48	4D	290	65	56300	75000	106400	128200	143000	8-A	8-D	300		F	Sta	
I-3802B	I-85	Lane St (SR 2180) - Rowan County	Cabarrus County	0.4	48	4D	290	65	56300	69000	92800	122800	114700	8-A	8-D	300		F	Sta	
I-3802B	I-85	Cabarrus County - Old Beatty Ford Rd (SR 1221)	Rowan County	1.7	48	4D	290	65	56300	69000	89200	122800	114700	8-A	8-D	300		F	Sta	
I-3802B	I-85	Old Beatty Ford Rd (SR 1221) - NC 152	Rowan County	3.4	48	4D	290	65	56300	69000	89200	115300	114700	8-A	8-D	300		F	Sta	
I-3802B	I-85	NC 152 - US 29	China Grove	0.6	96	6D	290	65	114700	68000	89800	116400	114700	8-A	8-D	300		F	Sta	
	I-85	US 29 - NC 152 Bypass	Rowan County	1.0	96	8D	290	65	114700	73000	94000	110400	114700	8-A	8-D	290	300	F	Sta	
	I-85	NC 152 Bypass - Airport Pkwy	Rowan County	2.6	96	8D	350	65	114700	75000	94800	111100	114700	8-A	8-D	350	300	F	Sta	
	I-85	Airport Pkwy - US 70 (Jake Alexander Blvd)	Rowan County	1.5	96	8D	350	65	114700	75000	98700	106500	114700	8-A	8-D	350	300	F	Sta	
	I-85	US 70 (Jake Alexander Blvd) - US 52 (Innes St)	Salisbury	1.7	96	8D	330	65	114700	69000	101100	100900	114700	8-A	8-D	330	300	F	Sta	
	I-85	US 52 (Innes St) - Bringle Ferry Rd (SR 1002)	Salisbury	0.8	96	8D	390	65	114700	67000	99900	95100	114700	8-A	8-D	390	300	F	Sta	
	I-85	Bringle Ferry Rd (SR 1002) - US 52 Bypass	Rowan County	1.5	96	8D	460	65	114700	65000	89300	92200	114700	8-A	8-D	460	300	F	Sta	
	I-85	US 52 Bypass - Long Ferry Rd (SR 2120)	Rowan County	1.5	96	8D	360	65	114700	63000	88800	94500	114700	8-A	8-D	360	300	F	Sta	
	I-85	Long Ferry Rd (SR 2120) - Davidson Co	Rowan County	1.8	48	4D	260	65	56300	63000	89700	95600	114700	8-A	8-D	300		F	Sta	
CR-000X-H	US 29 (Concord Pkwy)	Mecklenburg Co - Caldwell Road Ext (SR 1302)	Harrisburg	0.5	90	6D	120	50	59900	22000	38000	29500	59900	6-B		150		B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Caldwell Road Ext (SR 1302)- Morehead Road (SR 1300)	Harrisburg	0.3	90	6D	160	50	59900	22000	38000	31900	59900	6-B		150		B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Morehead Rd (SR 1300)- Bruton Smith Blvd (SR 2894)	Concord	0.3	90	6D	160	50	59900	25000	37200	37800	59900	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Bruton Smith Blvd (SR 2894) - Rocky River	Concord	0.9	72	6D	160	50	59900	28000	40300	41800	59900	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Rocky River - Pitts School Rd (SR 1305)	Concord	0.7	60	4D	120	55	40000	27000	33900	40300	59900	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Pitts School Rd (SR 1305)- George Liles Pkwy (SR 1310)	Concord	1.3	60	4D	140	55	40000	25000	25700	36200	59900	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	George Liles Pkwy (SR 1310)- Rock Hill Church Rd (SR 1414)	Concord	2.0	60	4D	140	55	40000	30000	37200	39500	59900	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Rock Hill Church Rd (SR 1414)- Cabarrus Ave (SR 1002)	Concord	0.3	60	4D	120	45	35100	38000	50100	38000	59900	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Cabarrus Ave (SR 1002)- US 601	Concord	0.3	60	4D	120	45	35100	20000	44200	36900	59900	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	US 601 - Weddington Rd Ext (SR 1431)	Concord	0.2	60	4D	120	45	35100	33000	37100	45200	66000	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Weddington Rd Ext (SR 1431) - Poplar Tent Rd (SR 1394)	Concord	0.8	60	4D	120	45	35100	34000	36100	51000	66000	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Poplar Tent Rd (SR 1394)- Central Dr	Concord	0.9	60	4D	120	45	35100	35000	37100	49500	66000	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Central Dr - NC 73 (Davidson Hwy)	Concord	0.4	72	4D	120	45	35100	23000	28400	32500	66000	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	NC 73 (Davidson Hwy) - NC 73 (Davidson Dr)	Concord	0.3	72	4D	120	45	35100	35000	37500	59100	66000	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	NC 73 (Davidson Dr) - Church St (SR 2287)	Concord	0.2	72	4D	120	45	35100	26000	30700	44000	66000	6-F	6-F	130	130	B	Reg	

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	US 29 (Concord Pkwy)	Church St (SR 2287) - Main St (SR 1008)	Concord	0.5	65	4D	120	45	35100	37000	49000	47700	66000	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Concord Pkwy)	Main St (SR 1008) - I-85 S	Concord	0.5	60	4D	120	35	28100	36000	32900	43800	66000	6-F	6-F	130	130	B	Reg	
CR-000X-H	US 29 (Cannon Blvd)	I-85 - Dakota St	Kannapolis	1.5	70	4D	100	45	35100	24000	21900	26700	35100	4-D		110		B	Reg	
CR-000X-H	US 29 (Cannon Blvd)	Dakota St - NC 3 (Dale Earnhardt Blvd)	Kannapolis	0.6	70	4D	100	45	35100	22000	31100	23600	35100	4-D		110		B	Reg	
CR-000X-H	US 29 (Cannon Blvd)	NC 3 (Dale Earnhardt Blvd) - Lane St (SR 2000)	Kannapolis	1.9	60	4D	100	45	35100	20000	23600	21800	35100	4-D		110		B	Reg	
CR-000X-H	US 29 (Cannon Blvd)	Lane St (SR 2000)- Rowan Co	Kannapolis	0.2	60	4D	100	45	35100	17000	21200	20000	35100	4-D		110		B	Reg	
CR-000X-H	US 29 (Cannon Blvd)	Cabarrus Co- 22nd St (SR 1254)	Kannapolis	1.4	60	4D	100	45	35100	16000	19600	16900	35100	4-D		110		B	Reg	
CR-000X-H	US 29 (Cannon Blvd)	22nd St (SR 1254)- Chapel St (SR 1464)	Kannapolis	0.4	60	4D	100	45	35100	15000	22100	13700	35100	4-D		110		B	Reg	
CR-000X-H	US 29 (Cannon Blvd)	Chapel St (SR 1464)- Ryder Ave (SR 1210)	Kannapolis	0.7	60	4D	100	45	35100	11000	15300	10000	35100	4-C	4-D	120	110	B	Reg	
CR-000X-H	US 29 (Cannon Blvd)	Ryder Ave (SR 1210) - Bostian Rd (SR 1221)	Landis	0.6	60	4D	100	55	40000	11000	14300	10000	40000	4-E		135		B	Reg	
CR-000X-H	S. US 29	Bostian Rd (SR 1221) - NC 152 W	China Grove	1.7	60	4D	100	55	40000	14000	16700	12800	40000	4-B		100		B	Reg	
CR-000X-H	S. US 29	NC 152 W - NC 152 E	China Grove	0.6	60	4D	100	55	40000	16000	12700	14500	40000	4-B		100		B	Reg	
	US 29 (Main St)	NC 152 E- NC 152 Bypass (SR 1505)	Rowan County	1.5	60	4D	100	55	40000	10000	11800	10300	40000	5-A		100		Maj	Reg	
	US 29 (Main St)	NC 152 Bypass (SR 1505) - Webb Rd (SR 1500)	Rowan County	0.9	60	5	100	55	40000	10000	9600	14200	40000	5-A		100		Maj	Reg	
	US 29 (Main St)	Webb Rd (SR 1500) - Cedar Springs Rd Ext (SR 1560)	Rowan County	1.6	60	5	100	55	40000	12000	12900	15200	40000	5-A		100		Maj	Reg	
	US 29 (Main St)	Cedar Springs Rd Ext (SR 1560) - US 70 (Jake Alexander Blvd)	Salisbury	2.4	60	5	100	35	28100	14000	16600	12600	28100	5-A		100		Maj	Reg	
	US 29 (Main St)	US 70 (Jake Alexander Blvd) - NC 150 (Mooresville Hwy)	Salisbury	0.5	44	4	100	35	28100	8400	9800	8900	28100	(1)		100		Maj	Reg	
	US 29 (Main St)	NC 150 (Mooresville Hwy) - Crawford St	Salisbury	0.7	36	2	50	35	28100	7900	8900	7800	28100	2-E		50		Maj	Reg	
	US 29 (Main St)	Crawford St - Fisher St	Salisbury	0.6	50	4	80-90	35	28100	7500	12100	7500	28100	(1)		80-90		Maj	Reg	
	US 29 (Main St)	Fisher St - W Innes St (SR 2200)	Salisbury	0.1	66	4	100	20	25400	6900	9700	6900	25400	(1)		100		Maj	Reg	
	US 29 (Main St)	W Innes St (SR 2200) - 17th St	Salisbury	1.6	50	4	100	35	28100	6500	11100	6300	28100	(1)		100		Maj	Reg	
	US 29 (Salisbury Ave)	17th St - 8th St	Spencer	0.7	50	4	60	35	28100	6800	9300	5200	28100	(1)		60		Maj	Reg	
	US 29 (Salisbury Ave)	8th St. - 3rd St.	Spencer	0.4	50	4	60	35	28100	6800	18600	5300	28100	(1)		60		Maj	Reg	
	US 29 (Salisbury Ave)	3rd St. - Jake Alexander Blvd N	Spencer	1.1	48	4	60	35	28100	6400	9300	5300	28100	3-B		60		Maj	Reg	
	US 29 (Salisbury Ave)	Jake Alexander Blvd N - Davidson Co.	Spencer	2.2	42	4	100	55	40000	6000	4800	7500	40000	3-B		100		Maj	Reg	
	US 52	Stanly Co - Rowan Co	Cabarrus County	1.1	24	2	60	55	15100	6700	10400	5200	15100	2-A	4-D	60	110	Maj	Reg	
CR-000X-H	US 52	Cabarrus Co - Old Beatty Ford Rd (SR 1221)	Rowan County	0.5	28	2	60	55	15100	6700	10400	21500	36600	4-E	4-E	110		B	Sta	
CR-000X-H	US 52	Old Beatty Ford Rd (SR 1221) - Old US 80 (SR 2350)	Rowan County	2.1	28	2	60	55	15100	6900	12000	24100	36600	4-E	4-E	110		B	Sta	
CR-000X-H	US 52	Old US 80 (SR 2350) - Sides Rd (SR 2340)	Rowan County	2.5	28	2	60	45	14600	7900	12500	21500	36600	4-E	4-E	110		B	Sta	
	US 52	Sides Rd (SR 2340) - Emanual Church Rd (SR 2338)	Rockwell	1.2	38	2	60	45	12700	8200	11600	6400	12700	2-B		60		Maj	Reg	
	US 52	Emanual Church Rd (SR 2338) - NC 152 Ext	Rockwell	0.4	38	3	60	45	12700	9500	15700	7500	12700	3-B		60		Maj	Reg	
	US 52	NC 152 Ext - Salisbury St (SR 2344)	Rockwell	0.3	38	3	60	35	12700	11000	14000	7100	11100	2-C		60		Maj	Reg	
	US 52	Salisbury St (SR 2344) - Wilcoy Rd (SR 2325)	Rockwell	0.6	28	3	60	35	11600	12000	15300	7700	11600	3-B		60		Maj	Reg	
	US 52	Wilcoy Rd (SR 2325) - Stone Rd (SR 2315)	Rockwell	1.2	28	2	60	45	12700	12000	14500	11200	12700	2-B		60		Maj	Reg	
	US 52	Stone Rd (SR 2315) - Granite Quarry City Limits	Rowan County	1.0	28	2	60	45	12700	13000	15900	12700	12700	2-B		60		Maj	Reg	
	US 52 (Salisbury Ave)	Granite Quarry City Limits - Brown Acres Rd (SR 2381)	Granite Quarry	0.4	28	2	60	45	12200	12000	15600	12300	12200	2-B		60		Maj	Reg	
	US 52 (Salisbury Ave)	Brown Acres Rd (SR 2381) - Dunns Mountain Rd (SR 2131)	Granite Quarry	1.1	28	2	100	45	12200	13000	15100	11100	12200	2-B		100		Maj	Reg	
	US 52 (Salisbury Ave)	Dunns Mountain Rd (SR 2131) - Dunns Mountain Church Rd (SR 2126)	Granite Quarry	2.9	42	3	100	35	12700	14000	18000	11000	12700	3-B		100		Maj	Reg	
	US 52 (Salisbury Ave)	Dunns Mountain Church Rd (SR 2126) - Salisbury City Limits	Granite Quarry	0.3	52	4D	100	35	22200	15000	17300	22000	22200	(1)	3-B	100		Maj	Reg	
	US 52 (Innes St)	Salisbury City Limits - Jake Alexander Blvd (SR 1007)	Salisbury	0.5	52	4	60	45	24600	15000	17300	22500	24600	(1)		60		Maj	Reg	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	US 52 (Innes St)	Jake Alexander Blvd (SR 1007) - Stokes Ferry Rd (SR 1004)	Salisbury	0.7	52	4	60	45	24600	12000	17000	23100	24600	4-C	ADQ	60		Maj	Reg	
	US 52 (Innes St)	Stokes Ferry Rd (SR 1004) - I-85	Salisbury	0.3	52	5	60	45	24600	25000	22200	24000	24600	4-C	ADQ	60		Maj	Reg	
		Concurrent with I-85																		
CR-000X-H	US 52 Bypass (Misenheimer)	Stanly Co - Rowan Co	Cabarrus County	1.1	-	-	-	-	-	-	-	16000	28100	4-D		110		B	Sta	
CR-000X-H	US 52 Bypass (Rockwell)	US 52 S - Sides Rd (SR 2340)	Rockwell	0.4	20	2	60	55	12000	-	-	17700	45200	4-E		135		B	Sta	
CR-000X-H	US 52 Bypass (Rockwell)	Sides Rd (SR 2340) - Sides Rd (SR 2344)	Rockwell	0.7	-	-	-	-	-	-	-	20100	45200	4-E		135		B	Sta	
CR-000X-H	US 52 Bypass (Rockwell)	Sides Rd (SR 2344) - US 52 S	Rockwell	2.1	20	2	60	45	11900	-	-	23800	45200	4-E		135		B	Sta	
CR-000X-H	US 52 Bypass (Granite Quarry)	US 52 S - Brown Acres Road (SR 2381)	Rowan County	2.0	--	--	--	--	-	-	-	20400	45200	4-E		110		B	Sub	M
CR-000X-H	US 52 Bypass (Granite Quarry)	Brown Acres Road (SR 2381) - Dunns Mountain Rd (SR 2131)	Rowan County	1.3	16	2	60	55	13100	500	-	20600	45200	4-E		110		B	Sub	M
CR-000X-H	US 52 Bypass (Granite Quarry)	Dunns Mountain Rd (SR 2131) - US 52 N	Rowan County	1.3	--	--	--	--	-	-	-	23400	45200	4-E		110		B	Sub	M
	US 70 (Statesville Blvd)	Iredell Co - Amity Hill Rd (SR 1001)	Rowan County	3.2	60	4D	220	55	14600	10000	16600	13700	40500	4-C	4-D	220	110	B	Sta	
	US 70 (Statesville Blvd)	Amity Hill Rd (SR 1001) - Mimosa St	Cleveland	1.0	60	4D	220	35	28100	10000	18500	13100	28100	4-B	4-D	220	110	B	Sta	
	US 70 (Statesville Blvd)	Mimosa St - NC 801	Rowan County	2.2	60	4D	220	55	35100	11000	11700	14100	35100	4-B	4-D	220	110	B	Sta	
	US 70 (Statesville Blvd)	NC 801 - NC 801	Rowan County	1.4	60	4D	220	55	35100	11000	10700	13700	35100	4-B	4-D	220	110	B	Sta	
	US 70 (Statesville Blvd)	NC 801 - Kepley Rd (SR 1953)	Rowan County	2.7	60	4D	200	55	35100	11000	11000	13900	35100	4-B	4-D	200	110	B	Sta	
	US 70 (Statesville Blvd)	Kepley Rd (SR 1953)- Enon Church Rd (SR 1944)	Rowan County	1.8	60	4D	200	45	35100	14000	14900	18300	35100	4-B	4-D	200	110	B	Sta	
	US 70 (Statesville Blvd)	Enon Church Rd (SR 1944) - US 601 (Jake Alexander Blvd)	Salisbury	1.7	60	4D	200	45	35100	19000	20900	24900	35100	4-D	4-D	200	110	B	Sta	
	US 70 (Jake Alexander Blvd)	US 601 (Jake Alexander Blvd) - NC 150 (Mooresville Rd)	Salisbury	2.6	60	5	190	45	26800	29000	24600	28500	43900	4-D	4-D	190	110	B	Sta	
	US 70 (Jake Alexander Blvd)	NC 150 (Mooresville Rd) - US 29 (Main St)	Salisbury	0.7	60	4D	190	45	35100	37000	40100	40700	43900	4-D	4-D	190	110	B	Sta	
		Concurrent with US 29																		
CR-000X-H	US 601 (Concord Hwy)	Union County - S Midland Town Limits	Cabarrus County	1.9	32	2	100	55	15100	5700	8900	12100	42500	4-C		110		B	Reg	
CR-000X-H	US 601 (Concord Hwy)	S Midland Town Limits - Railroad Crossing	Midland	0.5	32	2	100	35	11100	7300	12000	15900	28100	4-C		110		B	Reg	
CR-000X-H	US 601 (Concord Hwy)	Railroad Crossing - NC 24/27	Midland	1.7	32	2	100	35	11100	8600	15200	20800	28100	4-C		110		B	Reg	
CR-000X-H	US 601 (Concord Hwy)	NC 24/27 - Anderson Creek	Midland	1.2	32	2	100	45	12200	7500	12400	17700	36600	4-C		110		B	Reg	
CR-000X-H	US 601 (Concord Hwy)	Anderson Creek - N Midland Town Limits	Midland	1.1	32	2	100	45	12200	6200	10700	14200	43600	4-C		110		B	Reg	
CR-000X-H	US 601 (Concord Hwy)	N Midland Town Limits - NC 200	Cabarrus County	3.4	40	2	100	55	15100	6000	8100	13000	43600	4-C		110		B	Reg	
CR-000X-H	US 601 (Concord Hwy)	NC 200 - Flowes Store Rd (SR 1132)	Cabarrus County	2.8	40	2	100	55	15100	11000	18300	22600	45000	4-C		110		B	Reg	
CR-000X-H	US 601 (Concord Hwy)	Flowes Store Rd (SR 1132)- NC 49	Concord	0.9	24	2	100	55	14600	18000	30600	37500	50000	4-C		110		B	Reg	
CR-000X-H	US 601 (Warren Coleman Blvd)	NC 49 - NC 3 (Union St S)	Concord	0.1	42	4D	180	35	22300	25000	39100	52000	45800	4-C		110		B	Reg	
CR-000X-H	US 601 (Warren Coleman Blvd)	NC 3 (Union St S) - Zion Church Rd (SR 1155)	Concord	1.9	32	2	180	45	12200	14000	17600	31400	4580	4-C		110		B	Reg	
CR-000X-H	US 601 (Warren Coleman Blvd)	Zion church Rd (SR 1155) - Wilshire Ave (SR 1157)	Concord	0.1	32	2	180	45	12200	16000	23200	33700	45800	4-C		110		B	Reg	
CR-000X-H	US 601 (Warren Coleman Blvd)	Wilshire Ave (SR 1157) - Cabarrus Ave (SR 10020	Concord	1.7	32	2	180	45	12200	22000	32600	46100	45800	4-C		110		B	Reg	
CR-000X-H	US 601 (Warren Coleman Blvd)	Cabarrus Ave (SR 1002) - US 29	Concord	0.3	63	4D	180	45	24600	23000	22600	36300	45800	4-C		110		B	Reg	
		Concurrent with US 29																		
		Concurrent with I-85																		
	US 601 (Jake Alexander Blvd. S)	I-85 - US 29/70 (S. Main St)	Salisbury	1.2	68	5	150	45	26800	30000	25500	34100	33500	5-A		150	100	B	Sta	
		Concurrent with US 70																		
CR-000X-H	US 601 (Jake Alexander Blvd. N)	US 70 (Statesville Blvd) - W. Innes St (SR 2200)	Salisbury	1.8	24	2	60	55	14600	6900	7800	19400	40500	4-D		110		B	Reg	
	US 601 (Mocksville Road)	W. Innes St (SR 2200) - W Ridge Rd (SR 1915)	Rowan County	0.9	28	2	60	55	14600	8900	12000	10500	14600	2-A		60		Maj	Reg	
	US 601 (Mocksville Road)	W Ridge Rd (SR 1915) - Young Rd (SR 1928)	Rowan County	2.2	28	2	60	55	15100	7200	10000	9800	15100	2-A		60		Maj	Reg	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	US 601 (Mocksville Road)	Young Rd (SR 1928) - Davie Co	Rowan County	2.0	28	2	150	55	15100	4700	7300	6500	15100	2-A		150	60	Maj	Reg	
CR-000X-H	NC 3 (S Union St)	US 601 (Warren C. Coleman Blvd) - Old Airport Rd (SR 2635)	Concord	0.5	24	2	60	35	11100	12000	16900	27200	33500	5-A		100		B	Reg	
CR-000X-H	NC 3 (Branchview Dr)	Old Airport Rd (SR 2635) - NC 73	Concord	2.4	36	2	200	35	11100	11000	16200	26300	43900	4-A	4-A	180	200	B	Reg	
CR-000X-H	NC 3 (Branchview Dr)	NC 73 - Cabarrus Ave (SR 1002)	Concord	0.6	36	2	100	45	12200	19000	19100	50100	43900	4-C		110		B	Reg	
CR-000X-H	NC 3 (Branchview Dr)	Cabarrus Ave (SR 1002) - Copperfield Blvd	Concord	2.7	32	2	100	45	12200	20000	24900	43600	43900	4-C		110		B	Reg	
CR-000X-H	NC 3 (Branchview Dr)	Copperfield Blvd - Kannapolis City Limits	Concord	0.6	32	2	100	45	12200	15000	17600	24300	35100	4-C		110		B	Reg	
CR-000X-H	NC 3 (Concord Lake Rd)	Concord City Limits - Centergrove Rd (SR 2114)	Kannapolis	1.7	33	2	70	45	12200	13000	14600	25800	35100	4-D		110		B	Reg	
CR-000X-H	NC 3 (Dale Earnhardt Blvd)	CentergroveRd (SR 2114) - US 29 (Cannon Blvd)	Kannapolis	0.9	48	4	60	45	24600	20000	27800	30000	35100	4-D		110		B	Reg	
CR-000X-H	NC 3 (Dale Earnhardt Blvd)	US 29 (Cannon Blvd) - Rogers Lake Road (SR 1766)	Kannapolis	0.9	64	4	80	45	24600	15000	23600	21300	35100	4-D		110		B	Reg	
CR-000X-H	NC 3 (Dale Earnhardt Blvd)	Rogers Lake Road (SR 1766) - Main St (SR 1008)	Kannapolis	1.2	64	4	80	45	24600	16000	24100	21700	35100	4-D		110		B	Reg	
CR-000X-H	NC 3 (Dale Earnhardt Blvd)	Main St (SR 1008) - Pine St (SR 1609)	Kannapolis	0.9	59	5	80	35	24300	12000	19400	15800	35100	4-D		110		B	Reg	
U-3440	NC 3 (Mooresville Hwy)	Pine St (SR 1609) - Kannapolis Pkwy (SR 1624)	Kannapolis	2.6	20	2	60	55	12000	10000	20200	15400	35100	4-D		110		B	Reg	
CR-000X-H	NC 3 (Mooresville Hwy)	Kannapolis Pkwy (SR 1624) - Iredell Co	Cabarrus County	6.7	20	2	100	55	14100	9000	15800	13900	40500	4-D		110		B	Reg	
	NC 8	Stanly Co - Davidson Co	Rowan County	0.3	48	4D	150	55	40000	6900	7000	9900	40000	4-A		150	180	B	Sta	
	NC 24	Meck County - Sam Black Rd (SR 1127)	Cabarrus County	3.1	48	4D	200	55	45300	18000	29900	27200	45300	4-A		200		E	Sta	
CR-000X-H	NC 24	Sam Black Rd (SR 1127) - McManus Rd (SR 1107)	Midland	3.7	64	5	100	45	26800	17000	24900	24700	45300	4-E		120		E	Sta	
	NC 24	McManus Rd (SR 1107) - Stanly Co	Cabarrus County	1.3	48	4D	200	55	45300	16000	23400	23200	45300	4-A		200		E	Sta	
	NC 27	Concurrent with NC 24	Midland	8.4																
	NC 49	Mecklenburg County - Caldwell Rd (SR 1173)	Harrisburg	0.5	48	4D	100	45	35100	27000	45300	42700	43900	4-C		100		B	Sta	
	NC 49	Caldwell Rd (SR 1173) - Morehead Rd (SR 1300)	Harrisburg	0.9	65	5	100	35	24300	29000	43100	30800	40000	4-D		110		B	Sta	
	NC 49	Morehead Rd (SR 1300) - Robinson Church Rd (SR 1166)	Harrisburg	0.3	65	5	80	35	24300	32000	47300	35500	40000	4-D		110		B	Sta	
	NC 49	Robinson Church Rd (SR 1166) - Roberta Rd (SR 1304)	Harrisburg	0.4	65	5	80	35	24300	30000	43100	36800	40000	4-B		110		B	Sta	
	NC 49	Roberta Rd (SR 1304) - Coddle Creek	Harrisburg	0.4	48	4D	220	45	35100	23000	37000	21600	35400	4-B		220		B	Sta	
	NC 49	Coddle Creek - Blackwelder Rd (SR 1307)	Concord	0.4	48	4D	220	45	35100	23000	31400	24600	35400	4-B		220		B	Sta	
	NC 49	Blackwelder Rd (SR 1307) - George Liles Blvd (1309)	Concord	0.9	48	4D	220	45	35100	23000	36000	28900	30800	4-B		220		B	Sta	
	NC 49	George Liles Blvd (SR 1309) - Old Charlotte Rd (SR 1157)	Concord	1.1	48	4D	150	45	35100	20000	36900	27200	30800	4-B	4-B	220	220	B	Sta	
	NC 49	Old Charlotte Rd (SR 1157) - Zion Church Rd (SR 1155)	Concord	1.2	48	4D	200	45	35100	19000	27500	25500	30800	4-B	4-B	220	220	B	Sta	
	NC 49	Zion Church Rd (SR 1155) - US 601 (Warren Coleman Blvd)	Concord	1.6	48	4D	220	45	35100	15000	26100	22100	30800	4-B		220		B	Sta	
	NC 49	US 601 (Warren Coleman Blvd) - Cold Springs Rd (SR 2411)	Concord	3.6	48	4D	220	45	35100	13000	23300	18600	30800	4-B		220		B	Sta	
	NC 49	Cold Springs Rd (SR 2411) - Walker Rd (SR 2710)	Mt Pleasant	0.8	48	4D	220	45	35100	9700	20400	12200	30800	4-B		220		B	Sta	
	NC 49	Walker Rd (SR 2710) - NC 73	Mt Pleasant	1.8	25	2	60	55	14600	9500	17200	11700	45300	4-E		135		B	Sta	
	NC 49	NC 73 - Mt Pleasant Rd (SR 1006)	Mt Pleasant	0.9	24	2	60	45	12700	8200	11300	12600	45300	4-E		135		B	Sta	
	NC 49	Mt Pleasant Rd (SR 1006) - Stanly County	Mt Pleasant	7.4	22	2	60	55	14600	6100	7000	8400	45300	4-E		135		B	Sta	
	NC 49	Concurrent with NC 8	Rowan County	0.3																

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	NC 73 (Davidson Hwy)	Meck Co – Cabarrus Crossing (SR 2949)	Cabarrus County	0.5	36	3	80	55	15900	14000	19600	35300	45200	4-C		110		B	Sta	
CR-000X-H	NC 73 (Davidson Hwy)	Cabarrus Crossing (SR 2949)- Jim Johnson Rd (SR 1602)	Cabarrus County	2.2	24	2	60	55	14600	14000	19300	35900	45200	4-C		110		B	Sta	
CR-000X-H	NC 73 (Davidson Hwy)	Jim Johnson Rd (SR 1602) - Coddle Creek	Cabarrus County	3.0	24	2	60	55	14600	17000	20500	45700	54500	4-C		110		B	Sta	
CR-000X-H	NC 73 (Davidson Hwy)	Coddle Creek – I-85	Kannapolis	2.1	24	2	60	45	12700	16000	24300	40500	54500	4-C	4-F	110		B	Sta	
CR-000X-H	NC 73 (Davidson Hwy)	I -85 - International Blvd (SR 1429)	Concord	0.2	24	2	60	35	11100	22000	41400	46600	54500	4-F	4-F	100	100	B	Reg	
CR-000X-H	NC 73 (Davidson Hwy)	International Blvd (SR 1429) - Central Dr	Concord	2.2	24	2	60	35	11100	17000	22100	40700	43600	4-F	4-F	100	100	B	Reg	
CR-000X-H	NC 73 (Davidson Hwy)	Central Dr - US 29 (Concord Pkwy)	Concord	0.4	20	2	60	35	10400	10000	13400	33800	43600	4-F	4-F	100	100	B	Reg	
CR-000X-H		Concurrent with US 29 (Concord Pkwy)	Concord																	
CR-000X-H	NC 73 (Davidson Dr)	US 29 (Concord Pkwy) - Church St (SR 2287)	Concord	0.3	44	2	60	35	11100	9200	20000	11300	28100	4-C		110		B	Reg	
CR-000X-H	NC 73 (Church St)	Church St (SR 2287) - Winecoff Ave	Concord	0.4	58	4D	60	35	22200	19000	33100	32500	28100	4-C	4-D	110	110	B	Reg	
CR-000X-H	NC 73 (Church St)	Winecoff Ave - Todd Dr	Concord	0.5	58	3C	60	35	22200	19000	23200	28200	28100	4-C	3-C	110	80	B	Reg	
CR-000X-H	NC 73 (Church St)	Todd Dr - Douglas Av	Concord	0.3	46	3	60	35	12700	19000	19600	28200	28100	4-C	3-C	80	80	B	Reg	
CR-000X-H	NC 73 (Church St)	Douglas Av - Buffaloe Ave	Concord	0.3	40	3	60	35	12700	16000	22400	24900	28100	4-C	3-C	80	80	B	Reg	
CR-000X-H	NC 73 (Church St)	Buffaloe Ave - Killarney Ave	Concord	0.6	36	2	60	35	11100	10000	8600	19400	28100	4-C	3-C	80	80	B	Reg	
CR-000X-H	NC 73 (Church St)	Killarney Ave - Cabarrus Ave (SR 1002)	Concord	0.1	44	2	60	20	11000	10000	17400	21100	25400	4-C	3-C	80	80	B	Reg	
CR-000X-H	NC 73 (Church St)	Cabarrus Ave (SR 1002) - Corban Av	Concord	0.2	44	2	60	20	11000	8900	11000	9900	25400	4-C	3-C	80	80	B	Reg	
CR-000X-H	NC 73 (Corban Ave)	Corban Ave - Mccachern Ave	Concord	0.1	44	2	60	20	11000	7700	10200	10300	13800	3-C	3-C	80	80	Maj	Reg	
CR-000X-H	NC 73 (Corban Ave)	Mccachern Ave - NC 3 (Branchview Dr)	Concord	0.5	32	2	60	35	11100	8500	12700	11700	13800	3-C	3-C	80	80	Maj	Reg	
CR-000X-H	NC 73 (Mt. Pleasant Hwy)	NC 3 (Branchview Dr) - Crestmont Dr (SR 2643)	Concord	1.5	24	2	60	35	11100	12000	18400	25400	28100	4-F	4-F	100	100	B	Reg	
CR-000X-H	NC 73 (Mt. Pleasant Hwy)	Crestmont Dr (SR 2643) - NC 49	Cabarrus County	5.7	24	2	100	55	14600	8100	10800	13600	28100	4-C		110		B	Reg	
CR-000X-H	NC 73 (Franklin St)	NC 49 - Mount Pleasant Limits	Mt Pleasant	0.4	24	2	60	45	12200	9300	17900	9100	13800	3-B	4-C	80	110	Maj	Reg	
CR-000X-H	NC 73 (Franklin St)	Mount Pleasant Limits - Mount Pleasant Limits	Mt Pleasant	1.4	24	2	60	35	11100	9500	12300	8000	12700	3-B		80		Maj	Reg	
CR-000X-H	NC 73 (Franklin St)	Mount Pleasant Limits - Mount Pleasant Bypass	Mt Pleasant	0.4	24	2	60	55	12900	7100	10900	6000	15900	3-B		80		Maj	Reg	
CR-000X-H	NC 73 (Mt. Pleasant Hwy)	Mount Pleasant Bypass - Stanly County	Cabarrus County	2.7	24	2	60	55	12900	5400	8700	7100	16500	4-C		110		B	Reg	
	NC 150 (Mooresville Rd)	Iredell Co - Graham Rd (SR 1547)	Rowan County	5.1	22	2	60	55	14600	5400	6800	8700	14600	2-A		60		Maj	Reg	
	NC 150 (Mooresville Rd)	Graham Rd (SR 1547) - White Rd (SR 1737)	Rowan County	2.4	22	2	60	55	14600	3800	4600	6200	14600	2-A		60		Maj	Reg	
CR-000X-H	NC 150 (Mooresville Rd)	White Rd (SR 1737) - Briggs Rd (SR 1728)	Rowan County	2.6	18	2	60	55	13600	3900	5400	5900	14600	2-A		60		Maj	Reg	
CR-000X-H	NC 150 (Mooresville Rd)	Briggs Rd (SR 1728) - Quail Dr (SR 1600)	Rowan County	2.6	18	2	60	55	13600	5700	6600	9500	40500	4-F		100		B	Reg	
CR-000X-H	NC 150 (Mooresville Rd)	Quail Dr (SR 1600) - Candlewick Dr (SR 1825)	Salisbury	1.2	20	2	60	50	11700	11000	12100	18000	40000	4-G		110		B	Reg	
CR-000X-H	NC 150 (Mooresville Rd)	Candlewick Dr (SR 1825) - Grants Creek	Salisbury	0.3	22	2	60-100	45	11800	15000	15100	19400	40000	4-G		110		B	Reg	
	NC 150 (Mooresville Rd)	Grants Creek - US 70 (Jake Alexander Blvd W)	Salisbury	0.6	64	5	100-110	35	24300	14000	16400	17100	24300	5-A		100-110		Maj	Reg	
	NC 150 (Mooresville Rd)	US 70 (Jake Alexander Blvd W) - US 29 (Main St)	Salisbury	0.7	26	2	100	35	11100	5700	5600	6300	11100	2-B		100		Maj	Reg	
	NC 150	Concurrent with US 29																		
CR-000X-H	NC 152 W	Iredell Co - NC 152 Bypass W	Rowan County	8.1	24	2	100	55	15100	7300	8800	10400	15900	3-A		80		Maj	Reg	
CR-000X-H	NC 152 W (W Church St)	NC 152 Bypass W - China Grove Limits	Rowan County	1.7	24	2	100	55	15100	7700	7000	8100	14200	3-B		100		Maj	Sub	
CR-000X-H	NC 152 W (W Church St)	China Grove Limits - Miller Rd (SR 1509)	China Grove	0.4	24	2	100	45	12700	8600	8300	9600	12900	3-B		100		Maj	Sub	
CR-000X-H	NC 152 W (W Church St)	Miller Rd (SR 1509) - Mitchell Ave (SR 1569)	China Grove	0.2	24	2	100	35	11100	11000	11800	8700	12700	3-B		100		Maj	Sub	
CR-000X-H	NC 152 W (W Church St)	Mitchell Ave (SR 1569) - N Main St (SR 2739)	China Grove	0.2	36	2	50	35	11100	11000	11500	9100	11100	2-E		50	60	Maj	Sub	
CR-000X-H	NC 152 W (W Church St)	N Main St (SR 2739) - US 29	China Grove	0.7	40	2	50	35	11100	9800	11500	9400	11100	2-E		50	60	Maj	Sub	
	NC 152 E	Concurrent with US 29	China Grove	0.7																
	NC 152 E	US 29 - I-85	China Grove	0.3	40	4	180	45	24600	11000	14100	10700	24600	4-C		180		Maj	Sub	
CR-000X-H	NC 152 E	I-85 - NC 152 Bypass (SR 2553)	China Grove	1.5	20	2	60	55	13600	8800	11500	11200	35100	4-D		110		B	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	NC 152 E	NC 152 Bypass (SR 2553) - Old Concord Rd (SR 1002)	Rowan County	1.0	20	2	60	55	14100	8100	10900	13200	40500	4-E		110		B	Reg	
CR-000X-H	NC 152 E	Old Concord Rd (SR 1002) - Faith Rd (SR 1006)	Rowan County	3.9	24	2	60	55	15100	6100	10400	9200	40500	4-E		110		B	Reg	
CR-000X-H	NC 152 (China Grove Hwy)	Faith Rd (SR 1006) - Rockwell City Limits	Rowan County	2.0	24	2	60	45	14600	7200	9600	10400	40500	4-E		110		B	Reg	
CR-000X-H	NC 152 (China Grove Hwy)	Rockwell City Limits - Shinn St	Rockwell	0.1	24	2	50	45	12200	5700	9000	8200	35100	4-B		110		B	Reg	
CR-000X-H	NC 152 (China Grove Hwy)	Shinn St - Cannon St	Rockwell	0.2	24	2	50	35	11100	5100	7900	7300	35100	4-B		110		B	Reg	
CR-000X-H	NC 152 (China Grove Hwy)	Cannon St - US 52 (W Main St)	Rockwell	0.4	36	2	50	35	11100	4300	6500	6200	28100	4-B		110		B	Reg	
CR-000X-H	NC 152 Ext. (Market St)	US 52 (W Main St) - Palmer Rd (SR 2341)	Rockwell	0.3	18	2	50	45	11000	1700	2300	2000	28100	4-D		110		B	Reg	
CR-000X-H	NC 152 Ext.	Palmer Rd (SR 2341) - US 52 Bypass	Rockwell	0.8		-	-	-	-	-	-	1100	28100	4-D		110		B	Reg	
CR-000X-H	NC 152 Bypass (Goodman Rd)	W NC 152 - Goodman Rd (SR 1210)	Rowan County	0.5	18	2	60	45	13100	-	-	5200	16500	3-A		80		B	Reg	
CR-000X-H	NC 152 Bypass	Goodman Rd (SR 1210) - Mt. Hope Church Rd (SR 1505)	Rowan County	4.7		-	-	-	-	-	-	5600	16500	3-A		80		B	Reg	
CR-000X-H	NC 152 Bypass	Mt. Hope Church Rd (SR 1505) - Menius Rd (SR 2553)	Rowan County	1.6	18	2	60	55	13600	-	-	4700	16500	3-A		80		B	Reg	
CR-000X-H	NC 152 Bypass	Menius Rd (SR 2553) - E NC 152	Rowan County	0.8	18	2	60	45	13100	1400	-	4000	16500	3-A		80		B	Reg	
CR-000X-H	NC 153	W NC 152 - Cannon Farm Rd (SR 1197)	Rowan County	2.2	22	2	60	55	14100	3500	4300	3300	15900	3-B		80		Maj	Reg	
CR-000X-H	NC 153 (W Rice St)	Cannon Farm Rd (SR 1197) - Main St (SR 2739)	Landis	1.3	35	2	50	35	11100	4800	6000	5900	12700	3-B		80		Maj	Reg	
	NC 200	Stanly Co - US 601	Cabarrus County	3.1	24	2	60	55	15100	4700	7000	10100	15100	3-A		90		Maj	Reg	
	NC 801	Iredell Co - Bear Poplar Rd (SR 1547)	Rowan County	5.8	28	2	60	55	15100	3700	5800	7000	15100	2-A		60		Maj	Reg	
	NC 801	Bear Poplar Rd (SR 1547) - Sherrills Ford Rd (SR 1526)	Rowan County	2.2	24	2	60	55	15100	3300	4000	5000	15100	2-A		60		Maj	Reg	
	NC 801	Sherrills Ford Rd (SR 1526) - US 70 (Statesville Blvd)	Rowan County	1.8	32	2	100	35	11100	5300	5400	7900	11100	2-A		100		Maj	Reg	
	NC 801	Concurrent with US 70	Rowan County																	
	NC 801	US 70 (Statesville Blvd) - Woodleaf Rd (SR 2048)	Rowan County	3.6	24	2	100	55	15100	3300	5300	4700	15100	2-A		100		Maj	Reg	
	NC 801	Woodleaf Rd (SR 2048) - Davie Co	Rowan County	3.2	20	2	100	55	14100	4000	7000	5600	14100	2-A		100		Maj	Reg	
CR-000X-H	Airport Rd-Homer Corriher Rd Connector (SR 1198)	NC 153 - Cannon Farm Rd (SR 1197)	Landis	0.8	20	2	60	45	11400	-	-	1200	15100	2-A		60		Min	Sub	
CR-000X-H	Airport Rd-Homer Corriher Rd Connector	Cannon Farm Rd (SR 1197)- West A St (SR 1100)	Landis	1.0		-	-	-	-	-	-	1300	11700	2-A		60		Min	Sub	
CR-000X-H	Airport Rd-Homer Corriher Rd Connector (SR 1182)	West A St (SR 1100) - Main St (SR1008)	Landis	0.6	16	2	60	35	9200	300	-	1200	10200	2-A		60		Min	Sub	
CR-000X-H	Airport Parkway	US 29 - Airport Road (SR 1516)	Salisbury	1.1	20	2	60	45	11400	1700	-	2600	11400	4-D		110		B	Sub	
CR-000X-H	Airport Parkway	Airport Rd (SR 1516) - National Guard Armory Road (SR 1625)	Salisbury	0.9	24	2	60	35	11100	-	-	9300	35100	4-D		110		B	Sub	
CR-000X-H	Airport Parkway	National Guard Armory Road (SR 1625) - Rowan Mill Rd (SR 1526)	Salisbury	0.6	-	-	-	-	-	-	-	9300	28100	4-D		110		B	Sub	
CR-000X-H	Airport Parkway	Rowan Mill Rd (SR 1526) - NC 150 (Mooresville Rd)	Salisbury	0.4	24	2	40	35	10200	-	-	7400	28100	4-D		110		B	Sub	
CR-000X-H	Airport Parkway	NC 150 (Mooresville Rd) -US 70 (Jake Alexander Blvd)	Salisbury	1.2	-	-	-	-	-	-	-	6000	28100	4-D		110		B	Sub	
CR-000X-H	Airport Rd (SR 1514)	NC 150 (Mooresville Rd) - Miller Chapel Rd (SR 1514)	Rowan County	0.7	20	2	60	45	10900	3500	5300	3000	12200	2-A		60		Min	Sub	
CR-000X-H	Airport Rd (SR 1514)	Miller Chapel Rd (SR 1514) - Grants Creek	Rowan County	0.9	20	2	60	45	10900	3500	5600	3600	12200	2-A		60		Min	Sub	
CR-000X-H	Airport Rd. (SR 1516)	Grants Creek - US 29 (S Main St)	Salisbury	1.9	20	2	60	45	10900	4200	4500	1400	11700	2-E		60		Min	Sub	
~~CR-000X-H~~	~~Airport Rd. Extension~~	~~US 29 (S. Main St) - Peach Orchard Rd (SR 2539)~~	~~Rowan County~~	~~0.8~~	-	-	-	-	-	-	-	~~1800~~	~~12200~~	~~2-A~~		~~60~~		~~Min~~	~~Sub~~	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Amity Hill Rd (SR 1001)	Iredell Co - US 70 (Statesville Blvd)	Rowan County	4.7	20	2	60	55	13600	3000	3500	4100	14600	2-A		60		Min	Sub	
CR-000X-H	Andrews St. (SR 1915)	Spencer City Limits - Long St (SR 2100)	East Spencer	0.1	16	2	60	35	9200	5200	-	4400	9200	2-E		60		Min	Sub	
CR-000X-H	Andrews St. (SR 1915)	Long St (SR 2100) - I-85	East Spencer	1.0	36	2	60	35	10200	8000	4400	7700	10200	2-E		60		Min	Sub	
CR-000X-H	Anthony Rd Ext. (SR 2382)	US 52 - US 52 Bypass	Rockwell	0.5	-	-	-	-	-	-	-	900	10200	2-A		60		Min	Sub	
	Archibald Rd (SR 1153)	Rocky River Rd (SR 1139) - Zion Church Rd (SR 1152)	Concord	1.1	18	2	60	55	13100	2000	5100	4600	13100	2-A	2-A	60	60	Min	Sub	
	Artz Rd (SR 2319)	Mt. Hope Church Rd (SR 1505) - Faith Rd (SR 1006)	Faith	1.2	20	2	60	55	14100	-	-	400	14100	2-A		60		Min	Sub	
	Arlington St. Extension	Ryan St - Old Concord Rd. (SR 1002)	Salisbury	0.9	-	-	-	-	-	-	-	400	10200	2-E		60		Min	Sub	
	Arlington St	Old Concord Rd. (SR 1002) - Innes St (SR 2200)	Salisbury	0.6	48	4	100	35	22200	-	-	600	22200	4-C	ADQ	100		B	Sub	
	Arlington St	Innes St (SR 2200) - Park Ave	Salisbury	0.3	24	2	50	35	10200	-	-	400	10200	2-E	2-E	50	60	Min	Sub	
	Baker Mill Rd (SR 1957)	Third Creek Church Rd (SR 1973) - Cool Springs Rd (SR 1003)	Rowan County	2.9	18	2	60	45	13100	-	-	1100	13100	2-A		60		Min	Sub	
	Bank St (SR 2314)	Granite Quarry city limits - US 52 (MAIN ST)	Granite Quarry	0.1	18	2	60	35	9200	2100	2700	5600	9200	2-E		60		Min	Sub	
	Bank St. (Salisbury)	Ellis St. - US 29 (Main St)	Salisbury	0.3	24	2	50	25	10000	-	-	5000	10000	2-H	ADQ	50		Min	Sub	
	Bank St. (Salisbury)	US 29 (Main St) - Long St (SR 1002)	Salisbury	0.3	24	2	50	25	10000	-	-	5000	10000	2-H	ADQ	50		Min	Sub	
CR-000X-H	Barger Rd (SR 2377)	Gold Knob Rd (SR 2375) - Trexler Rd (SR 2378)	Rowan County	0.9	18	2	60	55	13600	1200	1300	1100	14600	2-A		60		Min	Sub	
	Barrier Store Road (SR 2622)	Mt Pleasant Rd (SR 1006) - Stanly County	Cabarrus County	3.5	20	2	60	45	13600	1100	2500	1700	13600	2-B		60		Min	Sub	
CR-000X-H	Barringer Rd (SR 1728)	NC 150 (Mooresville Rd) - Sherrills Ford Rd (SR 1526)	Rowan County	1.5	22	2	60	55	14600	3600	4500	4700	14600	2-A		60		Min	Sub	
CR-000X-H	Beard Rd (SR 2893)	Mecklenburg Co - Cox Mill Rd	Concord	0.2	18	2	40	45	11000	-	-	15200	16500	3-C		80		Min	Sub	
	Bendix Drive Extension	Bendix Drive to Gold Hill Rd	Salisbury												2-E		60			
	Bernhardt Rd (SR 1512)	Grace Church Rd (SR 1503) - Miller Chapel Rd (SR 1514)	Rowan County	1.5	20	2	60	45	13600	-	-	1400	13600	2-A		60		Min	Sub	
	Bethel School Rd (SR 1120)	US 601 S - Midland Rd (SR 1221)	Cabarrus County	1.0	24	2	60	45	13600	-	7600	2700	13100	2-A		60		Min	Sub	
	Bethel School Rd Extension	US 601 to Northside Avenue Ext	Cabarrus County												2-E		60	Min	Sub	
CR-000X-H	Blackwelder Rd (SR 1307)	NC 49 - Roberta Rd (SR 1304)	Harrisburg	1.2	18	2	60	45	11000	700	2400	2400	13100	3-B	3-C	80		B	Sub	
	Bostian Rd (SR 1221)	Old Beatty Ford Rd (SR 1210) - S US 29	Rowan County	1.0	18	2	60	45	11000	500	1000	2000	11000	2-A		60		Min	Sub	
	Brantley Rd (SR 2000)	Lane St (SR 2180) - Midlake Rd (SR 2198)	Kannapolis	1.9	22	2	50	45	11300	3400	6500	4300	11300	2-B	2-E	50	60	Min	Sub	
	Brantly Rd (SR 2000)	Midlake Rd (SR 2198) - Old Salisbury Rd (SR 1002)	Kannapolis	2.0	22	2	50	45	11300	2000	3700	2400	11300	2-B	2-E	50	60	Min	Sub	
CR-000X-H	Brenner Ave	US 70 (Statesville Blvd) - Hedrick St	Salisbury	0.5	18	2	50	35	9200	7000	8700	13300	24300	3-B		80		Min	Sub	
CR-000X-H	Brenner Ave	Hedrick St - US 601 (Jake Alexander Blvd)	Salisbury	1.1	18	2	80	35	9200	13000	13500	24300	24300	3-B		80		Min	Sub	
CR-000X-H	Briggs Rd (SR 1728)	Sherrills Ford Rd (SR 1526) - US 70 (Statesville Blvd)	Rowan County	2.2	22	2	60	55	12500	2500	4200	3900	12200	2-A		60		Min	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Bringle Ferry Rd. Ext	US 29 (N Main St) - Long St (SR 1002)	Salisbury	0.2	-	-	-	-	-	-	-	4000	11700	3-B		80		Min	Sub	
CR-000X-H	Bringle Ferry Rd. (SR 1002)	Long St. (SR 1002) - Shaver St.	Salisbury	0.1	30	2	50-60	35	10200	5100	7000	5200	11700	3-B		80		Min	Sub	
	Bringle Ferry Rd. (SR 1002)	Shaver St - Newsome Rd	Salisbury	0.9	28	2	50-70	35	10200	4600	5800	4300	10200	2-E		50-70		Min	Sub	
	Bringle Ferry Rd. (SR 1002)	Newsome Rd - Bankett Rd (SR 2242)	Salisbury	0.4	28	2	80	35	10200	4300	6100	4300	10200	2-A		80		Min	Sub	
	Bringle Ferry Rd. (SR 1002)	Bankett Rd (SR 2242) - Earnhardt Rd (SR 2126)	Rowan County	0.3	28	2	80	45	12200	5800	6300	4600	12200	2-A		80		Min	Sub	
	Bringle Ferry Rd (SR 1002)	Earnhardt Rd (SR 2126)- Providence Church Rd (SR 2134)	Rowan County	3.7	28	2	80	45	14600	4300	8500	4400	14600	2-A		80		Min	Sub	
	Bringle Ferry Rd (SR 1002)	Providence Church Rd (SR 2134) - St Matthews Church Rd (SR 2340)	Rowan County	7.8	24	2	80	55	15100	3600	5200	4600	15100	2-A		80		Min	Sub	
	Bringle Ferry Rd (SR 1002)	St Matthews Church Rd (SR 2340) - Richfield Rd (SR 1005)	Rowan County	0.4	24	2	80	55	15100	1200	2500	1700	15100	2-A		80		Min	Sub	
	Bringle Ferry Rd (SR 1002)	Richfield Rd (1005) - Davidson Co	Rowan County	0.9	24	2	60	55	15100	1200	1800	1700	15100	2-A		60		Min	Sub	
CR-000X-H	Broadway Avenue Extension	US 601 - NC 24/27	Midland		-	-	-	-	-	-	-	300	12200	2-E		60		Min	Sub	
CR-000X-H	Brookwood Ave	McGill Ave - Harris St	Concord	0.3	-	-	-	-	-	-	-	1300	10200	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Brookwood Ave	Harris St - NC 73 (Church St)	Concord	0.7	30	2	50	35	10200	3600	-	5000	10200	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Brookwood Ave	NC 73 (Church St) - Burrage Rd	Concord	1.1	30	2	60	35	10200	1600	4500	8000	10200	3-C	3-C	80	80	Min	Sub	
	Brown Rd (SR 1211)	W NC 152 - Millbridge Rd (SR 1350)	Rowan County	3.0	22	2	60	45	14100	1400	2900	1400	14100	2-A		60		Min	Sub	
	Brown Street (SR 1505)	W 3rd St - Main St (SR 1006)	Faith	0.4	22	2	40	35	9900	1500	1800	1800	9900	2-C		40	50	Min	Sub	
CR-000X-H	Bruton Smith Boulevard (SR 2894)	US 29 - ZMAX Raceway	Concord	0.6	68	5	120	55	28400	20000	29600	27100	42200	6-E	6-F	130	130	Maj	Sub	
CR-000X-H	Bruton Smith Boulevard (SR 2894)	ZMAX Raceway - I-85	Concord	1.4	48	4D	150	35	28100	34000	58800	44700	42200	6-E	6-F	130	130	Maj	Sub	
CR-000X-H	Buffalo Ave	McGill Ave - NC 73 (Church St)	Concord	0.2	30	2	40	35	10200	8700	11800	11000	10200	2-G		85		Min	Sub	
CR-000X-H	Burrage Rd	Old Salisbury-Concord Rd (SR 1002) - Brookwood Ave	Concord	0.9	28	2	50	35	10200	2700	7300	1000	11700	2-E		60		Min	Sub	
CR-000X-H	Burrage Rd	Brookwood Ave - NC 3 (Branchview Dr)	Concord	1.3	24	2	60	35	10200	2900	7900	1900	11700	2-E		60		Min	Sub	
CR-000X-H	Burrage Rd	NC 3 (Branchview Dr) - Lake Concord Rd	Concord	0.6	24	2	60	35	10200	3100	6100	3700	11700	2-E		60		Min	Sub	
	Cabarrus Ave (SR 1002)	US 29 (Concord Pkwy) - US 601 (Warren Coleman Blvd)	Concord	0.2	60	5	100	35	24300	18000	20400	19600	24300	5-A		100		Maj	Sub	
	Cabarrus Ave (SR 1002)	US 601 (Warren Coleman Blvd) - Old Charlotte Rd	Concord	0.9	45	2D	60	35	14000	11000	24200	11500	14000	2-J	2-J	90	90	B	Sub	
CR-000X-H	Cabarrus Ave (SR 1002)	Old Charlotte Rd - Kerr St	Concord	0.5	40	2	60	35	11100	13000	37600	18000	14000	2-J	2-J	90	90	B	Sub	
CR-000X-H	Cabarrus Ave (SR 1002)	Kerr St - NC 73 (Union St)	Concord	0.5	40	2	60	35	11100	8800	13800	15600	14000	2-J	2-J	90	90	B	Sub	
CR-000X-H	Cabarrus Ave (SR 1002)	NC 73 (Union St) - NC 3	Concord	0.8	32	2	50	35	11100	6800	10600	11600	14000	2-J	2-J	90	90	B	Sub	
	Cabarrus Station Rd (SR 1121)	Mecklenburg Co - Midland Rd (SR 1221)	Midland	2.2	24	2	60	45	12200	7300	3100	24900	12200	2-A		60		Min	Sub	
	Cal Bost Rd (SR 1143)	Helmdale Ext - US 601	Cabarrus County	2.2	24	2	60	45	12200	7300		24300	12200	2-A		60		Min	Sub	
CR-000X-H	Caldwell Rd (SR 1173)	Tom Query Rd (SR 1166) - NC 49	Harrisburg	0.9	20	2	60	45	11400	7300	14700	27900	35100	4-D		110		B	Sub	
CR-000X-H	Caldwell Connector	NC 49 - Hudspeth Rd (SR 1302)	Concord	1.5	-	-	-	-	-	-	-	5300	35100	4-D		110		B	Sub	
CR-000X-H	Caldwell Connector	Hudspeth Rd (SR 1302) - US 29 (Concord Pkwy)	Concord	0.8	18	2	45	35	9200	-	-	5600	35100	4-D	4-D	110	110	B	Sub	
CR-000X-H	Caldwell Connector	US 29 (Concord Pkwy) - Weddington Rd Ext (SR 1431)	Concord	1.3	-	-	-	-	-	-	-	10700	35100	4-D	4-D	110	110	B	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	Caldwell Rd (SR 1547)	Millbridge Rd (SR 1547)- NC 150 (Mooresville Hwy)	Rowan County	1.9	22	2	60	45	14100	1100	1600	1500	14100	2-A		60		Min	Sub	
	Cannon Blvd (SR 2664)	NC 152 - I-85	China Grove	0.9	48	4D	275	55	40000	9900	23300	7300	40000	4-A		275		F	Sub	
	Cannon Farm Rd (SR 1197)	Enochville Ave (SR 1351) - NC 153 (Rice St)	Rowan County	2.8	24	2	60	45	12200	2600	3500	2900	12200	2-A		60		Min	Sub	
	Cauble Rd (SR 1911)	US 601 - E Ridge Rd (SR 1915)	Rowan County	2.8	18	2	60	45	13100	1000	-	2400	13100	2-A		60		Min	Sub	
	Cemetery St.	Fulton St - Caldwell St	Salisbury	0.2	28	2	40	20	10000	-	-	100	10000	2-E		40	60	Min	Sub	
CR-000X-H	Centergrove Rd (SR 2114)	Dale Earnhardt Blvd (SR 2126) - Midlake Rd (SR 2198)	Kannapolis	1.1	20	2	40	45	11400	6200	9200	6100	12200	2-E		60		Min	Sub	
CR-000X-H	Centergrove Rd (SR 2114)	Midlake Rd (SR 2198) - Camp Julia Rd (SR 2119)	Kannapolis	0.9	20	2	40	45	11400	2500	4700	2200	12200	2-E		60		Min	Sub	
CR-000X-H	Centergrove Rd (SR 2114)	Camp Julia Rd (SR 2119) - Penninger Rd (SR 2113)	Kannapolis	1.7	22	2	50	45	14100	1200	5300	1000	14100	2-E	2-E	60	60	Min	Sub	
CR-000X-H	Central Dr	NC 73 - US 29	Concord	0.3	19	2	40	45	10700	3400	-	7800	13100	3-C	3-C	80	80	Min	Sub	
	Chapel St (SR 1464)	US 29 (Cannon Blvd) - Beaver St	Landis	0.5	28	2	60	35	10200	4200	2900	4700	10200	2-D	2-E	60	60	Min	Sub	
	Chapel St (SR 1464)	Beaver St - Rice St	Landis	0.4	35	2	50	35	10200	3000	3100	2200	10200	2-E		50	60	Min	Sub	
	Chapel St (SR 1464)	Rice St - Ryder Ave (SR 1210)	Landis	0.3	28	2	50	35	10200	2500	3600	2600	10200	2-E		50	60	Min	Sub	
CR-000X-H	Charles St (SR 2026)	3rd St - US 29	Spencer	1.2	24	2	45	35	10200	1000	-	1300	11700	3-B		80		Min	Sub	
CR-000X-H	Chestnut Dr	Lincoln St - NC 73 (Union St)	Concord	0.2	20	2	40	35	9500	500	400	900	10200	2-E		60		Min	Sub	
	China Grove Rd (SR 2202)	Brantley St (SR 2000) - Rowan County	Kannapolis	0.7	18	2	50	45	10500	600	1300	500	10500	2-E		60		Min	Sub	
	China Grove Rd (SR 1238)	Cabarrus County – Moose Rd (SR 1308)	Kannapolis	0.4	18	2	60	45	10500	1500	2800	800	10500	2-E		60		Min	Sub	
	China Grove Rd (SR 1238)	Moose Rd (SR 1308) - Old Beatty Ford Rd (SR 1221)	Rowan County	1.4	22	2	60	45	14100	1400	4000	1000	14100	2-A		60		Min	Sub	
	China Grove Rd (SR 1238)	Old Beatty Ford Rd (SR 1221) - US 29 (Cannon Blvd)	Rowan County	1.9	22	2	60	45	14100	1100	2800	2300	14100	2-A		60		Min	Sub	
CR-000X-H	Christenbury Pkwy (SR 1447)	Derita Rd (SR 1445) - Cox Mill Rd (SR 1448)	Concord	0.4	48	4D	110	45	35100	-	8600	16900	35100	4-C		110		B	Sub	
CR-000X-H	Christenbury Pkwy (SR 1447)	Cox Mill Rd (SR 1448) - Mecklenburg County	Concord	0.9	24	2	80	55	14600	8000	8400	32000	35100	4-C		110		B	Sub	
	Church St	Monroe St - Horah St	Salisbury	0.2	24	2	50	35	10200	-	-	600	10200	2-E		50	60	Min	Sub	
	Church St	Horah St - Liberty St	Salisbury	0.6	28	1-w	50	35	10200	-	-	1200	10200	1-w	2-E	50	60	Min	Sub	
	Church St	Liberty St - Cemetary St	Salisbury	0.2	35	2	50	35	10200	-	-	600	10200	2-G	2-E	50	60	Min	Sub	
CR-000X-H	Cold Springs Rd (SR 2411)	NC 73 - Mt. Pleasant Rd (SR 1006)	Cabarrus County	5.3	20	2	50	45	13600	2300	4700	3700	13600	3-A		90		Min	Sub	
	Coley Rd (SR 2316)	S. Main St (SR 2300) - Stone Rd (SR 2315)	Granite Quarry	1.2	20	2	60	45	10900	1200	-	1400	10900	2-B	2-E	60		Min	Sub	
CR-000X-H	Concord Mills Blvd (SR 2894)	Derita Rd (SR 1445) - I-85	Concord	1.1	48	4D	120	45	35100	42000	47800	58800	52800	6-F	6-F	130	130	B	Sub	
	Concordia Church Rd (SR 1353)	W NC 152 - Corriher Springs Rd (SR 1554)	Rowan County	0.9	16	2	60	45	13100	-	600	400	13100	2-A		60		Min	Sub	
	Cool Springs Rd (SR 1003)	Iredell Co - Depot Rd (SR 1003)	Rowan County	9.2	21	2	60	45	13600	1400	1100	2000	13600	2-A		60		Min	Sub	
	Cool Springs Rd (SR 2048)	Depot Rd (SR 1003) - NC 801	Rowan County	1.2	24	2	60	45	14600	2200	2600	3100	14600	2-A		60		Min	Sub	
	Copperfield Blvd	I-85 - NC 3 (Branchview Dr)	Concord	1.7	60	5	80	35	26000	17000	27200	22200	26000	5-A	5-A	100	100	Maj	Sub	

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CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Corban Ave	Powder St - NC 73 (Church St)	Concord	0.8	30	2	40	35	10200	6600	12900	7000	22200	2-H	2-H	75	75	Min	Sub	
	Correll St (SR 2114)	Long St (SR 2100) - City Limits	East Spencer	0.6	20	2	40	35	9500	1700	5100	2600	9500	2-C		40	50	Min	Sub	
	Corriher Springs Rd (SR 1554)	Concordia Church Rd (SR 1353) - Millbridge Rd (SR 1350)	Rowan County	1.4	16	2	60	45	10500	700	700	1000	10500	2-A		60		Min	Sub	
	Council St	Ellis St. - N Salisbury St	Salisbury	0.3	30	1-w	40	35	10200	-	-	200	10200	2-H		40	75	Min	Sub	
	Council St	Church St - Arlington St	Salisbury	0.5	30	2	50	35	10200	-	-	200	10200	2-H		50	75	Min	Sub	
CR-000X-H	Country Club Rd	US 29 (Concord Pkwy) - NC 3 (Branchview Dr)	Concord	0.6	30	2	40	35	10200	8400	8500	8800	11700	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Cox Mill Rd (SR 1448)	Poplar Tent Rd (SR 1394) - Rocky River	Cabarrus County	1.5	18	2	40	55	13100	6200	10400	9800	13200	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Cox Mill Rd (SR 1448)	Rocky River - Christenbury Pkwy (SR	Concord	0.8	20	2	60	55	13600	6200	17400	8800	13200	3-C	3-C	80	80	Min	Sub	
	Crescent Rd (SR 2319)	Faith Rd (SR 1006) - US 52	Faith	2.5	22	2	60	45	14100	3200	2400	3500	14100	2-A		60		Min	Sub	
	Crestmont Dr (SR 2643)	Old Airport Rd (SR 2635)- NC 73	Concord	2.0	16	2	40	35	9200	1200	500	1900	9200	2-C		50		Min	Sub	
	Cruse Rd (SR 2551)	Safrit Rd (SR 2547) - Old Concord Rd (SR 1002)	Rowan County	1.2	16	2	60	45	13100	600	900	800	13100	2-A		60		Min	Sub	
	Deal Rd (SR 1353)	Iredell Co - Wright Rd (SR 1359)	Rowan County	2.3	20	2	60	45	13600	1500	2800	2000	13600	2-A		60		Min	Sub	
	Deal Rd (SR 1353)	Wright Rd (SR 1359)- NC 152	Rowan County	2.1	20	2	60	45	13600	2500	5000	2800	13600	2-A		60		Min	Sub	
CR-000X-H	Dakota St	Ridge Ave – US 29	Kannapolis	0.6	18	2	60	35	10500	1400	-	2100	10200	2-E		60		Min	Sub	
CR-000X-H	Dale Earnhardt Blvd (SR 2126)	Concord City Limits - NC 3 (Concord Lake Road)	Kannapolis	1.0	60	5	90	35	24300	17000	23700	22800	36600	4-D		110		Maj	Sub	
	Davidson Rd (SR 1608)	Mecklenburg Co - NC 3 (Mooresville Hwy)	Cabarrus County	2.2	24	2	60	45	12200	7300	3100	3800	13600	2-A		60		Min	Sub	
	Davidson Rd	Odell School Rd to NC 3	Kannapolis												3-C		80			
CR-000X-H	Derita Rd (SR 1445)	Mecklenburg County - Poplar Tent Rd (SR 1394)	Concord	2.8	18	2	60	45	11000	13000	16000	26500	36600	4-C		110		B	Sub	
CR-000X-H	Dickens Place Ext	Mullis Rd - Dickens Place	Cabarrus County	1.1	-	-	-	-	-	-	-	4500	9200	3-B	3-C	80		Min	Sub	
	Doby Dr (SR 2351)	Old NC 80 (SR 2350) - US 52	Rowan County	0.1	18	2	60	35	9200	700	-	1000	9200	2-A		60		Min	Sub	
	Dogwood Blvd	Trinity Church Rd (SR 1622) - Kannapolis Pkwy (SR 1624)	Kannapolis	1.0	22	2	60	45	14100	400	1700	1200	14100	2-B	2-E	60		Min	Sub	
	Drakestone Rd (SR 1622)	Stirewalt Rd (SR 1616) - Trinity Church Rd (SR 1622)	Cabarrus County	0.7	18	2	40	45	13100	2000	4400	2100	13100	2-C		50		Min	Sub	
	Dunns Mountain Rd (SR 2131)	US 52 (S Salisbury Ave) - Stokes Ferry Rd (SR 1004)	Granite Quarry	1.4	20	2	60	35	9500	2300	3200	2700	9500	2-A		60		Min	Sub	
	Dunns Mountain Rd (SR 2131)	Stokes Ferry Rd (SR 1004)- Bringle Ferry Rd (SR 1002)	Rowan County	1.8	22	2	60	45	11800	2900	5000	5200	11800	2-A		60		Min	Sub	
	Dunn's Mtn Church Rd (SR 2126)	US 52 (S Salisbury Ave) - Stokes Ferry Rd (SR 1004)	Granite Quarry	0.9	22	2	60	35	9900	1300	-	1500	9900	2-C	2-A	60		Min	Sub	
	Earnhardt Rd (SR 2126)	Stokes Ferry Rd (SR 1004) - Jake Alexander Blvd E Ext	Rowan County	0.7	22	2	60	45	11800	800	-	100	11800	2-B		60		Min	Sub	
CR-000X-H	East Rowan Connector	Stone Rd (SR 2315) - St Lukes Church Rd (SR 2380)	Rowan County	1.8	-	-	-	-	-	-	-	5500	45200	4-E		180		B	Sta	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	East Rowan Connector	St Lukes Church Rd (SR 2380) - Bringle Ferry Rd (SR 1002)	Rowan County	3.0	20	2	60	55	13600	500	-	7600	45200	4-A		180		B	Sta	
CR-000X-H	East Rowan Connector	Bringle Ferry Rd (SR 1002) - I-85	Rowan County	2.8	-	-	-	-	-	-	-	8600	45200	4-A		180		B	Sta	
	Ebenezer Rd (SR 1267)	Ridge Ave - Moose Rd (SR 1308)	Kannapolis	0.4	22	2	40	35	9900	1300	3700	1500	9900	2-E		60		Min	Sub	
	Ebenezer Rd (SR 1267)	Moose Rd (SR 1308) - Troutman Hill Rd (SR 1267)	Rowan County	0.5	22	2	60	45	11800	900	1700	1600	11800	2-A		60		Min	Sub	
	Ebenezer Rd (SR 1322)	Troutman Hill Rd (SR 1267) - Old Beatty Ford Rd (SR 1221)	Rowan County	1.3	22	2	40	45	11800	900	2300	2100	11800	2-A		40	60	Min	Sub	
	Ellis St.	Monroe St. - Horah St.	Salisbury	0.1	24	2	45	25	10000	-	-	1200	10000	2-E		45	60	Min	Sub	
	Ellis St.	Horah St. - Bank St.	Salisbury	0.1	24	2	50	25	10000	-	-	1200	10000	2-E		50	60	Min	Sub	
	Ellis St.	Bank St. - Fisher St.	Salisbury	0.1	24	2	50	25	10000	-	-	1200	10000	2-E		50	60	Min	Sub	
	Ellis St.	Fisher St. - Innes St. (SR 2200)	Salisbury	0.1	24	2	50	25	10000	-	-	1200	10000	2-E		50	60	Min	Sub	
	Ellis St.	Innes St. (SR 2200) - Council St.	Salisbury	0.1	24	2	50	25	10000	-	-	1200	10000	2-E		50	60	Min	Sub	
	Ellis St.	Council St. - Liberty St.	Salisbury	0.1	24	2	50	25	10000	-	-	1200	10000	2-E		50	60	Min	Sub	
	Ellis St.	Liberty St. - Kerr St.	Salisbury	0.1	24	2	50	25	10000	-	-	1200	10000	2-E		50	60	Min	Sub	
	Emanuel Church Rd (SR 2338)	Old Beatty Ford Rd (SR 1221) - Johnson Dairy Rd (SR 2345)	Rowan County	1.3	18	2	60	45	13100	500	700	400	13100	2-A		60		Min	Sub	
	Emanuel Church Rd (SR 2338)	Johnson Dairy Rd (SR 2345) - Rockwell Limits	Rowan County	1.2	18	2	60	45	13100	1100	1300	500	13100	2-A		60		Min	Sub	
	Emanuel Church Rd (SR 2338)	Rockwell Limits - US 52 (Main St)	Rockwell	0.3	20	2	60	35	9500	1100	2000	500	9500	2-C		60		Min	Sub	
CR-000X-H	S Enochville Ave (SR 1351)	Westside Bypass - West C St (SR 1124)	Rowan County	0.6	20	2	60	45	11400	7800	10200	5700	13100	3-B		80		Min	Sub	
CR-000X-H	N Enochville Ave (SR 1351)	W C St (SR 1124) - Enochville Rd (SR 1104)	Rowan County	1.0	20	2	60	45	11400	6100	9900	3400	12200	2-A		60		Min	Sub	
CR-000X-H	N Enochville Ave (SR 1351)	Enochville Rd (SR 1104)- Westside Bypass	Rowan County	1.1	20	2	60	45	11400	4800	600	3300	12200	2-A		60		Min	Sub	
CR-000X-H	N Enochville Ave (SR 1351)	Westside Bypass - Deal Rd (SR 1353)	Rowan County	1.4	22	2	60	55	14100	1100	1500	1400	12200	2-A		60		Min	Sub	
	Enochville Rd (SR 1104)	Enochville Ave (SR 1351) - Kannapolis City Limits	Kannapolis	0.4	22	2	40	45	11800	-	2400	1000	11800	2-A	2-E	40	60	Min	Sub	
	Enochville Rd (SR 1104)	Kannapolis City Limits - West A St (SR 1100)	Kannapolis	1.6	22	2	60	35	9900	1400	3300	1200	9900	2-A	2-E	60	60	Min	Sub	
	Enochville School Rd (SR 1360)	Smith Rd (SR 1361) - Westside Bypass	Rowan County	0.5	18	2	60	45	11000	1100	2100	1700	11000	2-A		60		Min	Sub	
	Enochville School Rd (SR 1360)	Westside Bypass - N Enochville Ave (SR 1351)	Rowan County	0.6	18	2	60	35	13100	1700	2500	700	13100	2-A		60		Min	Sub	
	Enon Church Rd. (SR 1944)	US 70 (Statesville Blvd) - Woodleaf Rd (SR 2048)	Salisbury	1.3	24	2	70	45	12200	1600	2000	1900	12200	2-A		70		Min	Sub	
CR-000X-H	Evelyn Ave	Brantley Rd (SR 2000) - Lane St (SR 2180)	Kannapolis	0.2	22	2	30	35	9900	-	-	700	10200	2-E		60		Min	Sub	
CR-000X-H	Evelyn Ave	Lane St (SR 2180) - Rowan Co	Kannapolis	0.1	22	2	30	35	9900	-	-	700	10200	2-E		60		Min	Sub	
CR-000X-H	Evelyn Ave	Cabarrus Co - Moose Rd (SR 1308)	Kannapolis	0.3	22	2	50	35	9900	-	-	700	10200	2-E		60		Min	Sub	
CR-000X-H	Evelyn Ave Ext	Moose Rd (SR 1308) - Ebenezer Rd (SR 1322)	Kannapolis	0.9	--	--	--	--	-	-	-	700	10200	2-E		60		Min	Sub	
CR-000X-H	Faith Rd (SR 1006)	E NC 152 - Deal St (SR 2316)	Rowan County	2.3	24	2	60	45	12200	3500	3500	3300	14600	2-A		60		Min	Sub	
CR-000X-H	Faith Rd. (SR 1006)	Deal St (SR 2316) - N Faith Town Limits	Faith	1.0	24	2	60	35	10200	6600	7600	6400	12700	3-B		80		Min	Sub	
CR-000X-H	Faith Rd. (SR 1006)	N Faith Town Limits - St. Paul's Church Rd (2529)	Rowan County	0.5	24	2	60	45	12200	6200	10500	5000	13200	3-B		80		Min	Sub	
CR-000X-H	Faith Rd (SR 1006)	St. Paul's Church Rd (SR 2529) - Heilig Rd (SR 2528)	Granite Quarry	1.7	24	2	60	45	12200	7900	9200	9100	12200	2-A		60		Min	Sub	
CR-000X-H	Faith Rd. (SR 1006)	Heilig Rd. (SR 2528) - N. Main (SR 2300)	Rowan County	0.8	24	2	60	45	12200	5300	6700	6000	12200	2-A		60		Min	Sub	
CR-000X-H	Faith Rd. (SR 1006)	N. Main (SR 2300) - Stratford Dr	Salisbury	0.9	24	2	60	45	12200	6600	8800	8000	12700	2-D		90		Min	Sub	
CR-000X-H	Faith Rd. (SR 1006)	Stratford Dr - Avalon Dr	Salisbury	0.7	24	2	60	35	10200	11000	10000	12700	14600	3-B		80		Min	Sub	
CR-000X-H	Faith Rd. (SR 1006)	Avalon Dr - US 52 (Innes St)	Salisbury	0.4	36	3+	60+	35	10200	11000	11300	12400	14600	3-B		80		Min	Sub	

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CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
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Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	First St (SR 1706)	Ridge Ave - Rose Ave	Kannapolis	0.2	40	2	40	35	10200	3100	6100	5800	12500	2-I	2-L	85	80	Min	Sub	
CR-000X-H	First St (SR 1706)	Rose Ave - US 29 (Cannon Blvd)	Kannapolis	0.6	40	4	40	35	21900	3500	11100	6700	12500	2-I	2-L	85	80	Min	Sub	
CR-000X-H	First St (SR 1706)	US 29 (Cannon Blvd) - Little Texas Rd (SR 2154)	Kannapolis	0.7	20	2	40	35	9500	1700	3400	2400	10200	2-E		60		Min	Sub	
	Fisher Rd (SR 2320)	E NC 152 - Crescent Rd (SR 2319)	Rowan County	1.5	16	2	60	45	11000	1000	2000	1100	11000	2-A		60		Min	Sub	
	Fisher St	Ellis St - Fulton St	Salisbury	0.1	22	2	50	25	9700	-	-	200	9700	2-H		50	75	Min	Sub	
	Fisher St	Fulton St - Lee St	Salisbury	0.4	36	2	50	25	10000	-	-	200	10000	2-G	2-H	50	75	Min	Sub	
	Fisher St	Lee St - Long St (SR 2100)	Salisbury	0.3	24	2	40	25	10000	-	-	200	10000	2-H		40	75	Min	Sub	
	Flat Rock Rd (SR 1210)	Mt. Moriah Church Rd (SR 1197) - Patterson St (SR 1211)	Rowan County	1.6	22	2	60	45	11800	2200	2700	2900	11800	2-A		60		Min	Sub	
CR-000X-H	Flowes Store Rd (SR 1132)	NC 24/27 - US 601	Cabarrus County	3.0	24	2	60	45	14600	3200	-	5100	14600	3-A		90		Maj	Sub	
CR-000X-H	Forest St Ext	Caldwell Rd (SR 1173) - Forest St	Harrisburg	0.6	-	-	-	-	-	-	-	600	10200	2-A		60		Min	Sub	
CR-000X-H	Forest St Ext	Forest St - Sims Parkway	Harrisburg	0.3	16	-	35	20	9000	-	-	600	10200	2-A		60		Min	Sub	
	Fulton St	US 29 (Main St) - Lincolnton Rd	Salisbury	0.6	30	2	50	30	10000	-	-	500	10000	2-H		50	75	Min	Sub	
	Fulton St	Lincolnton Rd - Monroe St	Salisbury	0.3	24	2	50	30	10000	-	-	500	10000	2-H		50	75	Min	Sub	
	Fulton St	Monroe St - Innes St (SR 2200) -	Salisbury	0.4	30	2	50	30	10000	-	-	400	10000	2-H		50	75	Min	Sub	
	Fulton St	Innes St (SR 2200) - Kerr St	Salisbury	0.2	35	2	50	30	10000	-	-	500	10000	2-H		50	75	Min	Sub	
	Fulton St	Kerr St - Cemetery St	Salisbury	0.1	24	2	50	25	10000	-	-	500	10000	2-H		50	75	Min	Sub	
R-2246A	George Liles Pkwy (SR 1309)	NC 49 - Roberta Rd (SR 1304)	Concord	1.9	19	2	40	45	11200	3800	11900	7900	35100	4-A	4-A	180	180	B	Sub	
R-2246B	George Liles Pkwy (SR 1310)	Roberta Rd (SR 1304)- US 29 (Concord Pkwy)	Concord	1.7	20	2	40	35	11400	7700	21900	18300	28100	4-A	4-A	180	180	B	Sub	
	George Liles Pkwy	US 29 (Concord Pkwy) - Weddington Rd (SR 1431)	Concord	1.3	-	-	-	-	-	-	-	24700	35100	4-A	4-A	180	180	B	Sub	
	George Liles Pkwy (SR 1430)	Weddington Rd (SR 1431) - I-85	Concord	1.7	60-100	4D	90-250	50	12700	20000	47000	45500	43900	4-A	4-A	180	180	B	Sub	
	Gheen Rd (SR 1945)	Woodleaf Rd (SR 2048)- US 601 (Mocksville Hwy)	Rowan County	3.0	20	2	60	45	13600	700	800	800	13600	2-A		60		Min	Sub	
	Glover Rd (SR 2532)	Old Concord Rd (SR 1002) - St. Pauls Church Rd (SR 2532)	Rowan County	2.4	20	2	60	45	13600	600	1300	1300	13600	2-A		60		Min	Sub	
	Gold Hill Rd (SR 2408)	NC 73 - Mt. Pleasant Rd (SR 1006)	Cabarrus County	1.2	22	2	40	45	14100	2300	2300	3000	14100	2-B		40	60	Min	Sub	
	Gold Hill Dr	Old Concord Rd. (SR 1002) - Faith Rd (SR 1006)	Salisbury	0.9	20	2	50	35	9500	1800		2300	9500	2-C		50		Min	Sub	
CR-000X-H	Gold Knob Rd (SR 2375)	Upper Palmer Rd (SR 2341) - Barger Rd (SR 2377)	Rowan County	0.2	16	2	60	55	13100	1700	2100	1800	14600	2-A		60		Min	Sub	
	Goodman Lake Rd (SR 2168)	Bringle Ferry Rd (SR 1002) - Providence Church Rd (SR 2134)	Rowan County	2.3	22	2	60	45	14100	2900	-	1300	14100	2-A		60		Min	Sub	
	Goodman Lake Rd (SR 2168)	Providence Church Rd (SR 2134) - Long Ferry Rd (SR 2120)	Rowan County	2.2	22	2	60	45	14100	1100	800	800	14100	2-A		60		Min	Sub	
	Goodson Rd (SR 1954)	US 70 (Statesville Blvd) - Woodleaf Rd (SR	Rowan County	2.2	22	2	60	45	14100	900	1300	1300	14100	2-A		60		Min	Sub	
	Grace Church Rd (SR 1503)	Miller Rd (SR 1509) - Shue Rd (SR 1506)	Rowan County	1.0	20	2	60	45	13600	3400	4700	3500	13600	2-A		60		Min	Sub	
	Grace Church Rd (SR 1503)	Shue Rd (SR 1506) - US 29 (Main St)	Rowan County	2.3	22	2	60	55	14600	3000	3900	3200	14600	2-A		60		Min	Sub	
CR-000X-H	Graham Rd (SR 1547)	NC 150 (Mooresville Rd) - NC 801	Rowan County	3.2	18	2	60	55	13600	1000	2100	1800	14600	2-A		60		Min	Sub	
CR-000X-H	Granite Quarry Connector	US 52 - Dusty Lane	Rowan County	0.4	--	--	--	--	-	-	-	9200	14600	2-A		60		Min	Sub	
CR-000X-H	Granite Quarry Connector	Dusty Lane - US 52 Bypass	Rowan County	0.5	22	2	60	55	14600	5800	6600	10600	14600	2-A		60		Min	Sub	

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Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	Grove St	W. Innes St (SR 2200) - Mocksville Ave (SR 1910)	Salisbury	0.5	30	2	50	35	10000	-	-	2200	10000	2-H		50	75	Min	Sub	
CR-000X-H	Hall Rd (SR 1547)	NC 801 - Ketchie Rd (SR 1547)	Rowan County	2.2	18	2	60	55	13100	800	1400	1300	14600	2-A		60		Min		
CR-000X-H	Hall Rd (SR 1747)	1001)	Rowan County	1.6	18	2	60	55	13100	800	1300	1300	14600	2-A		60		Min		
CR-000X-H	Harris Rd (SR 1449)	Meck Co - Odell School Rd (SR 1442)	Concord	3.4	22	2	50	45	11800	13000	5900	25300	36600	4-C		110		B	Sub	
	Harrison Rd (SR 1710)	Sherrill's Ford Rd (SR 1526) - Executive Dr.	Salisbury	1.3	24	2	60	45	12200	7300	8400	8500	12200	2-A		60		Min	Sub	
	Harrison Rd (SR 1710)	Blvd)	Salisbury	1.0	24	2	60	45	12200	7300	7200	7400	12200	2-A		60		Min	Sub	
	Hawkinstown Rd. (SR 1912)	Old Mocksville Rd (SR 1910) - 7th St (SR 1914)	Rowan County	1.2	22	2	60	45	11800	1900	2400	1500	11800	2-B		60		Min	Sub	
CR-000X-H	Heilig Rd (SR 2528)	Old Concord Rd (SR 1002) Rd - Faith Rd (SR 1006)	Rowan County	1.0	22	2	60	55	14600	5800	6600	8600	16500	3-A	4-D	80	110	Min	Sub	
CR-000X-H	Heilig Rd. Extension	Faith Rd (SR 1006) - Main St (SR 2300)	Granite Quarry	0.7	--	--	--	--	-	-	-	5100	16500	3-B	4-D	80	110	Min	Sub	
CR-000X-H	Helmdale Rd Conn (SR 1181)	Flowe Store Rd (SR 1132) - Sam Black Rd (SR 1127)	Cabarrus County	0.8	24	2	50	25	10000	-	-	2100	10000	2-A		60		Min	Sub	
CR-000X-H	Helmdale Rd Conn (SR 1181)	Sam Black Rd (SR 1127) - Bethel Church Rd (SR 1125)	Cabarrus County	0.2	24	2	45	25	10000	-	-	1700	10000	2-A		60		Min	Sub	
CR-000X-H	Helmdale Rd Conn (SR 1181)	Bethel Church Rd (SR 1125) - Cal Bost Rd (SR 1143)	Cabarrus County	0.1	--	--	--	--	-	-	-	1300	10000	2-A		60		Min	Sub	
	Henderson St	Jackson St - US 29 (Main Street)	Salisbury	0.2	24	2	50	25	10000	-	-	1800	10000	2-E		50	60	Min	Sub	
	Henderson St	US 29 (Main Street) - Railroad St	Salisbury	0.2	24	2	45	25	10000	-	-	1900	10000	2-E	2-E	45	60	Min	Sub	
CR-000X-H	Henderson St Extension	Railroad St - Bringle Ferry Rd (SR 1002)	Salisbury	0.1	--	--	--	--	-	-	-	1800	10000	3-B		80		Min	Sub	
CR-000X-H	Henderson Grove Church Rd. Connector S	Airport Rd. Extension - Henderson Grove Rd (SR 1526)	Salisbury	0.4	--	--	--	--	-	-	-	2400	11700	2-A		60		Min	Sub	
CR-000X-H	Henderson Grove Church Rd. (SR 1526)	Extension S - Extension N	Salisbury	0.5	20	2	40-60	55	13600	1500	-	2400	11700	2-A		60		Min	Sub	
CR-000X-H	Henderson Grove Church Rd Connector N	Henderson Grove Rd (SR 1526) - Julian Rd. (SR 2528)	Salisbury	0.5	--	--	--	--	-	-	-	2400	11700	2-A		60		Min	Sub	
CR-000X-H	Hickory Ridge Rd (SR 1138)	Rocky River Rd (SR 1139)- Tom Query Rd Extension	Harrisburg	1.4	20	2	50	45	10900	5900	18000	15500	16400	4-G		110		B	Sub	
CR-000X-H	Hickory Ridge Rd (SR 1138)	Tom Query Rd Extension - Roberta Rd Ext (SR 1304)	Harrisburg	0.6	-	-	-	-	-	-	-	16000	16400	4-G		110		B	Sub	
	Hollywood Dr (SR 1915)	Third St (SR 1915) - E Ridge Rd (SR 1915)	Rowan County	1.6	24	2	60	45	12200	2500	4000	3200	12200	2-B		60		Min	Sub	
	Horah St.	US 29 (Main St) - Partee St	Salisbury	0.9	24	2	45	25	10000	-	-	700	10000	2-E		45	60	Min	Sub	
	Horah St.	Partee St. - Brenner Ave.	Salisbury	0.5	24	2	50	25	10000	-	-	700	10000	2-E		50	60	Min	Sub	
CR-000X-H	Hurley School Rd (SR 1724)	Sherrills Ford Rd (SR 1526) - US 70 (Statesville Blvd)	Rowan County	1.5	18	2	60	45	9200	-	2200	2600	11700	3-A		80		Min	Sub	
	Innes St. (SR 2200)	I-85 - Arlington Street	Salisbury	0.2	90-100	4D	99-125	35	26000	27000	30000	26500	26000	4-C		99-125		B	Sub	
	Innes St. (SR 2200)	Arlingon St - Norfolk Southern Main Line	Salisbury	0.5	60	5	80-100	35	24300	22000	18400	21000	24300	5-A		80-100		Maj	Sub	
	Innes St. (SR 2200)	Norfolk Southern Main Line - Fulton St	Salisbury	0.4	66	4	75-100	20	22100	20000	24300	18700	22100	(1)	ADQ	75-100		Maj	Sub	
	Innes St. (SR 2200)	Fulton St - Craige St	Salisbury	0.3	40	4	60-65	20	22100	17000	20000	14700	22100	(1)	ADQ	60-65		Maj	Sub	
	Innes St. (SR 2200)	Craige St - Statesville Blvd (SR 2094)	Salisbury	1.1	40	4	60-80	35	22200	16000	20500	13700	22200	(1)	ADQ	60-80		Maj	Sub	

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Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Innes St. (SR 2200)	Statesville Blvd (SR 2094) - Salisbury Limits	Salisbury	0.5	40	3	60-100	35	12700	8800	10400	8000	12900	3-B		80		Maj	Sub	
CR-000X-H	Innes St. (SR 2200)	Salisbury Limits - US 601 (Jake Alexander Blvd)	Salisbury	0.9	22	2	60-100	45	11100	5400	7400	3900	13800	3-B		80		Maj	Sub	
CR-000X-H	International Dr (SR 1429)	Poplar Tent Rd (SR 1394) - NC 73 (Davidson Hwy)	Concord	1.4	30	2	50	45	12200	11000	20400	27000	27600	2-L	2-L	80	80	B	Sub	
CR-000X-H	Irish Potato Rd (SR 2411)	NC 49/NC 73 - Gold Hill Rd (SR 2408)	Cabarrus County	4.4	20	2	40	45	11400	3300	4000	5400	11400	3-A		90		Min	Sub	
CR-000X-H	Irish Potato Rd (SR 2411)	Gold Hill Rd (SR 2408) - Old Salisbury Rd (SR 1002)	Cabarrus County	2.6	20	2	50	55	14100	2000	5200	3000	14100	3-A		90		Min	Sub	
CR-000X-H	Jackson Park Rd (SR 2000)	Main St (SR 1008) - US 29 (Cannon Blvd)	Kannapolis	0.6	40	4	60	45	23000	10000	15500	12100	23000	3-C		80		Maj	Sub	
	Jackson St	Jackson Park Rd - Carolyn Ave	Kannapolis	-	-	2	-	-	-	-	-	-	-	-	2-E	-	60	Min	Sub	
CR-000X-H	Jake Alexander Blvd. N	Hollywood Dr - (SR 1915) - Garrick Rd (SR 1996)	Rowan County	1.0	-	-	-	-	-	-	-	7900	36600	4-D		110		B	Sub	
CR-000X-H	Jake Alexander Blvd. N	Garrick Rd (SR 1996) - US 601 9 (W. Innes St)	Rowan County	2.4	-	-	-	-	-	-	-	7700	36600	4-D		110		B	Sub	
CR-000X-H	Jake Alexander Blvd. S (SR 1007)	I-85 - Stokes Ferry Rd (SR 1004)	Salisbury	1.7	64	5	100	45	27600	20000	14100	24000	35100	4-D		110		B	Sub	
CR-000X-H	Jake Alexander Blvd. E	Stokes Ferry Rd (SR 1004) - Bringle Ferry Rd (SR 1002)	Salisbury	2.0	-	-	-	-	-	-	-	15000	35100	4-D		110		B	Sub	
CR-000X-H	Jake Alexander Blvd. E	Bringle Ferry Rd (SR 1002) - East Rowan Connector	Rowan County	1.6	-	-	-	-	-	-	-	11100	35100	4-D		110		B	Sub	
CR-000X-H	Jake Alexander Blvd. E	East Rowan Connector -Long Ferry Rd (SR 2120)	Rowan County	1.6	-	-	-	-	-	-	-	4900	35100	4-D		110		B	Sub	
	Jefferson St. (SR 1915)	Whitehead Ave (SR 1915) - US 29 (Salisbury St)	Spencer	0.2	30	2	50	35	10200	3400	-	4300	10200	2-C		50		Min	Sub	
	Jefferson St. (SR 1915)	US 29 (Salisbury St) - Long St (SR 2100)	Spencer	0.3	52	4	75-190	35	22200	-	4500	4100	22200	2-C		75- 190		Min	Sub	
	Julian Rd. (SR 2528)	Jake Alexander Blvd S (US 601) - I-85	Salisbury	0.1	24	2	60-200	45	12200	15000	16900	18000	12200	2-A	4-D	60-200	110	Min	Sub	
	Julian Rd. (SR 2528)	I-85 - Old Concord Rd (SR 1002)	Salisbury	1.0	24	2	60-100	50	14600	9800	9400	13500	14600	2-A	4-D	60-100	110	Min	Sub	
	Jim Sossoman Rd (SR 1123)	NC 24/27 - US 601	Midland	2.5	24	2	60	45	12200	15000	-	1600	12200	2-A		60		Min	Sub	
CR-000X-H	Kannapolis Pkwy (SR 1430)	I-85 - NC 73 (Davidson Hwy)	Kannapolis	1.4	60	5	90	45	27600	22000	35800	33700	35100	4-B		130		B	Sub	
CR-000X-H	Kannapolis Pkwy (SR 1624)	NC 73 (Davidson Hwy) - NC 3 (Mooresville Hwy)	Kannapolis	4.2	48	4D	180-310	45	35100	16000	21000	23300	35100	4-B		180-310	130	B	Sub	
CR-000X-H	Kerr St	McGill Av - Cabarrus Ave (SR 1002)	Concord	1.0	24	2	40	35	10200	-	6600	4800	10200	2-H		75		Min	Sub	
	Kerr St	Ellis St - US 29 (Main St)	Salisbury	0.4	24	2	50	25	10000	-	4600	500	10000	2-E	2-E	50	60	Min	Sub	
	Kerr St	Lee St - Long St (SR 1002)	Salisbury	0.6	24	2	50	25	10000	-	4800	400	10000	2-E	2-E	50	60	Min	Sub	
	Kimball Rd (SR 1211)	Patterson St (SR 1223) - Grants Creek	Landis	0.7	24	2	60	45	11700	-	4200	2500	11700	2-A		60		Min	Sub	
	Kimball Rd (SR 1211)	Grants Creek - Main St (SR 2739)	Landis	0.8	24	2	60	35	10200	2800	4300	4000	10200	2-A		60		Min	Sub	
U-5608	Kimball RD Ext.	Main St (SR 2739) - US 29 (Cannon Blvd)	Landis	0.7	-	-	-	-	-	-	-	3600	10200	2-A		60		Min	Sub	
U-3459	Klumac Rd. (SR 2541)	US 29 (S Main St) - US 601 (Jake Alexander Blvd S)	Salisbury	1.0	24	2	60	35	10200	3700	4000	4200	11700	3-B		80		Min	Sub	
	Kluttz Rd (SR 2315)	Faith Town Limits - Rainey Rd (SR 2316)	Rowan County	1.1	18	2	60	45	11000	1100	2100	1200	11000	2-A		60		Min	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Lake Concord Rd	Church St (SR 2287)- Burrage Rd	Concord	0.3	50	4	60	35	22200	11000	22900	17000	22200	4-C	4-C	110	110	B	Sub	
CR-000X-H	Lake Concord Rd	Burrage Rd - NC 3 (Branchview Dr)	Concord	0.7	60	4D	50- 90	35	24300	11000	19000	14000	24300	4-C	4-C	110	110	B	Sub	
	Lane St (SR 2180)	US 29 (Cannon Blvd) - Stadium Drive	Kannapolis	2.3	50	4	60	45	24600	7000	14100	17100	35100	4-D	3-C	110	80	B	Sub	
	Lane St (SR 2180)	Stadium Drive - I-85	Kannapolis	0.4	50	4	75	45	24600	7000	14300	16700	35100	4-D	4-D	110		B	Sub	
	Lane St (SR 2180)	I-85 - Old Concord Salisbury Rd (SR 1002)	Kannapolis	0.8	22	2	50	35	10200	16000	12500	18200	31600	4-D	3-C	110	80	B	Sub	
	Lee St	Monroe St (SR 1703) - Council St	Salisbury	0.5	30	3	50	35	11700	-	-	700	11700	3-B	2-H	50	75	Min	Sub	
	Lee St	Council St - Cemetary St	Salisbury	0.3	24	2	40	35	10200	-	-	600	10200	2-H		40	75	Min	Sub	
	Legion Club Rd (SR 2314)	St Pauls Church Rd Ext - Faith Limits	Faith	0.3	18	2	60	35	9200	-	1900	800	9200	2-C	2-E	60		Min	Sub	
	Legion Club Rd (SR 2314)	Faith Limits - Granite Quarry Limits	Faith/Granite Quarry	0.1	18	2	60	45	11000	-	1900	600	11000	2-C		60		Min	Sub	
	Legion Club Rd (SR 2314)	Granite Quarry Limits - Summerleigh St	Granite Quarry	0.4	18	2	60	35	9200	2200	2800	1400	9200	2-C	2-E	60		Min	Sub	
	Lentz Rd (SR 1337)	Old Beatty Ford Rd (SR 1221) - US 29	Rowan County	4.3	20	2	60	45	11400	2200	4000	2500	11400	2-A		60		Min	Sub	
	Leonard Ave	Bethpage Rd (SR 1643) - Dale Earnhardt Blvd (SR 2126)	Kannapolis	0.2		2									2-E		60	Min	Sub	
	Liberty Rd (SR 2140)	US 52 - Hill Rd (SR 2366)	Rowan County	2.8	22	2	60	45	14100	1700	1900	2300	14100	2-A		60		Min	Sub	
	Liberty Rd (SR 2140)	Hill Rd (SR 2366) - Stokes Ferry Rd (SR 1004)	Rowan County	1.5	22	2	60	45	14100	1600	1900	2000	14100	2-A		60		Min	Sub	
CR-000X-H	Lincoln St (Rutherford St)	Chestnut Dr - Wilshire Ave (SR 1157)	Concord	1.4	24	2	60	25	10000	1900	6300	2100	10200	2-E		60		Min	Sub	
	Lincolnton Rd.	NC 150 (Mooresville Rd) - US 70 (Jake Alexander Blvd W)	Salisbury	0.3	60	5	60-100	35	24300	6400	-	4200	24300	5-A		60-100		Min	Sub	
	Lincolnton Rd.	US 70 (Jake Alexander Blvd W) - Mitchell Ave	Salisbury	0.1	60	5	60	35	22200	5200	-	5900	22200	5-A		60		Min	Sub	
	Lincolnton Rd.	Mitchell Ave - Fulton St	Salisbury	0.9	24	2	60	35	10200	5200	5000	5600	10200	2-E	2-E	60		Min	Sub	
	Lippard Rd. (SR 2530)	Glover Rd (SR 2532) - Yates Rd (SR 2531)	Rowan County	0.8	22	2	60	45	11800	700	900	800	11800	2-B		60		Min	Sub	
	Lippard Rd. (SR 2530)	Yates Rd (SR 2531) - Faith City Limits	Rowan County	0.6	16	2	40	35	9200	700	1400	800	9200	2-C		40	50	Min	Sub	
	Little Texas Rd (SR 2154)	Brantley Ave (SR 2000) - First St (SR 1706)	Kannapolis	0.9	22	2	60	35	9900	4100	10300	5400	9900	2-C	2-E	60	60	Min	Sub	
	Little Texas Rd (SR 2154)	First St (SR 1706) - NC 3 (Dale Earnhardt Blvd)	Kannapolis	1.1	22	2	60	35	9900	6900	11500	9400	9900	2-C	2-E	60	60	Min	Sub	
	Long St. (SR 1002)	Monroe St (SR 1703) - E Innes St (SR 2200)	Salisbury	0.3	60	4	80	35	22200	7800	9700	10200	24300	5-A		80		Maj	Sub	
	Long St. (SR 1002)	E Innes St (SR 2200) - Council St	Salisbury	0.1	48	4	80	35	22200	12000	8100	11900	22200	(1)	ADQ	80		Maj	Sub	
	Long St. (SR 1002)	Council St - Bringle Ferry Rd (SR 1002)	Salisbury	0.5	28	2	60	35	10200	8800	10500	7700	10200	2-E	2-E	60		Maj	Sub	
	Long St. (SR 2100)	Bringle Ferry Rd (SR 1002) - E. Spencer Town Limits	Salisbury	0.8	28	2	60	35	10200	7700	14000	6600	10200	2-E	2-E	60		Maj	Sub	
	Long St. (SR 2100)	2120)	East Spencer	2.4	28	2	60	35	10200	5000	8500	5400	10200	2-D	2-E	60		Maj	Sub	
CR-000X-H	Long Ferry Rd. (SR 2120)	Jake Alexander Blvd N - I-85	Spencer	0.8	19	2	60	45	10500	5700	6800	13600	35100	4-D		110		B	Sub	
CR-000X-H	Long Ferry Rd (SR 2120)	I-85 - Jake Alexander Blvd E	Rowan County	1.5	24	2	60	45	11700	4800	6700	6100	14600	2-A		60		Min	Sub	
	Long Ferry Rd (SR 2120)	Jake Alexander Blvd E - Goodman Lake Rd (SR 2168)	Rowan County	2.0	22	2	60	45	11300	5500	6800	6900	11300	2-A		60		Min	Sub	
CR-000X-H	Loop Rd (SR 1691)	NC 3 (Mooresville Rd) - Rowan Co	Kannapolis	0.6	60	5	70	35	24300	9500	17500	13300	28100	3-C		80		Maj	Sub	
CR-000X-H	Loop Rd (SR 1136)	Cabarrus Co - Cabarrus Co	Kannapolis	0.4	60	5	75	35	24300	8900	12800	14300	28100	3-C		80		Maj	Sub	
CR-000X-H	Loop Rd (SR 2000)	Rowan Co - Main St (SR 1008)	Kannapolis	0.1	60	5	80	35	24300	8900	12900	14300	28100	3-C		80		Maj	Sub	
	Lower Rocky River Rd (SR 1139)	Meck Co - Rocky River Rd (SR 1139)	Cabarrus County	4.8	20	2	40	45	11400	5000	7000	9700	11400	2-B		60		Min	Sub	

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CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	Lyerly St East (SR 2308)	US 52 - GQ city limits	Granite Quarry	0.4	20	2	60	35	9500	700	-	800	9500	2-C	2-E	60		Min	Sub	
	Mahaley Ave	W. Innes St (SR 2200) - Parkview Circle	Salisbury	0.3	40	2	80	35	10200	-	-	5800	10200	2-E		80		Min	Sub	
	Mahaley Ave	Parkview Circle - Mocksville Ave (SR 1910)	Salisbury	0.5	40	2	60	35	10200	-	-	5800	10200	2-E		60		Min	Sub	
	Main St. (Granite Quarry) (SR 2300)	US 52 - Bank St (SR 2314)	Granite Quarry	1.7	20	2	60	35	9500	3100	-	6600	9500	2-C	2-E	60		Min	Sub	
	Main St. (Granite Quarry) (SR 2300)	Bank St (SR 2314) - Faith Rd (SR 1006)	Granite Quarry	1.2	20	2	60	35	9500	4200	4200	8900	9500	2-C	2-E	60		Min	Sub	
CR-000X-H	Main St (SR 1008)	US 29 (Concord Pkwy) - Winecoff School Rd (SR 1790)	Concord	0.8	28	2	40- 80	35	11100	12000	14400	13600	12700	3-B		80		Maj	Sub	
CR-000X-H	Main St (SR 1008)	Winecoff School Rd (SR 1790) - Frederick Ave	Kannapolis	1.7	24	2	40	45	12200	11000	13300	11700	13300	3-C		80		Maj	Sub	
CR-000X-H	Main St (SR 1008)	Frederick Ave - Rogers Lake Rd (SR 1625)	Kannapolis	0.3	30	3	40	45	12200	10000	12700	10300	13300	3-C		80		Maj	Sub	
CR-000X-H	Main St (SR 1008)	Rogers Lake Rd (SR 1625) - NC 3 (Dale Earnhardt Blvd)	Kannapolis	1.0	30	3	40	35	11900	9400	13000	10200	11000	2-H		75		Maj	Sub	
CR-000X-H	Main St (SR 1008)	NC 3 (Dale Earnhardt Blvd) - First Street (SR 1706)	Kannapolis	0.7	30	2	60	35	10200	5900	4800	7100	11100	2-H		75		Maj	Sub	
CR-000X-H	Main St (SR 1008)	First Street (SR 1706) - Jackson Park Rd (SR 2000)	Kannapolis	0.5	30	2D	80	20	12500	5500	7400	6500	12500	2-I		85		Maj	Sub	
CR-000X-H	Main St (SR 2739)	Jackson Park Rd (SR 2000) - Kimball St	Kannapolis	0.7	24	2	60	45	12200	5900	13800	6300	12700	3-C		80		Maj	Sub	
CR-000X-H	Main St (SR 2739)	Kimball St - 22nd St (SR 1254)	Kannapolis	0.6	33	3	90	45	12800	8200	8200	9000	13300	3-C		80		Maj	Sub	
CR-000X-H	Main St (SR 2739)	22nd St (SR 1254) - Airport Rd (SR 1182)	Kannapolis	0.8	22	2	60	45	11800	7100	9000	8000	13300	3-C		80		Maj	Sub	
CR-000X-H	Main St (SR 2739)	Airport Rd (SR 1182) - NC 153 (W Rice St)	Landis	1.6	28	2	50	35	10200	7300	12600	8300	1100	3-B		80		Maj	Sub	
CR-000X-H	Main St (SR 2739)	NC 153 (W Rice St) - Central Ave	Landis	0.8	24	2	60	35	10200	7200	7300	9800	11100	3-B		80		Maj	Sub	
CR-000X-H	Main St (SR 2739)	Central Ave - Kimball Rd (SR 1211)	Landis	0.6	24	2	60	45	12200	7100	8700	7700	12200	3-B		80		Maj	Sub	
	Main St (SR 2739)	Kimball Rd (SR 1211) - NC 152 (Church St)	China Grove	1.7	33-40	2	55- 70	35	11100	6900	8600	7200	11100	3-B		55- 70	80	Maj	Sub	
	Main St (SR 1673)	NC 152 (Church St) - US 29	China Grove	0.6	33	3	85	35	10700	10000	9100	10600	10700	3-B		85		Maj	Sub	
CR-000X-H	Main St (SR 1847)	US 70 (Statesville Blvd) - Maple St (SR 1957)	Cleveland	0.7	32	3	60	35	11700	4000	5300	5400	11700	3-B		80		Min	Sub	
CR-000X-H	Main St (SR 1957)	Maple St (SR 1957) - Carr St	Cleveland	1.1	18	2	60	35	9200	16000	2000	2180	10200	2-E		60		Min	Sub	
CR-000X-H	Main St (SR 1006)	Oldenburg Dr - NC 49	Mt Pleasant	0.8	22	2	50	45	11800	8000	9400	8700	10200	2-D		90		Min	Sub	
CR-000X-H	Main St (SR 1006)	NC 49 - Fisher Rd (SR 2423)	Mt Pleasant	1.3	21	2	50	35	9700	3600	5700	6100	10200	2-D		90		Min	Sub	
	Majolica Rd. (SR 1722)	Sherrills Ford Rd (SR 1526) - US 70 (Statesville Blvd)	Salisbury	1.7	22	2	60	45	11300	1700	2500	3400	11300	2-B		60		Min	Sub	
	Martin Luther King, Jr Ave	US 601 (Jake Alexander Blvd) - Klumac Rd (SR 2541)	Salisbury	0.5	24	2	100	45	11700	-	-	5500	11700	2-B		100		Min	Sub	
	Martin Luther King, Jr Ave	Klumac Rd (SR 2541) - Vance St	Salisbury	0.3	24	2	45- 70	30	10200	-	-	5200	10200	2-E	2-E	45- 70	60	Min	Sub	
	Martin Luther King, Jr Ave	Vance St - Ryan St	Salisbury	0.2	24	2	80	35	10200	-	-	5200	10200	2-H		80		Min	Sub	
	Martin Luther King, Jr Ave	Ryan St - Old Concord Rd (SR 1002)	Salisbury	0.5	24-54	2	45-80	35	10200	-	-	5200	10200	2-E		45-80	60	Min	Sub	
	Martin Luther King, Jr Ave	Old Concord Rd (SR 1002) - E. Innes St (SR 2200)	Salisbury	0.5	50	3	80	35	11700	-	-	5400	11700	3-B		80		Min	Sub	
	Martin Luther King, Jr Ave	E. Innes St (SR 2200) - Franklin St.	Salisbury	0.3	30	2	50	25	10000	-	-	5200	10000	2-E	2-E	50	60	Min	Sub	
	Martin Luther King, Jr Ave	Franklin St. - Bringle Ferry Rd (SR 1002)	Salisbury	0.2	32	2	50	25	10000	-	-	5600	10000	2-E	2-E	50	60	Min	Sub	
CR-000X-H	Martin Luther King, Jr Ave Ext	Bringle Ferry Rd (SR 1002) - Beard St	Salisbury	0.2	-	-	-	-	-	-	-	5300	10200	2-E		50	60	Min	Sub	
CR-000X-H	Martin Luther King, Jr Ave Ext	Beard St - Pine St	Salisbury	0.2	-	-	-	-	-	-	-	5300	10200	2-E		50	60	Min	Sub	
CR-000X-H	Martin Luther King, Jr Ave	Pine St - Kenly St	Salisbury	0.2	18	2	50	35	9200	-	-	5200	10200	2-E		50	60	Min	Sub	
CR-000X-H	Martin Luther King, Jr Ave	Kenly St - Miller Ave	Salisbury	0.2	18	2	50	35	9200	-	-	5900	10200	2-E		50	60	Min	Sub	
CR-000X-H	Martin Luther King, Jr Ave	Miller Ave - Correll St	East Spencer	0.7	18	2	50	35	9200	-	-	5500	10200	2-E		50	60	Min	Sub	
CR-000X-H	Martin Luther King, Jr Ave	Correll St - Henderson St	East Spencer	0.5	18	2	50	35	9200	-	-	5700	10200	2-G		85		Min	Sub	
CR-000X-H	Martin Luther King, Jr Ave Ext	Henderson St - Long Ferry Rd (SR 2120)	East Spencer	2.0	-	-	-	-	-	-	-	5200	10200	2-G		85		Min	Sub	

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Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	McCanless Rd (SR 2186)	East Spencer City Limits - Bringle Ferry Rd (SR 1002)	Rowan County	0.8	22	2	60	45	11300	1700	5100	2200	11300	2-B		60		Min	Sub	
CR-000X-H	McGill Ave	US 29 (Cannon Blvd) - Brookwood Ext	Concord	0.4	45-60	4	60	35	18000	15000	17700	19800	11700	3-C	3-C	80	80	Maj	Sub	
CR-000X-H	McGill Ave	Brookwood Ext - Spring St	Concord	0.8	45-24	2	40- 60	35	10200	6200	8800	7000	10200	2-E	2-E	60	60	B	Sub	
CR-000X-H	Midlake Ave (SR 2198)	Brantley Rd (SR 2000) - Centergrove Rd (SR 2114)	Kannapolis	1.1	20	2	40	35	9500	3000	4500	3800	9500	2-E		60		Min	Sub	
CR-000X-H	Midland Road (SR 1121)	Bethel School Rd (SR 1120) - Bethel Church Rd (SR 1123)	Midland	0.9	18	2	40	45	11000	1800	8600	4900	12200	2-I		80-90	85	Min	Sub	
CR-000X-H	Midland Road Extension	Bethel Church Rd (SR 1123) - Old Camden Rd (SR 1132)	Cabarrus County	2.1	-	-	-	-	-	-	-	4200	12200	2-I		80-90	85	Min	Sub	
	Millbridge Rd (SR 1350)	NC 152 - NC 150 (Mooresville Rd)	Rowan County	4.4	24	2	60	45	14600	1600	2800	2100	14600	2-A		60		Min	Sub	
	Miller Rd (SR 1509)	NC 152 W (W Church St)- NC 152 Bypass	Rowan County	1.8	20	2	60	45	13600	3100	4000	1900	13600	2-A		60		Min	Sub	
	Miller Rd (SR 1509)	NC 152 Bypass -Weaver Rd (SR 1535)	Rowan County	0.4	20	2	60	45	13600	2800	3500	6200	13600	2-A		60		Min	Sub	
	Miller Rd (SR 1509)	Weaver Rd (SR 1535) -Mooresville Rd (NC 150)	Rowan County	3.1	20	2	60	45	13600	3000	4200	4500	13600	2-A		60		Min	Sub	
	Miller Chapel Rd (SR 1514)	Miller Rd (SR 1509) - Airport Rd (SR 1516)	Rowan County	2.0	20	2	60	45	11400	800	900	800	11400	2-A		60		Min	Sub	
	Mocksville Ave.	Cemetary St - Dogwood Rd	Salisbury	1.1	32	2	50	35	10200	4500	4900	4400	10200	2-E		50	60	Min	Sub	
	Monroe St. (SR 1703)	S. Long St (SR 1002) - Railroad St	Salisbury	0.1	26	2	60	35	10200	5200	5000	5900	10500	2-E		60		Min	Sub	
	Monroe St. (SR 1703)	Railroad St - US 29 (Main St)	Salisbury	0.2	20	2	40	35	9500	5200	5000	5800	9500	2-E		40	60	Min	Sub	
	Monroe St. (SR 1703)	US 29 (Main St) - Caldwell St	Salisbury	0.4	24	2	40- 45	35	10200	3000	2800	3200	10200	2-E		40- 45	60	Min	Sub	
	Monroe St. (SR 1703)	Caldwell - Partee St	Salisbury	0.5	22	2	50	35	9900	2800	3400	3200	9900	2-E		50	60	Min	Sub	
	Monroe St. (SR 1703)	Partee St - Brenner Ave.	Salisbury	0.3	25-35	2	40- 60	35	10200	-	3800	1400	10200	2-E		40- 60	60	Min	Sub	
CR-000X-H	Moose Rd (SR 1308)	Ebeneezer Rd (SR 1267) - Wright Ave	Kannapolis	1.0	20	2	60	45	10900	2200	5900	3000	10900	2-E		60		Min	Sub	
CR-000X-H	Moose Rd (SR 1308)	Wright Ave - China Grove Rd (SR 1238)	Kannapolis	1.0	16	2	60	45	10500	1000	4500	1200	10500	2-E		60		Min	Sub	
	Moose Rd (SR 1308)	China Grove Rd (SR 1238) - Turkey Rd (SR 1349)	Rowan County	0.9	20	2	60	45	10900	1000	2700	800	10900	2-A		60		Min	Sub	
	Moose Rd (SR 1308)	Turkey Rd (SR 1349) - Old Beatty Ford Rd (SR 1221)	Rowan County	1.8	20	2	60	45	10900	900	3200	500	10900	2-A		60		Min	Sub	
CR-000X-H	Morehead Rd (SR 1300)	NC 49 - Harrisburg City Limits	Harrisburg	1.0	24	2	60	45	12200	10000	16300	21100	28100	4-D		110		B	Sub	
CR-000X-H	Morehead Rd (SR 1300)	Harrisburg City Limits - Concord City Limits	Cabarrus County	0.6	36	3	90	45	13100	14000	18000	16700	16400	4-C		110		B	Sub	
CR-000X-H	Morehead Rd (SR 1300)	Concord City Limits - US 29 (Concord Pkwy)	Concord	0.9	48	4D	110	45	11800	14000	22000	14600	14800	4-C	4-C	110	110	B	Sub	
CR-000X-H	Morehead Rd (SR 1300)	US 29 (Concord Pkwy) - Mecklenburg County	Concord	0.5	21	2	40	45	11100	4500	8400	4800	28100	4-C		110		B	Sub	
	Morrison Rd (SR 1135)	Pioneer Mill Rd (SR 1134) - Flowes Store Rd (SR 1132)	Cabarrus County	0.8	24	2	60	45	11800	2600	-	6500	11800	2-A		60		Min	Sub	
	Mt. Hope Church Rd (SR 1505)	Old Concord Rd (SR 1002) - W Third St (SR 1505)	Rowan County	2.8	22	2	60	45	11800	2600	3000	3100	11800	2-A		60		Min	Sub	
	Mt Moriah Church Rd (SR 1197)	NC 153 (W Rice St) – Flat Rock Rd (SR 1121)	Rowan County	0.2	22	2	60	45	11800	3400	4700	3800	11800	2-B		60		Min	Sub	
	Mt Moriah Church Rd (SR 1197)	Flat Rock Rd (SR 1121) – Stirewalt Rd (SR 1419) Ext	Landis	1.0	22	2	60	35	9900	2300	3000	2200	9900	2-C		60		Min	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	Mt Moriah Church Rd (SR 1197)	Stirewalt Rd (SR 1419) Ext - Main St (SR 2739)	Landis	0.5	22	2	60	35	9900	2300	3200	2200	9900	2-A		60		Min	Sub	
CR-000X-H	Mt. Pleasant Bypass	NC 73 East - NC 49 East	Mt Pleasant	1.5	-	-	-	-	-	-	-	3600	36600	4-B		150	130	B	Sub	
	Mt. Pleasant Road (SR 1006)	US 601 - NC 200	Cabarrus County	3.7	18	2	50	35	9200	1600	4700	4900	9200	2-C		50		Min	Sub	
	Mt. Pleasant Road (SR 1006)	NC 200 - Cold Springs Rd (SR 2411)	Cabarrus County	4.6	20	2	50	45	11400	2200	5100	4000	11400	2-A		60		Min	Sub	
	Mt. Pleasant Road (SR 1006)	Cold Springs Rd (SR 2411) - Oldenburg Dr	Mt Pleasant	1.3	22	2	50	45	11800	4400	10300	7800	11800	2-B		50	60	Min	Sub	
CR-000X-H	Mt. Pleasant Road (SR 1006)	Fisher Rd (SR 2423) - Rowan Co	Cabarrus County	6.6	20	2	40	55	13600	3600	5200	4500	14600	2-A		60		Min	Sub	
	Neel Rd (SR 1729)	Sherrills Ford Rd (SR 1526)- NC 150 (Mooresville Rd)	Rowan County	2.3	20	2	60	45	11400	900	1200	1100	11400	2-A		60		Min	Sub	
CR-000X-H	Newsome Rd Extension	Bendix Dr - US 52 (Innes Street)	Salisbury	1.0	-	-	-	-	-	-	-	1000	11700	3-B		80		Min	Sub	
CR-000X-H	Newsome Rd.	US 52 (Innes Street) - Stokes Ferry Rd (SR 1004)	Salisbury	<.1	39	2	50	35	10200	-	4500	4800	11700	3-B		80		Min	Sub	
CR-000X-H	Newsome Rd.	Stokes Ferry Rd (SR 1004) - Bringle Ferry Rd (SR 1002)	Salisbury	1.0	18	2	40	35	10500	3700	4500	3500	11700	2-E		80	50	Min	Sub	
CR-000X-H	Northern Connector	Jim Sossoman Rd (SR 1123) - US 601	Cabarrus County	1.0	-	-	-	-	-	-	-	5900	12200	2-I		85		B	Sub	
CR-000X-H	Northern Connector	US 601 - Widenhouse Rd	Cabarrus County	0.7	-	-	-	-	-	-	-	1300	12200	2-I		85		B	Sub	
CR-000X-H	Northern Connector	Widenhouse Rd - NC 24/27	Cabarrus County	1.1	-	-	-	-	-	-	-	1300	12200	2-I		85		B	Sub	
CR-000X-H	Oakwood Ave (SR 1745)	Orphanage Rd (SR 1778) - Rogers Lake Rd (SR 1625)	Kannapolis	2.2	18	2	30	45	11000	3900	6400	4400	11700	2-E		60		Min	Sub	
CR-000X-H	Oakwood Ave Extension (SR 1745)	Rogers Lake Rd (SR 1625) - Bethpage Rd (SR 1643)	Kannapolis	0.9	-	-	-	-	-	2700	3900	1600	11700	2-E		60		Min	Sub	
CR-000X-H	Odell School Rd (SR 1442)	Poplar Tent Rd (SR 1394) - NC 73 (Davidson Hwy)	Cabarrus County	1.5	22	2	40	45	11800	7700	12500	16400	36600	4-C		110		B	Sub	
CR-000X-H	Odell School Rd (SR 1442)	NC 73 (Davidson Hwy) - Windy Rd (SR 1442)	Cabarrus County	1.5	22	2	40	45	11800	9700	12700	22800	36600	4-C		110		B	Sub	
CR-000X-H	Odell School Rd (SR 1601)	Windy Rd (SR 1442) - NC 3 (Mooresville	Cabarrus County	2.6	20	2	40	45	11400	8000	15500	18100	36600	4-C		110		B	Sub	
CR-000X-H	Old Airport Rd (SR 2635)	NC 3 (Branchview Dr)- Crestmont Dr (SR 2641)	Concord	0.9	20	2	60	45	11400	4600	10200	6500	13200	3-C	3-C	80		Min	Sub	
CR-000X-H	Old Airport Rd (SR 2635)	Crestmont Dr (SR 2641) - NC 49	Concord	2.4	18	2	40	45	11000	2000	7700	2400	13200	3-C	3-C	80		Min	Sub	
CR-000X-H	Old Beatty Ford Rd (SR 1210)	US 29 - Bostian Rd (SR 1221)	Rowan County	0.9	18	2	60	45	10500	1500	2600	2700	12200	2-A		60		Maj	Sub	
	Old Beatty Ford Rd (SR 1221)	Bostian Rd (SR 1221) - Ebeneezer Rd (SR 1322)	Rowan County	0.4	18	2	60	55	11600	1700	3200	3500	12200	2-A	2-A	60		Min	Sub	
	Old Beatty Ford Rd (SR 1221)	Ebeneezer Rd (SR 1322) - I-85	Rowan County	0.8	22	2	60	55	14100	1500	2600	3200	14600	2-A	2-A	60		Min	Sub	
	Old Beatty Ford Rd (SR 1221)	I-85 - Lentz Rd (SR 1337)	Rowan County	1.8	22	2	60	55	14100	1300	3700	2700	14600	2-A	2-A	60		Min	Sub	
CR-000X-H	Old Beatty Ford Rd (SR 1221)	Lentz Rd (SR 1337) - Old Concord Road (SR 1002)	Rowan County	0.7	24	2	60	45	14600	2900	5700	3100	14600	2-A		60		Maj	Sub	
CR-000X-H	Old Beatty Ford Rd (SR 1221)	Old Concord Rd (SR 1002) - Organ Church Rd (SR 1006)	Rowan County	4.8	20	2	60	45	13600	3400	5100	4300	14600	2-A		60		Maj	Sub	
CR-000X-H	Old Beatty Ford Rd (SR 1221)	Organ Church Rd (SR 1006) - Lower Stone Ch Rd (SR 2335)	Rowan County	1.9	20	2	60	55	14100	2000	5100	3100	14600	2-A		60		Maj	Sub	
CR-000X-H	Old Beatty Ford Rd (SR 1221)	Lower Stone Church Rd (SR 2335) - Emmanual Church Rd (SR 2338)	Rowan County	2.1	20	2	60	55	14100	1400	3500	2000	14600	2-A		60		Maj	Sub	
CR-000X-H	Old Beatty Ford Rd (SR 1221)	Emanuel Church Rd (SR 2338) - St. Stephens Church Rd (SR 2352)	Rowan County	2.4	20	2	60	55	14100	1500	3000	2600	14600	2-A		60		Maj	Sub	
CR-000X-H	Old Beatty Ford Rd (SR 1221)	St. Stephens Church Rd (SR 2352) - Old US 80 (SR 2350)	Rowan County	1.2	20	2	60	55	14100	1200	3000	2200	14600	2-A		60		Maj	Sub	
CR-000X-H	Old Beatty Ford Rd (SR 1221)	Old US 80 (SR 2350) - US 52	Rowan County	0.4	20	2	60	55	14100	1300	3300	2500	14600	2-A		60		Maj	Sub	
	Old Beatty Ford Rd (SR 2356)	US 52 - Stokes Ferry Rd (SR 1004)	Rowan County	4.1	18	2	60	45	13100	700	1500	400	13100	2-A		60		Min	Sub	
CR-000X-H	Old Beatty Ford Rd Relocation	Bostian Rd (SR 1221) -China Grove Rd (SR 1238)	Rowan County	0.5	-	-	-	-	-	-	-	10400	12200	2-C	4-C	60	110	Maj	Sub	
CR-000X-H	Old Beatty Ford Rd Relocation	China Grove Rd (SR 1238) - I-85	Rowan County	0.4	-	-	-	-	-	-	-	13000	14600	2-C	4-C	60	110	Maj	Sub	

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CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Old Beatty Ford Rd Relocation	I-85 - Lentz Rd (SR 1337)	Rowan County	1.4	-	-	-	-	-	-	-	5600	14600	2-C	4-C	60	110	Maj	Sub	
	Old Camden Rd (SR 1132)	Mecklenburg Co - NC 24/27	Cabarrus County	1.5	22	2	60	45	11400	5600	-	1800	11700	2-A		60		Min	Sub	
CR-000X-H	Old Charlotte Rd (SR 1157)	NC 49 - Roberta Rd (SR 1304)	Concord	1.7	20	2	60	35	9500	10000	16400	16900	28100	4-C		110		B	Sub	
CR-000X-H	Old Charlotte Rd (SR 1335)	Roberta Rd (SR 1304) - US 601	Concord	0.3	20	2	60	35	9500	8800	11800	16200	28100	4-C		110		B	Sub	
CR-000X-H	Old Charlotte Rd	US 601 - Cabarrus Ave (SR 1002)	Concord	1.1	22	2	40	35	9900	5600	9700	6700	11700	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Old Concord Rd (SR 1002)	Lane St (SR 2180) - Rowan Co	Cabarrus County	0.7	22	2	40	55	14100	8900	11900	12300	36600	4-E	4-B	110	130	B	Sub	
CR-000X-H	Old Concord Rd (SR 1002)	Cabarrus Co - Old Beatty Ford Rd (SR 1221)	Rowan County	1.5	19	2	60	55	13350	6500	8200	9100	36600	4-E		110		B	Sub	
CR-000X-H	Old Concord Rd (SR 1002)	Old Beatty Ford Rd (SR 1221) - E NC 152	Rowan County	2.9	19	2	60	45	11200	4000	5300	5500	36600	4-E		110		B	Sub	
CR-000X-H	Old Concord Rd (SR 1002)	E NC 152 - St. Pauls Church Rd (SR 2529)	Rowan County	3.9	22	2	60	45	11800	5000	6900	6700	36600	4-E		110		B	Sub	
CR-000X-H	Old Concord Rd (SR 1002)	St. Pauls Church Rd (SR (2529) - Julian Rd (SR 2528)	Rowan County	1.5	24	2	60	55	14600	6300	8600	10200	36600	4-E		110		B	Sub	
CR-000X-H	Old Concord Rd (SR 1002)	Julian Rd (SR 2528) - Jake Alexander Blvd S (SR 1007)	Salisbury	2.3	24	2	60	55	14600	6500	8100	10100	35100	4-G		110		B	Sub	
CR-000X-H	Old Concord Rd (SR 1002)	St	Salisbury	0.9	18	2	60	45	13100	9400	10200	13700	35100	4-G		110		B	Sub	
	Old Concord Rd (SR 1002)	Harrell St - Monroe St (SR 1703)	Salisbury	0.5	50	4	80	35	22200	8300	7900	10400	22200	(1)	ADQ	80		Maj	Sub	
	Old Mocksville Rd (SR 1910)	Dogwood Rd - Ridge Rd (SR 1915)	Salisbury	2.4	18	2	50	45	11000	1800	2000	1300	11000	2-B		50		Min	Sub	
	Old Mocksville Rd (SR 1910)	Ridge Rd (SR 1915) - US 601	Rowan County	4.2	18	2	60	45	11000	1900	1000	1600	11000	2-A		60		Min	Sub	
	Old NC 80 (SR 2350)	St. Stephens Church Rd (SR 2352) - Doby Dr (SR 2351)	Rowan County	0.1	18	2	60	35	9200	900	1200	1200	9200	2-A		60		Min	Sub	
CR-000X-H	Old Salisbury Rd (SR 1002)	NC 3 - Concord City Limits	Concord	1.3	24	2	60	35	10200	7000	111000	11800	28100	4-B		130		B	Sub	
CR-000X-H	Old Salisbury Rd (SR 1002)	Concord City Limits - Penninger Rd (SR 2113)	Cabarrus County	1.4	22	2	50	45	11800	5500	5500	8500	16000	4-B		130		B	Sub	
CR-000X-H	Old Salisbury Rd (SR 1002)	Penninger Rd (SR 2113) - Lane St (SR 2180)	Cabarrus County	3.5	22	2	50	45	14100	3500	5200	4000	16000	4-B		130		B	Sub	
	Old Stonehouse Rd. (SR 2308)	Lyerly St (SR 2308) - Dunns Mtn Church Rd (SR 2126)	Granite Quarry	0.8	20	2	60	45	11400	700	-	500	11400	2-A	2-E	60		Min	Sub	
	Old Union Church Rd (SR 1915)	I-85 - Goodman Lake Rd (SR 2168)	Rowan County	2.9	20	2	60	45	13600	1100	1600	300	13600	2-A		60		Min	Sub	
	Old US 70 (SR 1957)	Carr St - NC 801	Rowan County	3.1	16	2	60	45	10500	1100	1500	1400	10500	2-A		60		Min	Sub	
	Old US 70 (SR 1957)	NC 801 - US 70 (Statesville Blvd)	Rowan County	0.5	16	2	60	45	10500	700	1600	1100	10500	2-A		60		Min	Sub	
CR-000X-H	Organ Church Rd (SR 1006)	Cabarrus Co - Old Beatty Ford Rd (SR 1221)	Rowan County	2.3	18	2	60	55	13600	1600	2500	1900	14600	2-A		60		Min	Sub	
CR-000X-H	Organ Church Rd (SR 1006)	Old Beatty Ford Rd (SR 1221) - NC 152	Rowan County	1.8	18	2	60	55	13600	3000	3300	2500	14600	2-A		60		Min	Sub	
CR-000X-H	Orphanage Rd (SR 1778)	Trinity Church Rd (SR 1622) - Oakwood Ave (SR 1745)	Kannapolis	1.3	20	2	45	45	9500	7000	11000	8500	9500	3-C		80		Min	Sub	
CR-000X-H	Orphanage Rd (SR 1778)	Oakwood Ave (SR 1745) - Winecoff School Rd (SR 1790)	Kannapolis	0.6	20	2	45	45	9500	4600	8600	5800	9500	3-C		80		Min	Sub	
	Park Ave	Long St (SR 1002) - Arlington St	Salisbury	0.4	30	2	60	25	10000	-	-	600	10000	2-D	ADQ	60		Min	Sub	
	Patterson Rd (SR 1533)	Millbridge Rd (SR 1350) - Weaver Rd (SR 1535)	Rowan County	2.8	16	2	60	45	13100	700	700	600	13100	2-A		60		Min	Sub	
	Patterson Rd (SR 1533)	Weaver Rd (SR 1535) - NC 150	Rowan County	2.5	16	2	60	45	13100	800	900	800	13100	2-A		60		Min	Sub	
	Patterson St (SR 1225)	W NC 152 - Grants Creek	China Grove	1.6	20	2	60	45	11400	2300	3500	1800	11400	2-B		60		Min	Sub	
	Patterson St (SR 1225)	Grants Creek - S Main St (SR 2739)	China Grove	0.6	28	2	50	35	10200	2100	2800	1200	10200	2-D		50	90	Min	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	Peach Orchard Rd (SR 2539)	Airport Rd Ext - I-85	Rowan County			2	60	45	11400	-	4600	3500	11400	2-A		60		Min	Sub	
	Peach Orchard Rd (SR 2539)	I-85 - Old Concord Rd (SR 1002)	Rowan County	1.0	20	2	60	45	11400	-	4600	3500	11400	2-A		60		Min	Sub	
	Peeler Rd (SR 2538)	US 29 (S Main St) - Town Creek	Rowan County	0.6	20	2	-	55	13600	-	-	15400	14600	2-A		60		Min	Sub	
	Peeler Rd (SR 2538)	Town Creek - I-85	Rowan County	0.4	48	2	130	45	12200	4500	6500	15200	12200	2-A		130		Min	Sub	
	Peeler Rd (SR 2538)	I-85 - Old Concord Rd (SR 1002)	Rowan County	1.3	24	2	60	45	14600	4900	5300	6200	14600	2-A		60		Min	Sub	
	Peeler St (SR 2313)	Faith Rd (SR 1006)- Granite Quarry Limits	Rowan County	0.4	20	2	60	45	13600	3400	8400	7200	13600	2-B		60		Min	Sub	
	Peeler St (SR 2313)	Granite Quarry Limits - Main St (SR 2300)	Granite Quarry	0.8	24	2	60	35	10200	3500	9000	7400	10200	2-D	3-B	60	90	Min	Sub	
CR-000X-H	Penninger Rd (SR 2113)	Old Salisbury Rd (SR 1002) - Mullis Rd (SR 2284)	Cabarrus County	1.7	18	2	50	45	9200	700	1200	2200	9200	3-B	3-C	80		Min	Sub	
	Penninger Rd (SR 2113)	Mullis Rd (SR 2284) - Centergrove Rd (SR 2114)	Cabarrus County	0.3	18	2	50	45	9200	700	1200	2200	9200	2-A	3-C	50	80	Min	Sub	
	Penninger Rd (SR 2113)	Centergrove Rd (SR 2114) - Old Salisbury Rd (SR 1002)	Cabarrus County	0.9	18	2	50	45	9200	700	1200	2200	9200	2-A	2-B	50	60	Min	Sub	
CR-000X-H	Pharr Mill Rd (SR 1158)	Rocky River Rd (SR 1139) - Tom Query Rd Extension	Harrisburg	1.1	20	2	40	45	11400	2500	7000	6900	13200	3-B	3-C	80		Min	Sub	
CR-000X-H	Pharr Mill Rd (SR 1158)	Tom Query Rd Extension- Shamrock Rd (SR 1160)	Harrisburg	0.9	24	2	50	45	11400	2400	3900	5600	35100	4-D		110		B	Sub	
CR-000X-H	Pharr Mill Rd (SR 1158)	Shamrock Rd (SR 1160) - Mulberry Rd (SR 1159)	Harrisburg	0.5	24	2	50	45	12200	1700	4200	5300	35100	4-D		110		B	Sub	
CR-000X-H	Pharr Mill Rd (SR 1158)	Mulberry Rd (SR 1159) - NC 49	Harrisburg	0.3	24	2	-	45	12200	2800	4200	8700	35100	4-D		110		B	Sub	
	Pioneer Mill Rd (SR 1134)	NC 24/27 - Morrison Rd (SR 1135)	Cabarrus County	1.5	24	2	60	45	12200	-	-	400	12200	2-A		60		Min	Sub	
CR-000X-H	Pitts School Rd Ext	Blackwelder Rd (SR 1307) - Roberta Rd (SR 1304)	Harrisburg	1.2	-	-	-	-	-	-	10600	5500	36600	4-D		110		B	Sub	
	Pitts School Rd (SR 1305)	Roberta Rd (SR 1304) - US 29	Concord	3.1	20	2	40	45	11400	6900		15400	36600	4-C	4-C	110	110	B	Sub	
	Pitts School Rd (SR 1305)	US 29 - Weddington Rd (SR 1431)	Concord	1.5	35	3	65	45	12300	12000		14200	36600	4-C	4-C	110	110	B	Sub	
CR-000X-H	Pitts School Rd (SR 1305)	Weddington Rd (SR 1431) - Poplar Tent Rd (SR 1394)	Concord	1.4	22	2	65	45	11800	7600	1200	19000	36600	4-C	4-C	110	110	B	Sub	
		US29-Wedd									114200									
CR-000X-H	Plaza Rd Ext (SR 1171)	Mecklenburg Co - Mecklenburg Co	Harrisburg	0.5	22	2	50	35	9900	3300	-	5700	15900	3-B	3-C	80	80	Min	Sub	
CR-000X-H	Plaza Rd Ext (SR 1176)	Mecklenburg Co - Rocky River Rd (SR 1139)	Harrisburg	0.4	18	2	30	45	12200	3300	-	7900	14200	3-B	3-C	80	80	Min	Sub	
CR-000X-H	Plaza Rd Ext	Rocky River Rd (SR 1139) - Tom Query Rd (SR 1166)	Harrisburg	1.2	-	-	-	-	-	-	-	7000	28100	3-B	3-C	80	80	Min	Sub	
CR-000X-H	Plum Rd (SR 1615)	Unity Church Rd (SR 1355) - Tuckaseegee Rd (SR 1616)	Cabarrus County	1.2	18	2	40	55	13600	1400	5000	1000	14600	2-A		60		Min	Sub	
CR-000X-H	Poplar Tent Rd (SR 1394)	NC 73 (Davidson Hwy) - Derita Rd (SR 1445)	Concord	4.2	22	2	50	45	11800	14000	20800	33000	36600	4-C		110		B	Sub	
	Poplar Tent Rd (SR 1394)	Derita Rd (SR 1445) - I-85	Concord	0.9	24	2	110-140	45	12200	21000	59100	35400	36600	4-C		110		B	Sub	
	Poplar Tent Rd (SR 1394)	I-85 - Woodhaven Place	Concord	0.6	24	2	110-140	45	11700	16000	2400	31100	35100	4-C		110		B	Sub	
CR-000X-H	Poplar Tent Rd (SR 1394)	Woodhaven Place - George Liles Pkwy (SR 1430)	Concord	1.5	24	2	110-140	45	11700	16000	2400	31100	35100	4-C		110		B	Sub	
CR-000X-H	Poplar Tent Rd (SR 1394)	George Liles Pkwy (SR 1430) - US 29 (Concord Pkwy)	Concord	3.1	22	2	60	45	11300	16000	2100	37600	35100	4-C		110		B	Sub	
CR-000X-H	Powder St	Cabarrus Ave (SR 1002) - Corban Ave	Concord	0.1	24	2	45	35	10200	-	-	600	22200	2-H	3-C	80	80	Min	Sub	
	Providence Church Rd (SR 2134)	Stokes Ferry Rd (SR 1004) - Bringle Ferry Rd (SR 1002)	Rowan County	1.7	20	2	60	45	13600	1400	1800	1000	13600	2-A		60		Min	Sub	
	Providence Church Rd (SR 2134)	Bringle Ferry Rd (SR 1002) - Goodman Lake Rd (SR 2168)	Rowan County	1.7	20	2	60	45	13600	1300	1500	1400	13600	2-A		60		Min	Sub	
CR-000X-H	Rainbow Dr (SR 1643)	Main St (SR 1008) - NC 3 (Mooresville Rd)	Kannapolis	1.0	21	2	60	35	9700	3800	5300	4000	10200	2-E		60		Min	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Rainbow Dr (SR 1371)	NC 3 (Mooresville Rd) - West C St (SR 1124)	Kannapolis	2.0	20	2	60	45	10900	1900	2200	1800	11700	2-E		60		Min	Sub	
	Rainey Rd (SR 2316)	Faith Rd (SR 1006) - Stone Rd (SR 2315)	Rowan County	1.9	20	2	60	45	11400	1100	1200	1300	11400	2-A		60		Min	Sub	
	Richfield Rd (SR 1005)	Stanly Co - Stokes Ferry Rd (SR 1004)	Rowan County	1.0	16	2	60	45	13100	700	-	800	13100	2-A		60		Min	Sub	
	Richfield Rd (SR 1005)	Stokes Ferry Rd (SR 1004) - Reeves Island Rd (SR 2148)	Rowan County	0.9	16	2	60	45	13100	500	400	700	13100	2-A		60		Min	Sub	
	Richfield Rd (SR 1005)	Reeves Island Rd (SR 2148) - Bringle Ferry Rd (SR 1002)	Rowan County	4.4	18	2	60	45	13100	300	700	400	13100	2-A		60		Min	Sub	
~~CR-000X-H~~	~~Ridge Ave (SR 2001)~~	~~US 29 (Concord Pkwy) - I-85~~	~~Concord~~	~~0.5~~	~~20~~	~~2~~	~~40-95~~	~~35~~	~~9500~~	~~2000~~	~~9200~~	~~4600~~	~~10200~~	~~2-E~~		~~60~~		~~Min~~	~~Sub~~	
CR-000X-H	Ridge Ave	I-85 - NC 3 (Dale Earnhart Blvd)	Kannapolis	3.0	20	2	35	35	9500	3700	20500	11000	10200	2-E		60		Min	Sub	
CR-000X-H	Ridge Ave	NC 3 (Dale Earnhart Blvd) - Rowan Co	Kannapolis	1.2	20	2	48	35	9500	4000	9700	4400	10200	2-E		60		Min	Sub	
CR-000X-H	Ridge Ave	Cabarrus Co - Ebenezer Rd (SR 1267)	Kannapolis	0.9	22	2	50	35	9900	3700	11800	3400	10200	2-E		60		Min	Sub	
CR-000X-H	Ridge Ave	Ebenezer Rd (SR 1267) - US 29 (Cannon Blvd)	Kannapolis	0.4	20	2	40	35	9500	2400	-	2600	10200	2-E		60		Min	Sub	
	Ridge Rd (SR 1944)	Woodleaf Rd (SR 2048) - US 601 (W Innes St)	Salisbury	1.8	22	2	60	45	11800	2100	2600	3400	11800	2-B		60		Min	Sub	
	Ridge Rd (SR 1915)	US 601 (W Innes St) - Douglass St (SR 2069)	Salisbury	0.5	24	2	60	45	12200	3300	5300	3700	12200	2-B		60		Min	Sub	
	E Ridge Rd (SR 1915)	Douglass St (SR 2069) - Old Mocksville Rd (SR 1910)	Rowan County	1.7	20	2	60	45	13600	3100	5000	3700	13600	2-A		60		Min	Sub	
	E Ridge Rd (SR 1915)	Old Mocksville Rd (SR 1910) - Hollywood Dr (SR 1915)	Rowan County	1.2	22	2	60	45	14100	2600	5200	3300	14100	2-A		60		Min	Sub	
CR-000X-H	Roberta Rd Ext	Tom Query Rd Ext - Stallings Rd (SR 1161)	Harrisburg	0.3	-	-	-	-	-	-	-	17400	28100	4-D		110		B	Sub	
CR-000X-H	Roberta Rd Ext	Stallings Rd (SR 1161) - NC 49	Harrisburg	0.5	-	-	-	-	-	-	-	19200	28100	4-D		110		B	Sub	
CR-000X-H	Roberta Rd (SR 1304)	NC 49 - Carl Parmer Dr	Harrisburg	0.5	36	3	90	35	11700	13000	12800	21300	28100	4-D		110		B	Sub	
CR-000X-H	Roberta Rd (SR 1304)	Carl Parmer Dr - Pitts School Rd (SR 1305)	Harrisburg	1.1	24	2	100	35	10200	6400	20900	15500	35100	4-D		110		B	Sub	
CR-000X-H	Roberta Rd (SR 1304)	Pitts School Rd (SR 1305) - George Liles Pkwy (SR 1310)	Concord	1.7	20	2	50	45	10900	7400	13400	19200	35100	4-C	4-C	110	110	B	Sub	
CR-000X-H	Roberta Rd (SR 1304)	George Liles Pkwy (SR 1310) - Old Charlotte Rd (SR 1335)	Concord	3.3	21	2	60	35	9700	4900	8500	7400	28100	4-C	4-C	110	110	B	Sub	
CR-000X-H	Robinson Church Rd (SR 1168)	Mecklenburg Co - Tom Query Rd (SR 1166)	Harrisburg	1.6	22	2	40- 60	45	11300	7000	10700	12100	36600	4-D		110		B	Sub	
CR-000X-H	Robinson Church Rd (SR 1166)	Tom Query (SR 1166) – Stallings Rd (SR 1161)	Harrisburg	0.4	20	2	40- 85	45	11400	9600	14600	10000	11700	3-B		80		Min	Sub	
CR-000X-H	Rock Hill Church Rd (SR 1414)	US 29 (Cannon Blvd) - Weddington Rd (SR 1431)	Concord	0.8	24	2	60	45	12200	12000	19100	10900	12700	4-C		110		B	Sub	
CR-000X-H	Rock Hill Church Rd (SR 1414)	Weddington Rd (SR 1431) - Poplar Tent Rd (SR 1394)	Concord	1.2	22	2	60	35	9900	3500	6600	6600	12700	3-C	3-C	80		Min	Sub	
CR-000X-H	Rocky River Rd (SR 1139)	Mecklenburg Co - Robinson Church Rd (SR 1168)	Cabarrus County	1.5	20	2	60	45	11400	9200	16300	15300	43600	4-C		110		B	Sub	
CR-000X-H	Rocky River Rd (SR 1139)	Robinson Church Rd (SR 1168) - Hickory Ridge Rd (SR 1138)	Cabarrus County	1.4	16	2	60	45	11000	6500	12000	14700	43600	4-C		110		B	Sub	
CR-000X-H	Rocky River Rd (SR 1139)	Hickory Ridge Rd (SR 1138) - Pharr Mill Rd (SR 1158)	Concord	1.7	20	2	60	45	11400	7200	14300	14900	43600	4-C		110		B	Sub	
CR-000X-H	Rocky River Rd (SR 1139)	Pharr Mill Rd (SR 1158) - NC 49	Concord	5.7	20	2	60	45	11400	6500	13100	17000	43600	4-C		110		B	Sub	
CR-000X-H	Rogers Lake Rd (SR 1625)	Kannapolis Pkwy (SR 1624) - Irish Buffalo Creek	Kannapolis	0.9	60-72	4D	100-115	45	35100	6800	9000	11800	35100	4-C		110		B	Sub	
CR-000X-H	Rogers Lake Rd (SR 1625)	Irish Buffalo Creek - Main St (SR 1008)	Kannapolis	1.8	16	2	40	35	9200	6500	8400	14000	15900	4-C	3-C	110	80	B	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Rogers Lake Rd (SR 1766)	Main Street (SR 1008) - NC 3 (Dale Earnhardt Blvd)	Kannapolis	0.7	18	2	30	35	9200	5100	8700	7900	14600	3-C		80		Min	Sub	
	Roseman Rd (SR 1500)	Grace Church Rd (SR 1503) - Southern Lane	Rowan County	0.6	20	2	60	45	11400	3600	4500	3900	11400	2-A		60		Min	Sub	
	Roseman Rd (SR 1500)	Southern Lane - US 29 (S Main St)	Rowan County	0.5	20	2	60	35	9500	3600	4900	4300	9500	2-A		60		Min	Sub	
	Rowan Mill Road (SR 1526)	NC 150 (Mooresville Rd) - Airport Pkwy	Salisbury	0.7	20	2	50-60	45	10900	3400	3900	6400	10900	2-B		50-60		Min	Sub	
	Rowan Mill Road (SR 1526)	Airport Pkwy - Foxfire Dr	Salisbury	0.6	22	2	50	35	9900	3800	4900	2900	9900	2-C	2-B	50	60	Min	Sub	
	Rowan Mill Road (SR 1526)	Foxfire Dr - US 29 (S Main St)	Salisbury	0.5	22	2	44-50	35	9900	3800	4500	1500	9900	2-C	2-B	44-50	60	Min	Sub	
	Ruth Ave	Jackson St - N. Little Texas Rd	Kannapolis			2									2-E		60	Min	Sub	
	Ryder Ave (SR 1210)	Mt Moriah Church Rd (SR 1197) - Main St (SR 2739)	Landis	0.7	30	2	50	35	10200	3700	5300	3900	10200	2-E		50	60	Min	Sub	
	Ryder Ave (SR 1210)	Main St (SR 2739) - US 29 (Cannon Blvd)	Landis	0.7	30	2	50	35	11100	4000	5800	5300	11100	2-C		50		Maj	Sub	
	Safrit Rd (SR 2547)	Cruse Rd (SR 2551) - Webb Rd (SR 1500)	Rowan County	1.3	16	2	60	45	11000	-	800	400	11000	2-A		60		Min	Sub	
	St. Lukes Church Rd. (SR 2380)	US 52 - Miracle Dr (SR 2457)	Granite Quarry	1.1	24	2	60	35	10200	2300	-	2300	11700	3-A	ADQ	60		Min	Sub	
	St. Lukes Church Rd (SR 2380)	Miracle Dr (SR 2457) - US 52 Bypass	Rowan County	0.5	22	2	60	45	11800	1100	-	2200	11800	2-A		60		Min	Sub	
	St. Matthews Church Rd (SR 2140)	Stokes Ferry Rd (SR 1004) - Bringle Ferry Rd (SR 1002)	Rowan County	3.2	20	2	60	45	13600	1500	1700	3200	13600	2-A		60		Min	Sub	
	St. Paul's Church Rd (SR 2529)	Old Concord Rd (SR 1002) - Faith Rd (SR 1006)	Rowan County	2.0	24	2	60	45	14600	3400	5300	6400	14600	2-A		60		Min	Sub	
CR-000X-H	St. Paul's Church Rd Ext	Faith Rd (SR 1006) - Kluttz Rd (SR 2315)	Faith	1.3	-	-	-	-	-	-	-	4300	14600	2-A		60		Min	Sub	
	St. Stephens Church Rd (SR 2444)	NC 49 - Rowan Co	Cabarrus County	5.6	20	2	40	45	13600	700	1600	900	13600	2-B		40	60	Min	Sub	
	St. Stephens Church Rd (SR 2352)	Cabarrus Co - Old Beatty Ford Rd (SR 1221)	Rowan County	0.5	24	2	60	35	10200	700	1200	900	10200	2-A	2-B	60	60	Min	Sub	
	St. Stephens Church Rd (SR 2352)	Old Beatty Ford Rd (SR 1221) - Old NC 80 (SR 2350)	Rowan County	0.9	18	2	40	25	9000	800	1300	1200	9000	2-A	2-B	40	60	Min	Sub	
	Sells Rd. (SR 1911)	W. Innes Street (SR 2200) - Windsor Dr	Salisbury	0.2	20	2	35	35	9500	3200	-	4400	9500	2-C		35	50	Min	Sub	
	Sells Rd. (SR 1911)	Windsor Dr - E. Ridge Rd (SR 1915)	Salisbury	1.8	18	2	30	50	11000	1200	-	2500	11000	2-A		30	60	Min	Sub	
	Seventeenth St	Rowan Ave - Seventh St	Spencer	0.8	18	2	50	25	9000	-	-	600	9000	2-C		50	60	Min	Sub	
	Seventh St. (SR 1914)	Old Mocksville Rd (SR 1910) - Spencer Town Limits	Salisbury	1.5	20	2	60	45	11400	900	1000	700	11400	2-B		60		Min	Sub	
	Seventh St (SR 1912)	Spencer Town Limits - US 29 (Salisbury Ave)	Spencer	0.9	18	2	60	35	9200	700	900	400	9200	2-C		60		Min	Sub	
	Sherrills Ford Rd (SR 1526)	NC 801 - Barringer Rd (SR 1728)	Rowan County	3.7	20	2	60	45	11400	4300	7100	6200	11400	2-A		60		Min	Sub	
	Sherrills Ford Rd (SR 1526)	Barringer Rd (SR 1728) - Majolica Rd (SR 1722)	Rowan County	2.7	22	2	100	45	11800	5100	6500	6300	11800	2-A		100		Min	Sub	
	Sherrills Ford Rd (SR 1526)	Majolica Rd (SR 1722) - NC 150 (Mooresville Rd)	Salisbury	1.1	24	2	60	45	11700	9700	9700	12200	14600	2-A		60		Min	Sub	
CR-000X-H	Shiloh Church Rd (SR 1600)	NC 73 - Odell School Rd (SR 1601)	Kannapolis	2.4	18	2	40	45	11000	-	-	3500	12200	2-E		60		Min	Sub	
	Shue Rd (SR 1506)	N Main St (SR 1673) - Grants Creek	China Grove	1.2	20	2	60	35	9200	2300	3200	2700	9200	2-C		60		Min	Sub	
	Shue Rd (SR 1506)	Grants Creek - NC 152 Bypass	Rowan County	0.8	20	2	60	45	9500	-	3000	2600	9500	2-A		60		Min	Sub	
	Shue Rd (SR 1506)	NC 152 Bypass - Grace Church Rd (SR 1503)	Rowan County	1.1	20	2	60	45	9500	1900	2900	1800	9500	2-A		60		Min	Sub	
	Sims Pkwy	NC 49 - Forest St	Harrisburg	0.2	18	2	30	25	9000	-	-	500	9000	2-D		30	90	Min	Sub	

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CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
	Smith Rd (SR 1360)	Wright Rd (SR 1363) - Enochville School Rd (SR 1360)	Rowan County	1.3	16	2	60	45	13100	1700	1600	2600	13100	2-A		60		Min	Sub	
CR-000X-H	Stallings Rd (SR 1161)	Robinson Church Rd (SR 1166) - Tom Query Rd Ext	Harrisburg	1.2	20	2	50	35	9500	6100	17300	10300	14600	3-B	3-C	80		Min	Sub	
CR-000X-H	Stallings Rd (SR 1161)	Tom Query Rd Ext - Rocky River Rd (SR 1139)	Harrisburg	1.9	20	2	50	35	9500	6100	15300	16600	14600	3-B	3-C	80		Min	Sub	
CR-000X-H	Statesville Blvd (SR 2094)	US 601 (Jake Alexander Blvd) - Innes St (SR 2200)	Salisbury	1.8	48	4	80	45	24600	14000	16400	13900	17500	3-B	ADQ	80		Maj	Sub	
CR-000X-H	Stirewalt Rd Ext	Mt Moriah Church Rd (SR 1197) - Kimball Rd (SR 1211)	Landis	0.4	-	-	-	-	-	-	-	1400	11700	2-H		75		Min	Sub	
CR-000X-H	Stirewalt Rd Ext	Kimball Rd (SR 1211) - Patterson St (SR 1225)	Rowan County	1.5	-	-	-	-	-	-	-	1500	12200	2-A		60		Min	Sub	
CR-000X-H	Stirewalt Rd (SR 1419)	Patterson St (SR 1225) - NC 152 (Church St)	Rowan County	0.3	20	2	60	55	11400	1000	1500	1900	12200	2-A		60		Min	Sub	
	Stokes Ferry Rd (SR 1004)	US 52 (Innes St) - Sills Dr	Salisbury	1.3	22	2	60	45	11300	4900	10200	4200	11300	2-D		60	90	Min	Sub	
	Stokes Ferry Rd (SR 1004)	Sills Dr - Dunns Mountain Church Rd (SR 2126)	Salisbury	0.4	22	2	60	50	14100	7800	8000	4900	14100	2-D		60	90	Min	Sub	
	Stokes Ferry Rd (SR 1004)	Dunns Mountain Church Rd (SR 2126) - Dunns Mountain Rd (SR 2131)	Salisbury	0.6	24	2	60	50	14600	7500	7800	4300	14600	2-A		60		Min	Sub	
	Stokes Ferry Rd (SR 1004)	Dunns Mountain Rd (SR 2131) - Providence Church Rd (SR 2134)	Rowan County	3.4	24	2	60	50	14600	5300	5300	4100	14600	2-A		60		Min	Sub	
	Stokes Ferry Rd (SR 1004)	Providence Church Rd (SR 2134) - High Rock Road (SR 2143)	Rowan County	6.0	24	2	60	50	15100	2900	3900	2900	15100	2-A		60		Min	Sub	
	Stokes Ferry Rd (SR 1004)	High Rock Road (SR 2143) - Stanly Co	Rowan County	6.2	24	2	60	50	15100	1000	1700	1000	15100	2-A		60		Min	Sub	
	Stone Rd (SR 2315)	Raney Rd (SR 2315) - US 52	Granite Quarry	1.2	18	2	60	45	11000	1300	2600	2700	11000	2-B	ADQ	60		Min	Sub	
	Third Street (SR 2037)	US 29 (Salisbury Ave) - Whitehead Ave (SR 2037)	Spencer	0.5	24	2	60	35	10200	1400	3000	2200	10200	2-E		60		Min	Sub	
	Third Street (SR 1915)	Whitehead Ave (SR 2037) - Lincoln Ave (SR 1916)	Spencer	0.5	30	2	60	35	10200	2200	4600	2800	10200	2-E		60		Min	Sub	
CR-000X-H	Third Creek Church Rd (SR 1973)	US 70 (Statesville Blvd) - Baker Mill Rd (SR 1957)	Rowan County	3.0	18	2	60	55	13100	900	-	1100	14600	2-A		60		Min	Sub	
CR-000X-H	Third Creek Church Rd (SR 1957)	Baker Mill Rd (SR 1957) - Hill N Dale Ln	Rowan County	1.4	20	2	60	55	13600	1700	-	2100	14600	2-A		60		Min	Sub	
CR-000X-H	Third Creek Church Rd (SR 1957)	Hill N Dale Ln - Main St (SR 1957)	Cleveland	0.2	18	2	60	35	9200	400	-	500	10200	2-A		60		Min	Sub	
CR-000X-H	Tom Query Rd (SR 1166)	Mecklenburg Co - Plaza Rd Extension	Harrisburg	0.4	18	2	45	45	11000	-	-	5200	14200	3-B	3-C	80		Min	Sub	
CR-000X-H	Tom Query Rd (SR 1166)	Plaza Rd Extension - Caldwell Rd (SR 1173)	Harrisburg	0.1	20	2	50	45	11400	-	-	5100	14200	3-B	3-C	80		Min	Sub	
CR-000X-H	Tom Query Rd (SR 1166)	Caldwell Rd (SR 1173) - Robinson Church Rd (SR 1166)	Harrisburg	1.0	20	2	40- 50	45	11400	4500	8500	4900	35100	4-D	3-C	110	80	B	Sub	
CR-000X-H	Tom Query Rd Ext	Robinson Church Rd (SR 1166) - Pharr Mill Rd (SR 1158)	Harrisburg	2.6	-	-	-	-	-	-	-	5300	36600	4-D	3-C	110	80	B	Sub	
CR-000X-H	Trexler Rd (SR 2378)	Barger Rd (SR 2377) - Stokes Ferry Rd (SR 1004)	Rowan County	1.1	16	2	60	55	13100	800	1000	700	14600	2-A		60		Min	Sub	
CR-000X-H	Trinity Church Rd (SR 1622)	NC 73 (Davidson Hwy) - Orphanage Rd (SR 1778)	Kannapolis	0.5	22	2	50-175	35	9900	8100	17800	21700	26800	4-D	3-C	110	80	B	Sub	
CR-000X-H	Trinity Church Rd (SR 1622)	Orphanage Rd (SR 1778) - Kannapolis Parkway (SR 1624)	Kannapolis	0.9	22	2	40-128	35	9900	7800	12800	27600	26800	4-D	3-C	110	80	B	Sub	
CR-000X-H	Trinity Church Rd (SR 1623)	Kannapolis Parkway(SR 1624) - Drakestone Rd (SR 1922)	Kannapolis	2.6	24	2	40-140	45	14600	2100	5800	2839	16000	3-B	3-C	80	80	Min	Sub	
CR-000X-H	Trinity Church Rd (SR 1623)	Drakestone Rd (SR 1922) - NC 3 (Mooresville Hwy)	Kannapolis	1.3	20	2	40-140	45	13600	800	2100	800	16000	3-B	3-C	80		Min	Sub	
	Troutman Rd (SR 1145)	Jim Sossoman Rd (SR 1123) to Cal Bost Rd (SR 1143)	Cabarrus County	2.7	24	2	60	45	11400	-	-	1600	11400	2-A		60		Min	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Tuckaseegee Rd (SR 1616)	NC 3 (Mooresville Hwy) - Westside Bypass	Cabarrus County	0.6	16	2	40- 60	45	11000	3000	4400	4600	13200	3-B		80		Min	Sub	
CR-000X-H	Tuckaseegee Rd (SR 1351)	Westside Bypass - S Enochville Ave (SR 1351)	Rowan County	0.4	20	2	60	55	13600	4200	1900	4700	13200	3-A		80		Min	Sub	
	Turkey Rd (SR 1349)	Lane St (SR 2180) - Rowan Co	Cabarrus County	0.5	16	2	50	45	11000	-	-	200	11000	2-B		50	60	Min	Sub	
	Turkey Rd (SR 1349)	Cabarrus Co - Moose Rd (SR 1308)	Rowan County	0.4	20	2	60	45	11400	-	-	200	11400	2-A		60		Min	Sub	
	Twenty-second St-Jack Rd (SR 1163)	W A St (SR 1100) - Main St (SR 2739)	Kannapolis	1.0	18	2	30	35	9200	1900	2600	2500	9200	2-C	2-E	30	60	Min	Sub	
	Twenty-second St (SR 1254)	US 29 (Cannon Blvd) - Ebenezer Rd (SR 1322)	Kannapolis	0.6	20	2	40	35	9500	700	300	900	9500	2-E	2-E	40	60	Min	Sub	
	Union St	NC 3 (Branchview Rd) - Manor Ave	Concord	0.7	24	2	60	35	10200	6600	14500	12900	10200	2-C	3-C	80	80	B	Sub	
	Union St	Manor Ave - Corban Ave	Concord	1.7	35	2	40- 60	35	10200	7300	11200	7500	10200	2-E	2-E	40- 60	60	B	Sub	
CR-000X-H	Union Cemetary Rd	Old Charlotte Rd (SR 1335) -Sunderland Rd	Concord	0.6	22	2	50	35	9900	7600	11500	8500	24300	4-D	4-C	110	110	B	Sub	
CR-000X-H	Union Cemetary Rd Relocation	Sunderland Rd - US 29 (Cannon Blvd)	Concord	0.7	-	-	-	-	-	-	-	8300	24300	4-D	4-C	110	110	B	Sub	
CR-000X-H	Unity Church Rd (SR 1355)	Plum Rd (SR 1615) - Deal Rd (SR 1353)	Rowan County	2.6	18	2	40- 60	45	13100	1300	4100	900	14600	2-A		60		Min	Sub	
CR-000X-H	Unity Church Rd (SR 1355)	Deal Rd (SR 1353) - W NC 152	Rowan County	2.5	16	2	60	55	13600	400	580	400	14600	2-A		60		Min	Sub	
CR-000X-H	Upper Palmer Rd (SR 2341)	NC 152 Ext - US 52 Bypass	Rockwell	0.5	24	2	60	45	12200	2100		2400	12200	2-A		60		Min	Sub	
CR-000X-H	Upper Palmer Rd (SR 2341)	US 52 Bypass - Lower Palmer Rd (SR 2343)	Rowan County	0.2	18	2	60	45	11000	2100	3000	4700	12200	2-A		60		Min	Sub	
CR-000X-H	Upper Palmer Rd (SR 2341)	Lower Palmer Rd (SR 2343) - Gold Knob Rd (SR 2375)	Rowan County	0.6	16	2	60	55	13600	700	1000	300	12200	2-A		60		Min	Sub	
	Weaver Rd (SR 1535)	Millbridge Rd (SR 1350) - Patterson Rd (SR 1533)	Rowan County	1.5	16	2	60	45	11400	-	-	1900	12200	2-A		60		Min	Sub	
	Weaver Rd (SR 1535)	Patterson Rd (SR 1533) - Miller Rd (SR 1509)	Rowan County	2.3	16	2	60	45	11400	-	-	1100	12200	2-A		60		Min	Sub	
	Webb Rd (SR 1500)	US 29 (S Main St) - I-85	Rowan County	0.7	24	2	60	45	12200	4000	5500	5700	12200	2-A		60		Min	Sub	
	Webb Rd (SR 1500)	I-85 - Old Concord Rd (SR 1002)	Rowan County	2.0	24	2	60	45	12200	2800	4500	3800	12200	2-A		60		Min	Sub	
CR-000X-H	Weddington Rd (SR 1431)	Old Holland Rd (SR 1520) - Bruton Smith Blvd (SR 2894)	Concord	0.4	24	2	60	35	11400	-	-	13900	35100	4-C		110		B	Sub	
CR-000X-H	Weddington Rd (SR 1431)	Bruton Smith Blvd (SR 2894) - Reuben Linker Rd (SR 1438)	Concord	1.2	70	4D	100	45	35100	-	-	25900	35100	4-C		110		B	Sub	
CR-000X-H	Weddington Rd (SR 1431)	Reuben Linker Rd (SR 1438) - Pitts School Rd (SR 1305)	Concord	0.6	45	3	70-100	45	12800	-	-	27000	35100	4-C		110		B	Sub	
CR-000X-H	Weddington Rd (SR 1431)	Pitts School Rd (SR 1305) - George Liles Blvd (SR 1430)	Concord	3.0	20	2	40	45	11400	9200	12800	19900	35100	4-C		110		B	Sub	
CR-000X-H	Weddington Rd (SR 1431)	George Liles Blvd (SR 1430) - Rock Hill Ch Rd (SR 1414)	Concord	1.9	20	2	40	45	11400	12000	16700	14000	35100	4-C		110		B	Sub	
CR-000X-H	Weddington Rd Ext	Rock Hill Church Rd (SR 1414) - US 29 (Cannon Blvd)	Concord	1.0	-	-	-	-	-	-	-	10300	35100	5-A	4-C	100	110	B	Sub	
CR-000X-H	West A St (SR 1100)	Loop Rd (SR 1136) - Enochville Rd (SR 1104)	Kannapolis	0.9	18	2	40	35	9200	4500	5500	5400	11700	3-C		80		Min	Sub	
CR-000X-H	West A St (SR 1100)	Enochville Rd (SR 1104) - Klutz Drive	Kannapolis	0.2	18	2	40	35	9200	2500	4200	3100	11700	3-C		80		Min	Sub	
CR-000X-H	West A St (SR 1100)	Klutz Drive - Airport Rd (SR 1182)	Kannapolis	1.0	18	2	60	45	10500	1800	3100	2100	11700	3-C		80		Min	Sub	
CR-000X-H	West A St (SR 1100)	Airport Rd (SR 1182) - Main St (SR 2739)	Kannapolis	0.7	18	2	60	35	9200	1600	2600	1300	11700	3-C		80		Min	Sub	
CR-000X-H	West C St (SR 1124)	Enochville Ave (SR 1351) - Cabarrus Co	Rowan County	1.9	24	2	60	45	12200	6700	8000	7900	13200	3-C		80		Min	Sub	
CR-000X-H	West C St (SR 1680)	Rowan Co - Loop Rd (SR 1691)	Kannapolis	0.7	30	2	30	35	10200	8100	8700	9500	11700	3-C		80		Min	Sub	
CR-000X-H	Westside Bypass	NC 3 (Mooresville Hwy) - Tuckaseegee Rd (SR 1616)	Cabarrus County	1.1	-	-	-	-	-	-	-	28100	45200	4-A		180		B	Sub	
CR-000X-H	Westside Bypass	Tuckaseegee Rd (SR 1616) - Rowan Co	Cabarrus County	0.1	-	-	-	-	-	-	-	10800	45200	4-A		180		B	Sub	
CR-000X-H	Westside Bypass	Cabarrus Co - Wright Rd Relocation	Rowan County	0.7	-	-	-	-	-	-	-	6500	45200	4-A		180		B	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

CTP INVENTORY AND RECOMMENDATIONS

HIGHWAY																					
					2013 Existing System						2040 Proposed System										
Local ID	Facility	Section (From - To)	Jurisdiction	Dist. (mi)	Cross-Section (ft)	Cross-Section lanes	ROW (ft)	Speed Limit (mph)	Existing Capacity (vpd)	2013 AADT	2040 AADT E+C	2040 AADT with MTP	Proposed Capacity (vpd)	Cross-Section	Revised Cross-Section	ROW (ft)	ROW (ft)	CTP Classification	Tier	Other Modes
CR-000X-H	Westside Bypass	Wright Rd Relocation - Enochville School Rd (SR 1360)	Rowan County	1.3	-	-	-	-	-	-	-	7400	45200	4-A		180		B	Sub	
CR-000X-H	Westside Bypass	Enochville School Rd (SR 1360) - N Enochville Ave (SR 1351)	Rowan County	0.6	-	-	-	-	-	-	-	8900	45200	4-A		180		B	Sub	
CR-000X-H	Westside Bypass	N Enochville Ave (SR 1351) - Saw Rd (SR 1350)	Rowan County	1.3	-	-	-	-	-	-	-	9900	45200	4-A		180		B	Sub	
CR-000X-H	Westside Bypass (Saw Rd)	Saw Rd (SR 1350) - W NC 152	Rowan County	0.9	20	2	60	55	14100	2900	3600	6300	45200	4-A		180		B	Sub	
	Widenhouse Rd	NC 24/27 - Northern Connector	Midland	0.8	18	2	60	25	10000	-	-	300	13600	2-A		60		Min	Sub	
	White Rd (SR 1737)	NC 150 (Mooresville Rd) - Sherrills Ford Rd (SR 1526)	Rowan County	3.2	20	2	60	45	13600	1400	2600	2300	13600	2-A		60		Min	Sub	
	Whitehead Ave (SR 2037)	Seventh St (SR 1912) - Third St (SR 1915)	Spencer	1.0	18	2	50	35	9200	-	-	4400	9200	2-C		50		Min	Sub	
	Whitehead Ave (SR 1915)	Third St (SR 2037) - Jefferson St (SR 1915)	Spencer	1.0	32	2	60	35	9200	3500	-	4400	9200	2-E		60		Min	Sub	
CR-000X-H	Wilshire Ave (SR 1157)	Old Charlotte Rd (SR 1157) - US 601 (Warren C Coleman Blvd)	Concord	0.9	18	2	40	35	9200	6700	13100	8900	28100	4-C		110		B	Sub	
CR-000X-H	Wilshire Ave (SR 1157)	US 601 (Warren C Coleman Blvd) - Union St	Concord	1.3	20	2	40	35	9500	6800	11100	1100	28100	4-C		110		B	Sub	
CR-000X-H	Wilshire Ave Ext	Union St - NC 3 (Branchview Dr)	Concord	0.7	-	-	-	-	-	-	-	1200	28100	4-C		110		B	Sub	
CR-000X-H	Windy Rd (SR 1442)	Odell School Rd (SR 1601) - NC 3 (Mooresville Hwy)	Cabarrus County	1.4	20	2	40	45	13600	3500	15500	7400	15100	2-A	4-C	60	110	Min	Sub	
CR-000X-H	Winecoff School Rd (SR 1790)	NC 73 (Davidson Hwy) - I-85	Concord	0.6	24	2	40- 60	35	10200	9100	11400	12900	10200	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Winecoff School Rd (SR 1790)	I-85 - Linker Av	Kannapolis	0.4	23	2	60	35	10050	6900	7300	9100	11700	3-B	3-C	80	80	Min	Sub	
CR-000X-H	Winecoff School Rd (SR 1790)	Linker Ave - Main St (SR 1008)	Concord	0.4	23	2	40	35	10050	6700	10800	6800	11700	3-C	3-C	80	80	Min	Sub	
	Woodleaf Rd (SR 2048)	US 601 (Jake Alexander Blvd) - W Ridge Rd (SR 1944)	Salisbury	1.3	28	2	60	35	10200	7700	6100	8600	10200	2-A		60		Min	Sub	
	Woodleaf Rd (SR 2048)	W Ridge Rd (SR 1944) - Goodson Rd (SR 1954)	Rowan County	2.8	22	2	60	45	12200	4700	6500	5900	12200	2-A		60		Min	Sub	
CR-000X-H	Woodleaf Rd (SR 2048)	Goodson Rd (SR 1954) - NC 801	Rowan County	2.8	22	2	60	55	14100	3500	2800	4500	14600	2-A		60		Min	Sub	
	Wright Rd (SR 1359)	Deal Rd (SR 1353) - Karriker Rd (SR 1359)	Rowan County	1.0	20	2	60	45	13600	1000	3800	800	13600	2-A		60		Min	Sub	
	Wright Rd (SR 1363)	Karriker Rd (SR 1359) - Russel Farm Rd	Rowan County	2.8	20	2	60	35	9500	2400	3800	2700	9500	2-A		60		Min	Sub	
CR-000X-H	Wright Rd Relocation	Russel Farm Rd - Westside Bypass	Rowan County	0.4	-	-	-	-	-	-	-	2700	13100	3-A		80		Min	Sub	
CR-000X-H	Wright Rd Relocation	Westside Bypass - Enochville Ave (SR 1351)	Rowan County	0.4	-	-	-	-	-	-	-	1600	13100	3-A		80		Min	Sub	
CR-000X-H	Zion Church Rd (SR 1152)	Flowes Store Rd (SR 1132) - Archibald Rd (SR 1153)	Concord	1.8	20	2	40	55	13600	1400	5700	3000	13100	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Zion Church Rd (SR 1153)	Archibald Rd (SR 1153) - Zion Church Rd E (SR 1153)	Concord	1.4	18	2	60	55	13100	5600	13400	10600	13100	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Zion Church Rd (SR 1155)	Zion Church Rd E (SR 1153) - NC 49	Concord	0.8	24	2	60	55	14600	5400	9900	8400	13100	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Zion Church Rd (SR 1155)	NC 49 - Webb Rd (SR 1155)	Concord	0.9	24	2	60	45	11700	4400	6400	6000	13100	3-C	3-C	80	80	Maj	Sub	
CR-000X-H	Zion Church Rd (SR 1482)	Webb Rd (SR 1155) - US 601 (Warren C Coleman Blvd)	Concord	0.2	24	2	60	45	11700	2800	3500	4000	13100	3-C	3-C	80	80	Maj	Sub	
CR-000X-H	Zion Church Rd (SR 1157)	US 601 (Warren C Coleman Blvd) - Wilshire Ave (SR 1157)	Concord	0.1	24	2	60	35	10200	1200	2000	2000	13100	3-C	3-C	80	80	Min	Sub	
CR-000X-H	Zion Church Rd East (SR 1153)	Zion Church Rd (SR 1155) - US 601	Concord	1.6	18	2	60	45	11000	4900	15100	11800	13100	3-C	3-C	80	80	Min	Sub	

(1) Existing Four-lane undivided urban section with curb and gutter

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT MCCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

May 5, 2014

MEMO TO: Jon Nance, PE, Deputy Chief Engineer
Kevin Lacy, PE, State Traffic Engineer
Ricky Greene, Jr., PE, Director of Field Support
Mike Bruff, PE, Manager, Transportation Planning Branch
Roadway Design Unit Regional Managers
Richard Hancock, PE, Manager, Project Development & Environmental Analysis

FROM: Debbie Barbour, PE
Director of Preconstruction

SUBJECT: "Typical" Highway Cross Sections

The comprehensive planning and design "typical" highway cross sections have been updated in response to the Strategic Transportation Investments Law (House Bill 817) and are also consistent with SPOTOnline (used for Project Prioritization), NCDOT's GIS-based Web Application for providing automated, near real-time prioritization scores and project costs. This guidance establishes design elements that emphasize safety, mobility, complete streets, and accessibility for multiple modes of travel. These "typical" highway cross sections should be used as guidelines for comprehensive transportation planning, project planning and project design activities. The specific and final cross section details and right of way limits for projects will be established through the preparation of the National Environmental Policy Act (NEPA) documentation and through final design preparation.

Please provide this information to your Unit staff, Division staff, and to others as appropriate for their information and immediate implementation. This guidance is intended for State Transportation Improvement Program (STIP) projects and other applicable projects. If you have any questions, please contact one of the Roadway Design Unit Regional Managers, Glenn Mumford, PE, Roger Thomas, PE, or Doug Taylor, PE at 919-707-6200.

DMB/mb

Attachments

cc w/attachments: Mike Holder, PE
Susan Pullium
Rodger Rochelle, PE
Calvin Leggett, PE
Terry Gibson, PE

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
DIRECTOR OF PRECONSTRUCTION
1538 MAIL SERVICE CENTER
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LOCATION:
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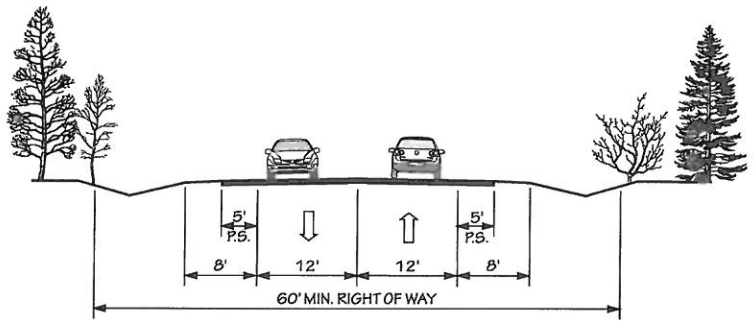
1 SOUTH WILMINGTON STREET
RALEIGH NC

Division Engineers
Don Voelker
Tom Childrey
Debbie Collins
Lauren Blackburn
Ron Hancock, PE
Division Design Engineers

"TYPICAL" HIGHWAY CROSS SECTIONS

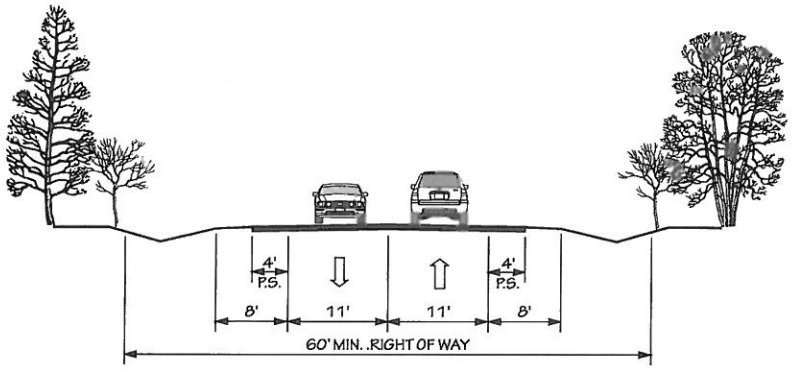
2A



2 LANE UNDIVIDED WITH PAVED SHOULDERS

POSTED SPEED 55 MPH

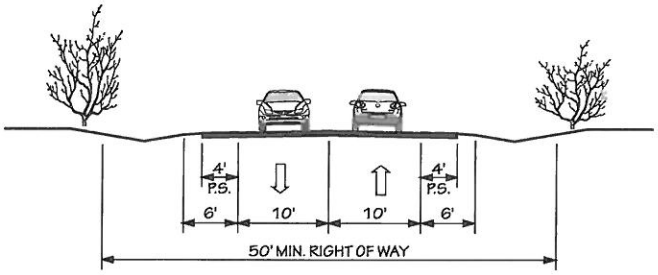
2B



2 LANES UNDIVIDED

POSTED SPEED 45 MPH OR LESS

2C

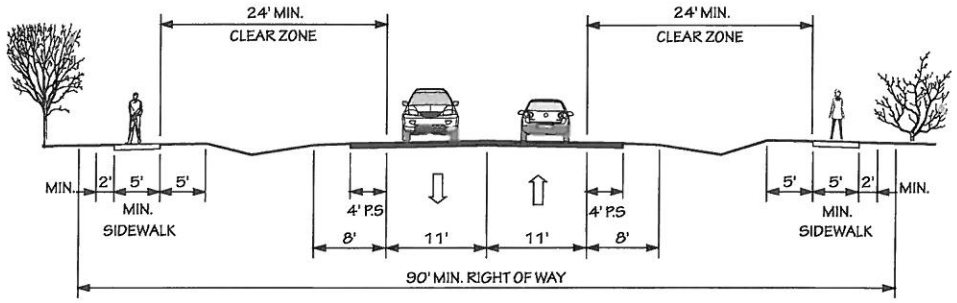


2 LANE UNDIVIDED WITH PAVED SHOULDERS

POSTED SPEED 25 - 35 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS

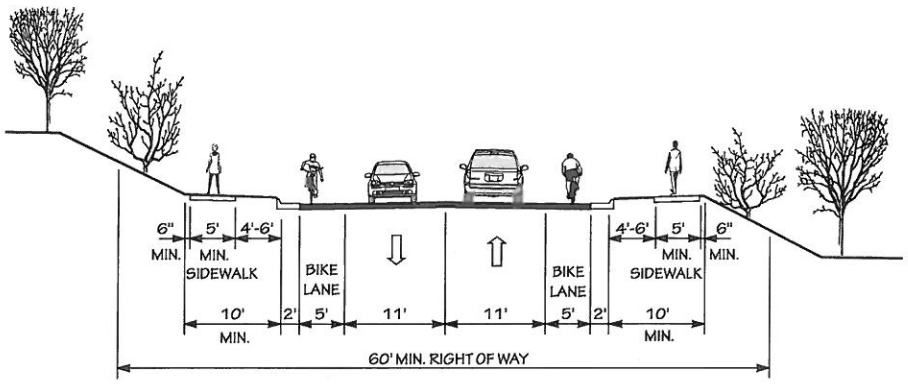
2D



2 LANE UNDIVIDED WITH PAVED SHOULDERS AND SIDEWALKS

POSTED SPEED 25-45 MPH

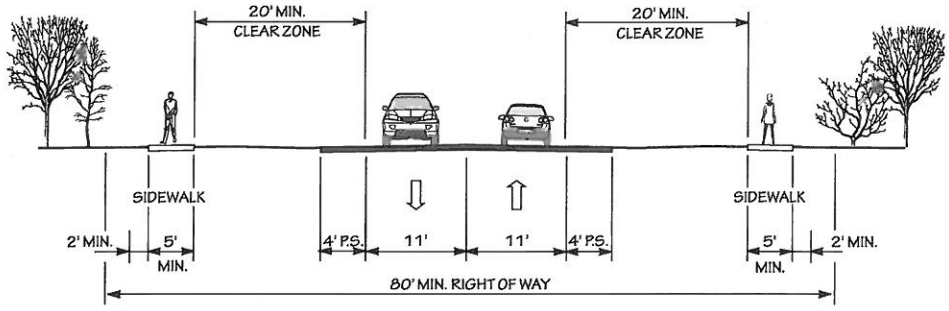
2E



2 LANE UNDIVIDED WITH CURB & GUTTER, BIKE LANES, AND SIDEWALKS

POSTED SPEED 25-45 MPH

2F

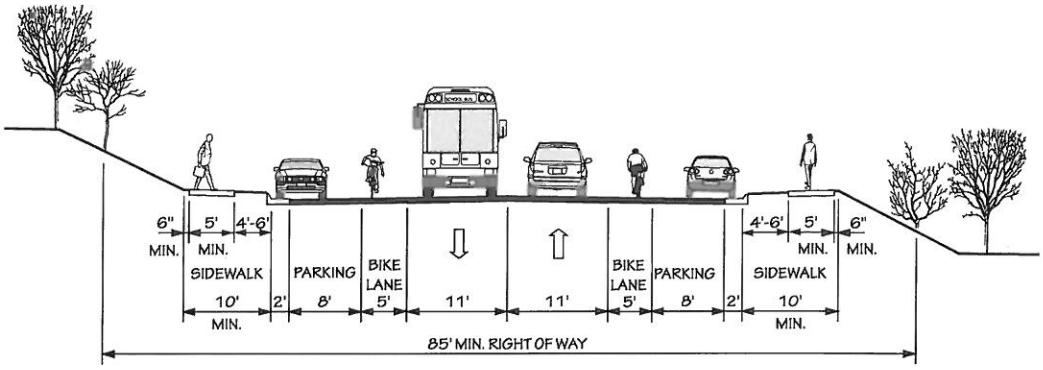


2 LANE UNDIVIDED WITH PAVED SHOULDERS AND SIDEWALKS
IN CAMA COUNTIES

POSTED SPEED 25-45 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS

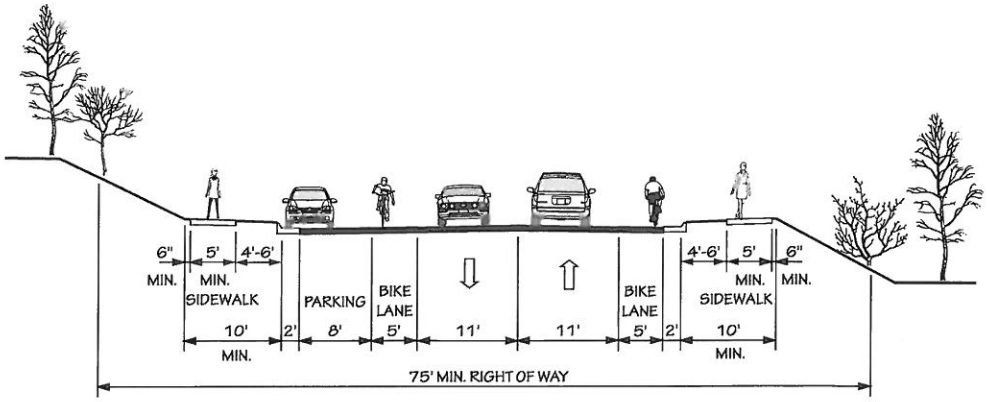
2G



2 LANE UNDIVIDED WITH CURB & GUTTER, PARKING BOTH SIDES, BIKE LANES, AND SIDEWALKS

POSTED SPEED 25-45 MPH

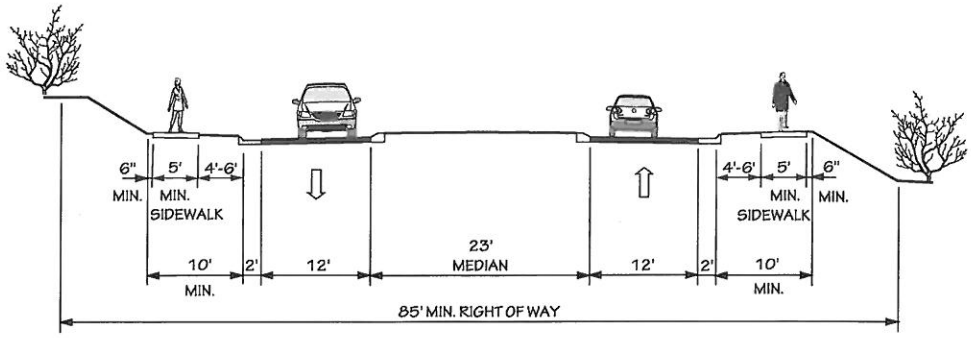
2H



2 LANE UNDIVIDED WITH CURB & GUTTER, PARKING ONE SIDE, BIKE LANES, AND SIDEWALKS

POSTED SPEED 25-45 MPH

2I

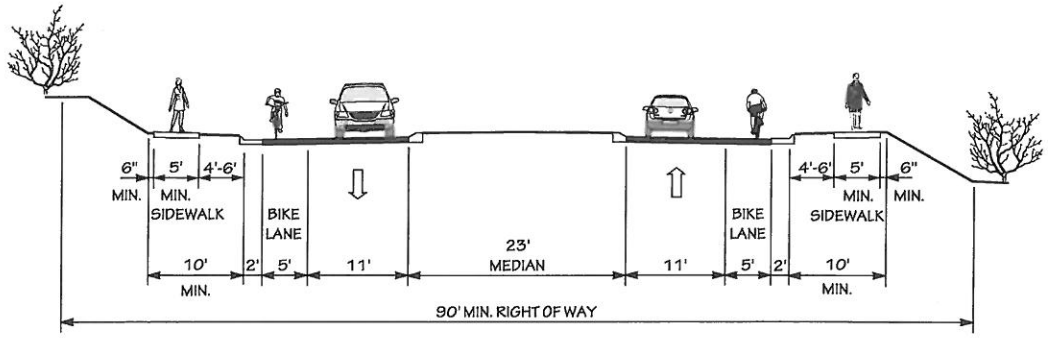


2 LANE DIVIDED (23' RAISED MEDIAN) WITH CURB & GUTTER AND SIDEWALKS

POSTED SPEED 25-45 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS

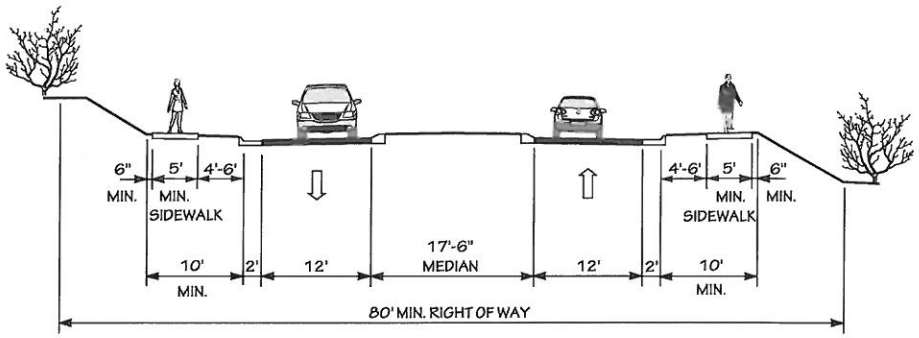
2J



2 LANE DIVIDED (23' RAISED MEDIAN) WITH CURB & GUTTER, BIKE LANES, AND SIDEWALKS

POSTED SPEED 25-45 MPH

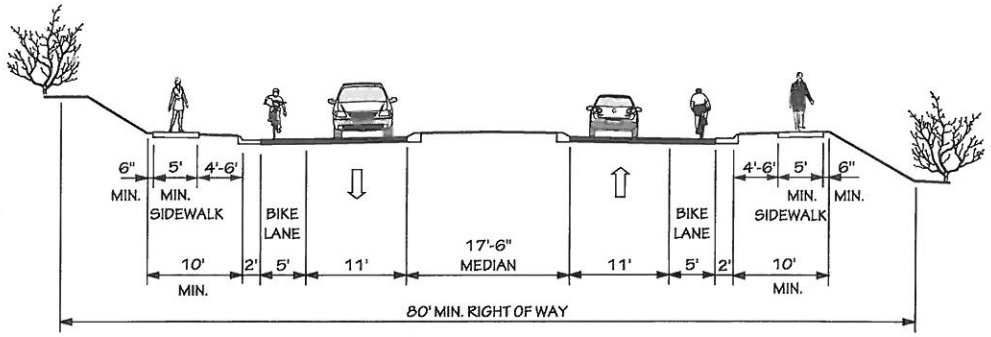
2K



2 LANE DIVIDED (17'-6" RAISED MEDIAN) WITH CURB & GUTTER AND SIDEWALKS

POSTED SPEED 25-45 MPH

2L

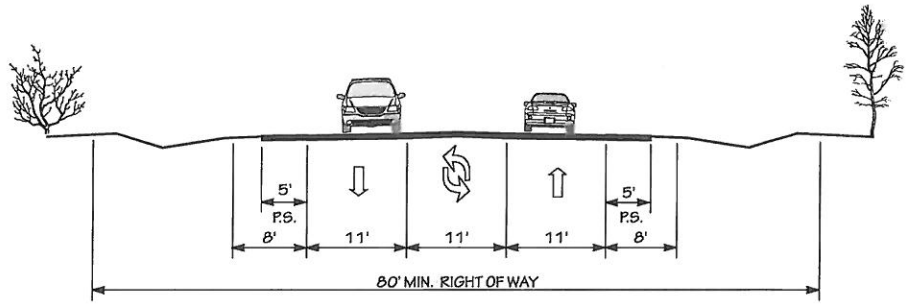


2 LANE DIVIDED (17'-6" RAISED MEDIAN) WITH CURB & GUTTER, BIKE LANES, AND SIDEWALKS

POSTED SPEED 25-45 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS

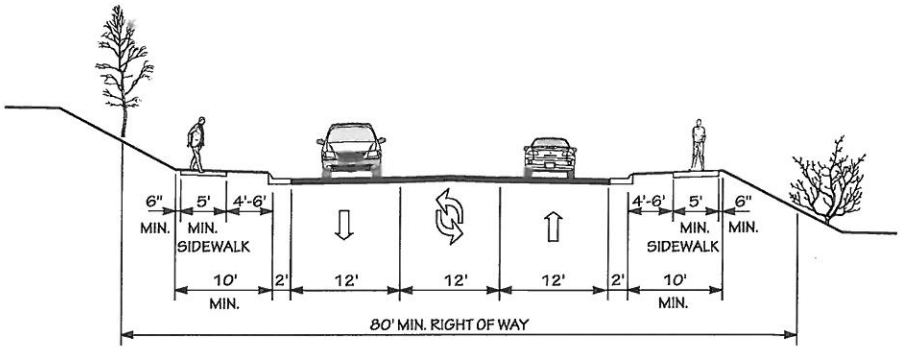
3A



2 LANE WITH TWO WAY LEFT TURN LANE, AND PAVED SHOULDERS

POSTED SPEED 25-55 MPH

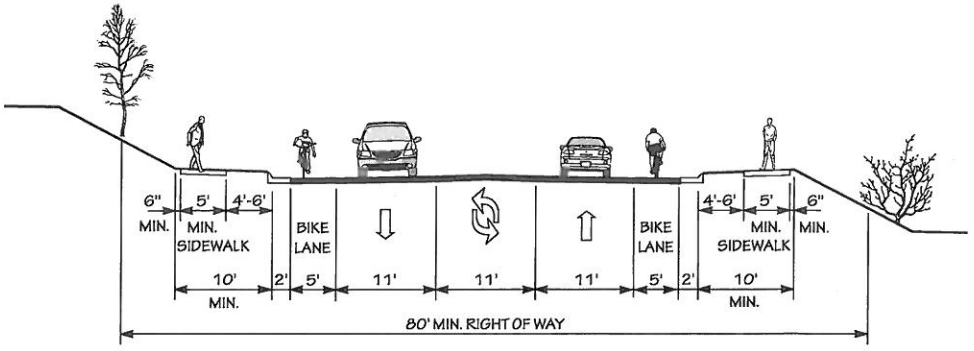
3B



2 LANE WITH TWO WAY LEFT TURN LANE, CURB & GUTTER, AND SIDEWALKS

POSTED SPEED 25-45 MPH

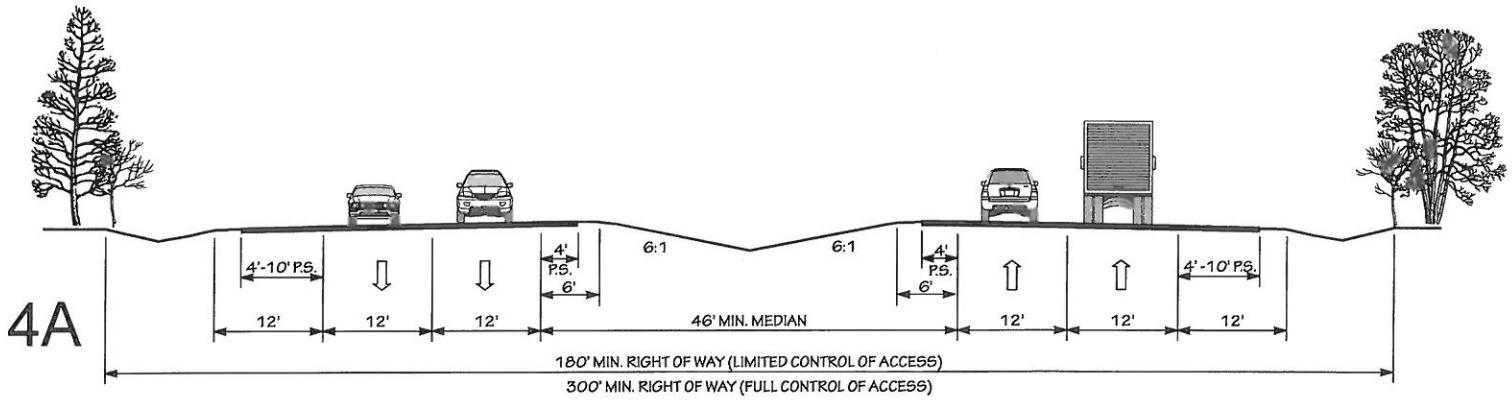
3C



2 LANE WITH TWO WAY LEFT TURN LANE, CURB & GUTTER, BIKE LANES, AND SIDEWALKS

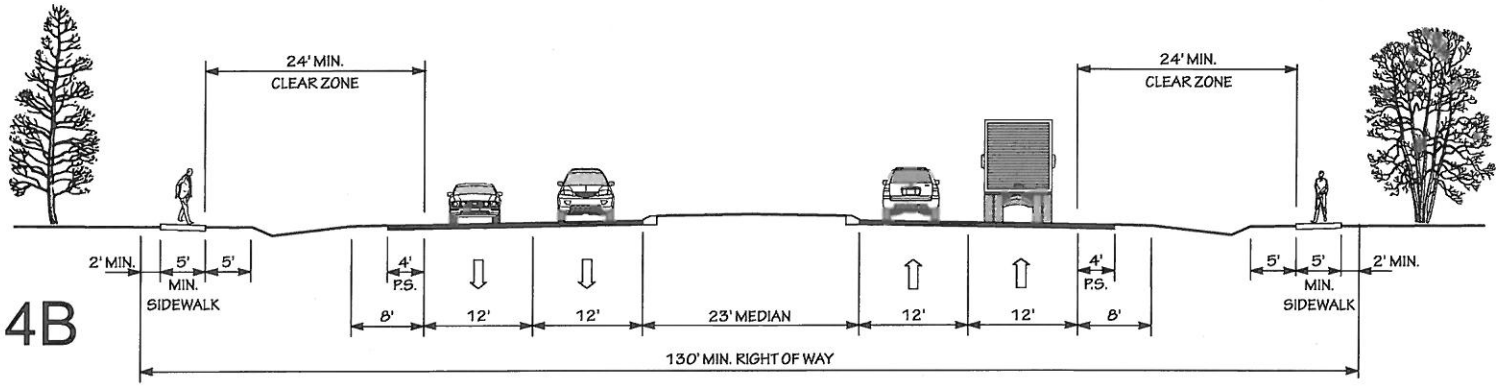
POSTED SPEED 25-45 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS



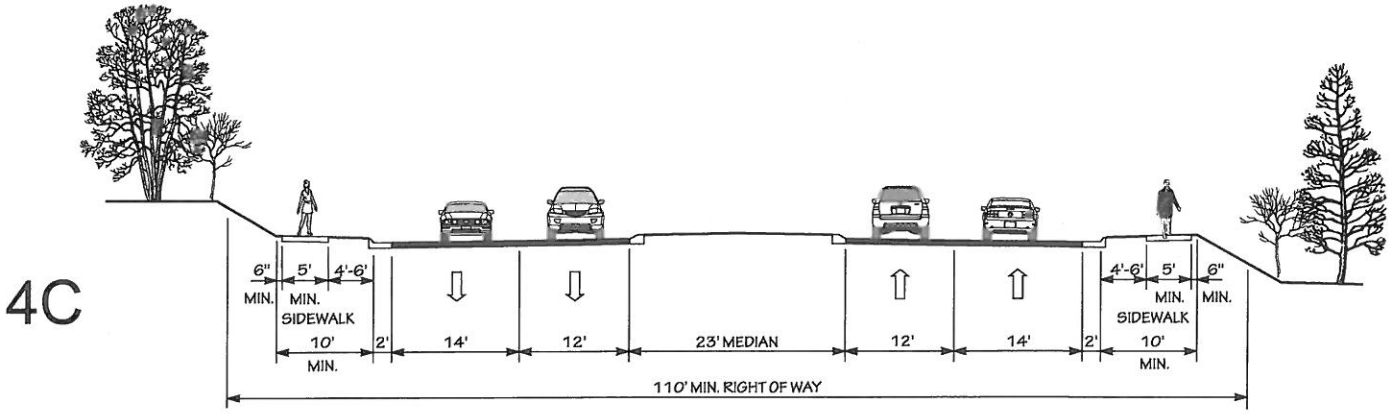
4 LANE DIVIDED (46' DEPRESSED MEDIAN) WITH PAVED SHOULDERS

POSTED SPEED 45-70 MPH



4 LANE DIVIDED (23' RAISED MEDIAN) WITH PAVED SHOULDERS AND SIDEWALKS

POSTED SPEED 35-55 MPH

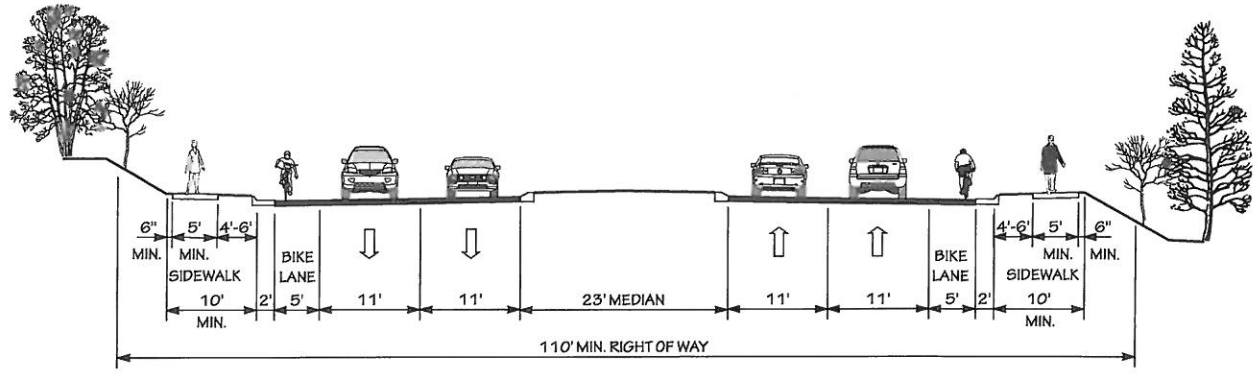


4 LANE DIVIDED (23' RAISED MEDIAN) WITH CURB & GUTTER, WIDE OUTSIDE LANES, AND SIDEWALKS

POSTED SPEED 35-45 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS

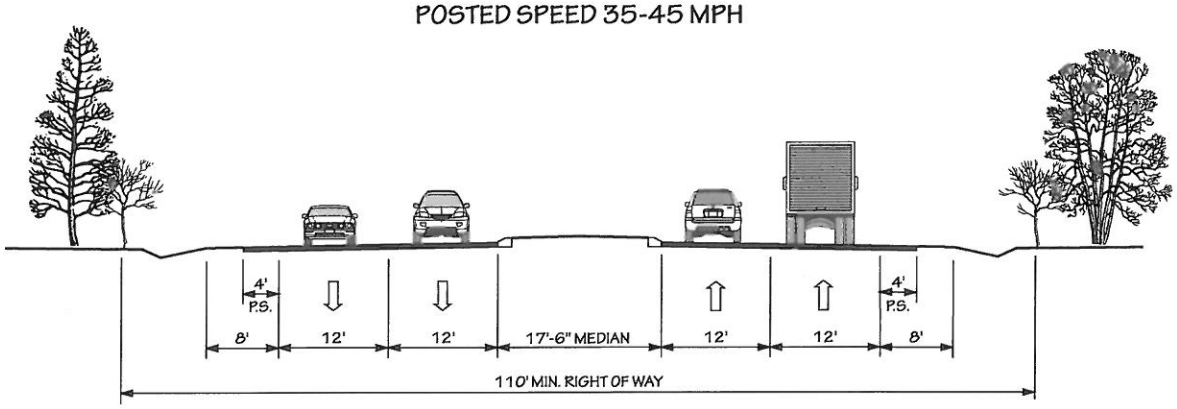
4D



4 LANE DIVIDED (23' RAISED MEDIAN) WITH CURB & GUTTER, WIDE OUTSIDE LANES, BIKE LANES, AND SIDEWALKS

POSTED SPEED 35-45 MPH

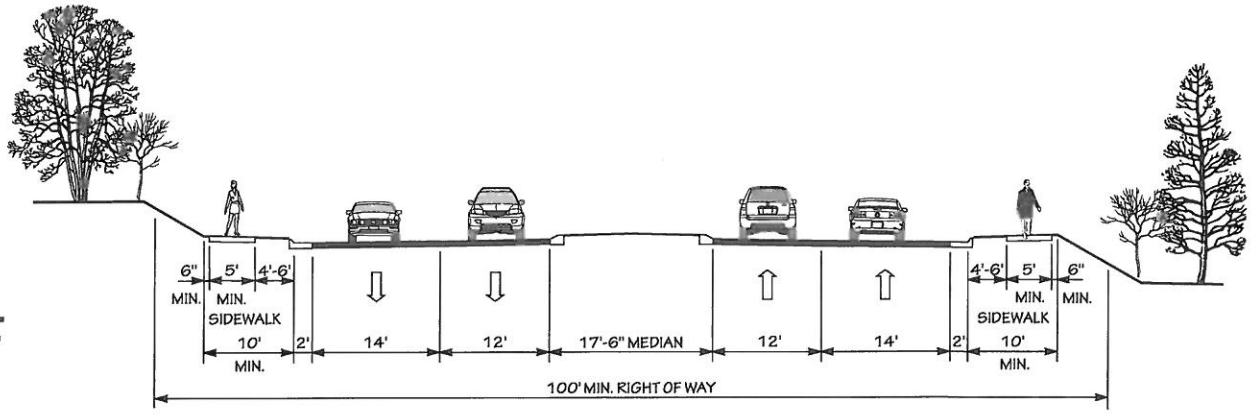
4E



4 LANE DIVIDED (17'-6" RAISED MEDIAN) WITH PAVED SHOULDERS AND SIDEWALKS

POSTED SPEED 35-55 MPH

4F

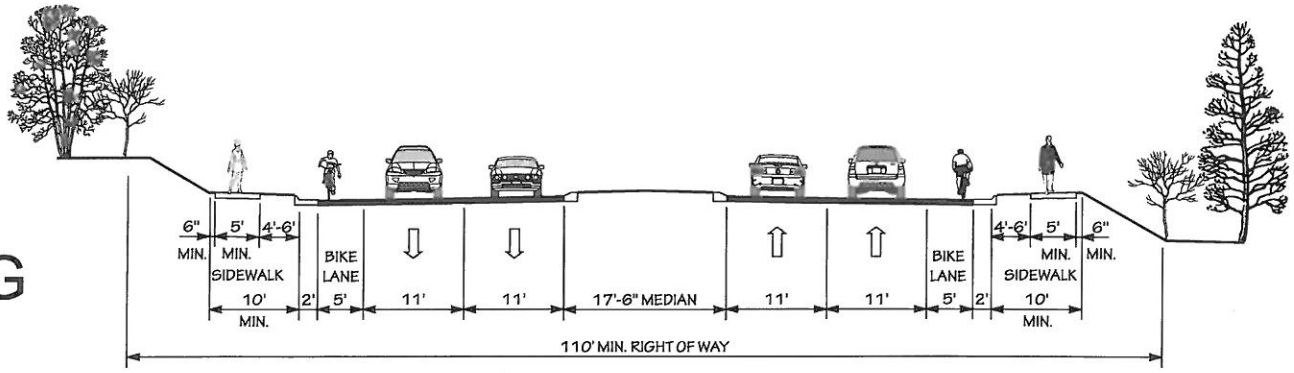


4 LANE DIVIDED (17'-6" RAISED MEDIAN) WITH CURB & GUTTER, WIDE OUTSIDE LANES, AND SIDEWALKS

POSTED SPEED 35-45 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS

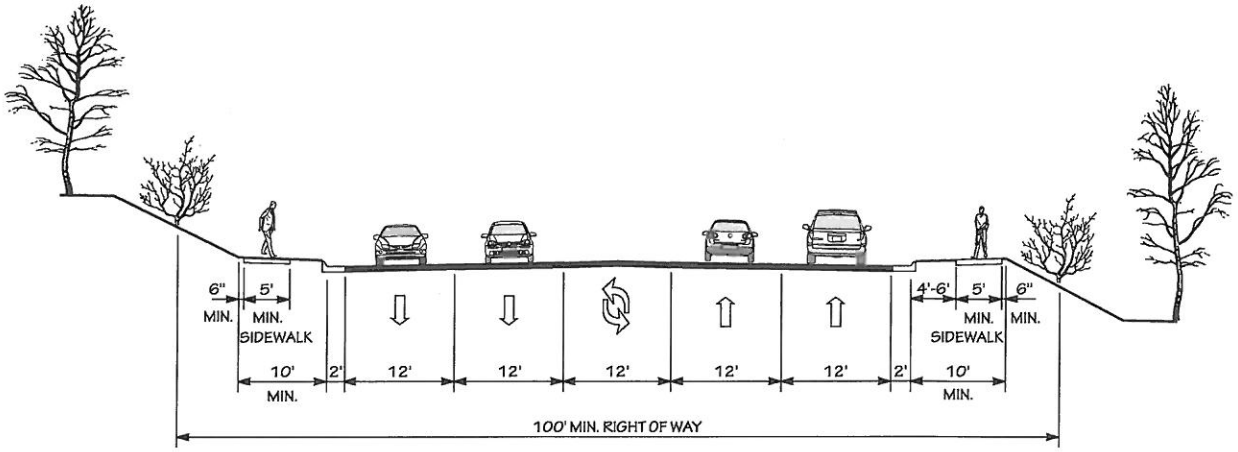
4G



4 LANE DIVIDED (17'-6" RAISED MEDIAN) WITH CURB & GUTTER, BIKE LANES, AND SIDEWALKS

POSTED SPEED 35-45 MPH

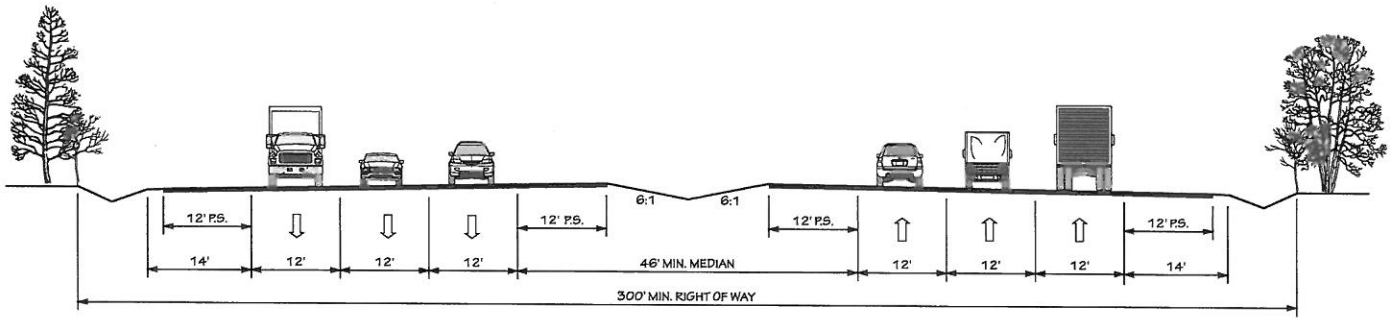
5A



4 LANE WITH TWO WAY LEFT TURN LANE, CURB & GUTTER, AND SIDEWALKS

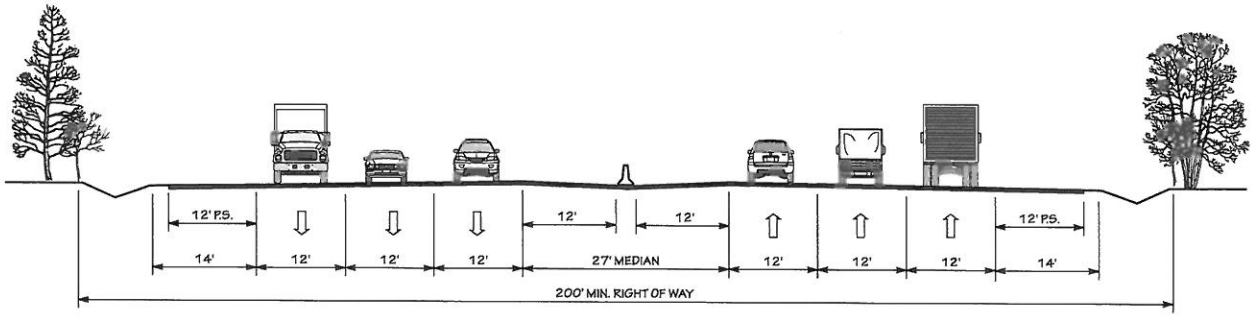
POSTED SPEED 35-45 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS



6A 6 LANE DIVIDED (46' DEPRESSED MEDIAN) WITH PAVED SHOULDERS

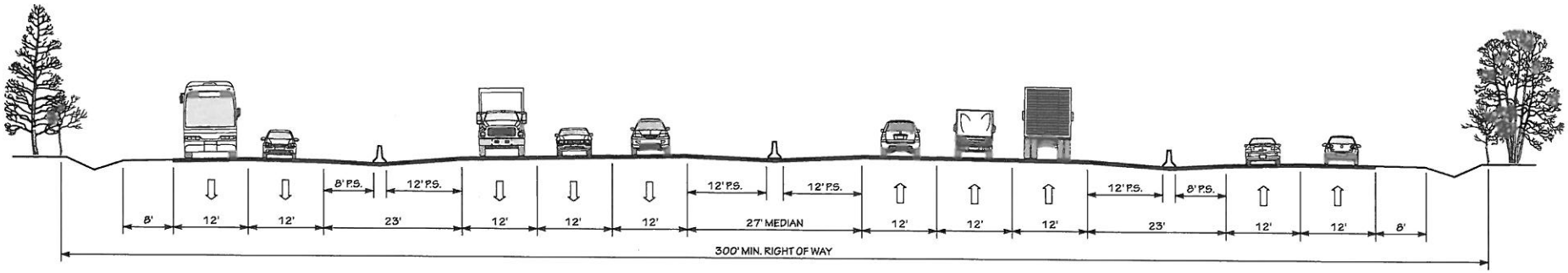
POSTED SPEED 45-70 MPH



6B 6 LANE DIVIDED (27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS

POSTED SPEED 55-70 MPH

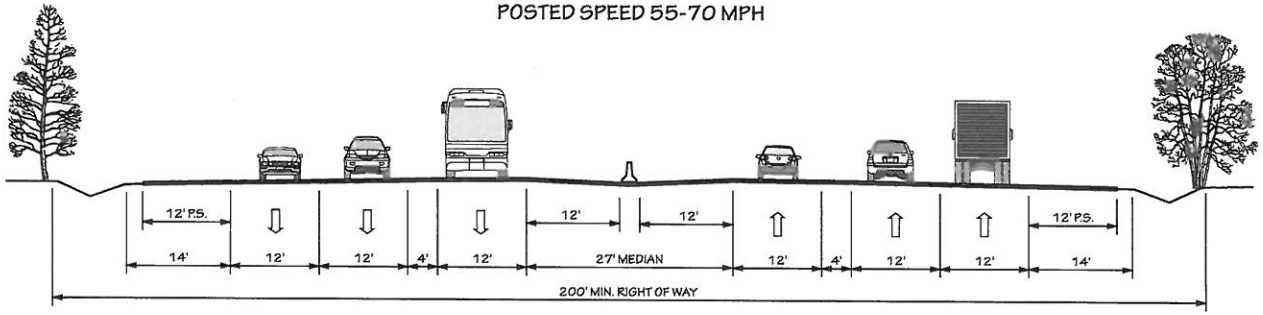
"TYPICAL" HIGHWAY CROSS SECTIONS



6C

6 LANE FREEWAY (27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS AND 2 LANE ONE-WAY SERVICE ROADS EACH SIDE

POSTED SPEED 55-70 MPH

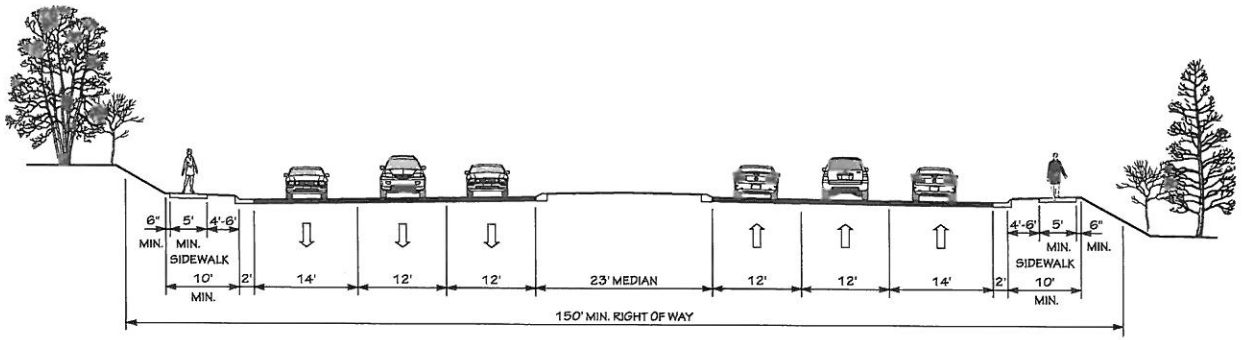


6D

6 LANE FREEWAY (4 GENERAL PURPOSE LANES, 2 MANAGED LANES, AND 27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS

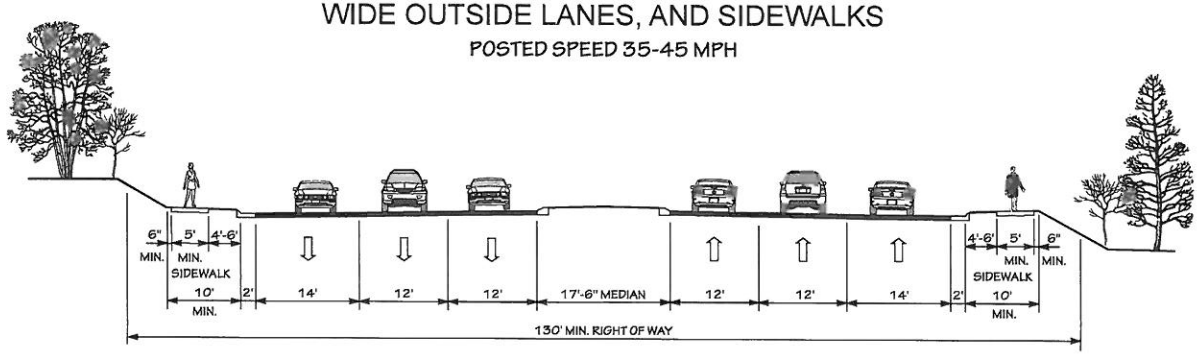
POSTED SPEED 55-70 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS



6E 6 LANE DIVIDED (23' RAISED MEDIAN) WITH CURB & GUTTER, WIDE OUTSIDE LANES, AND SIDEWALKS

POSTED SPEED 35-45 MPH

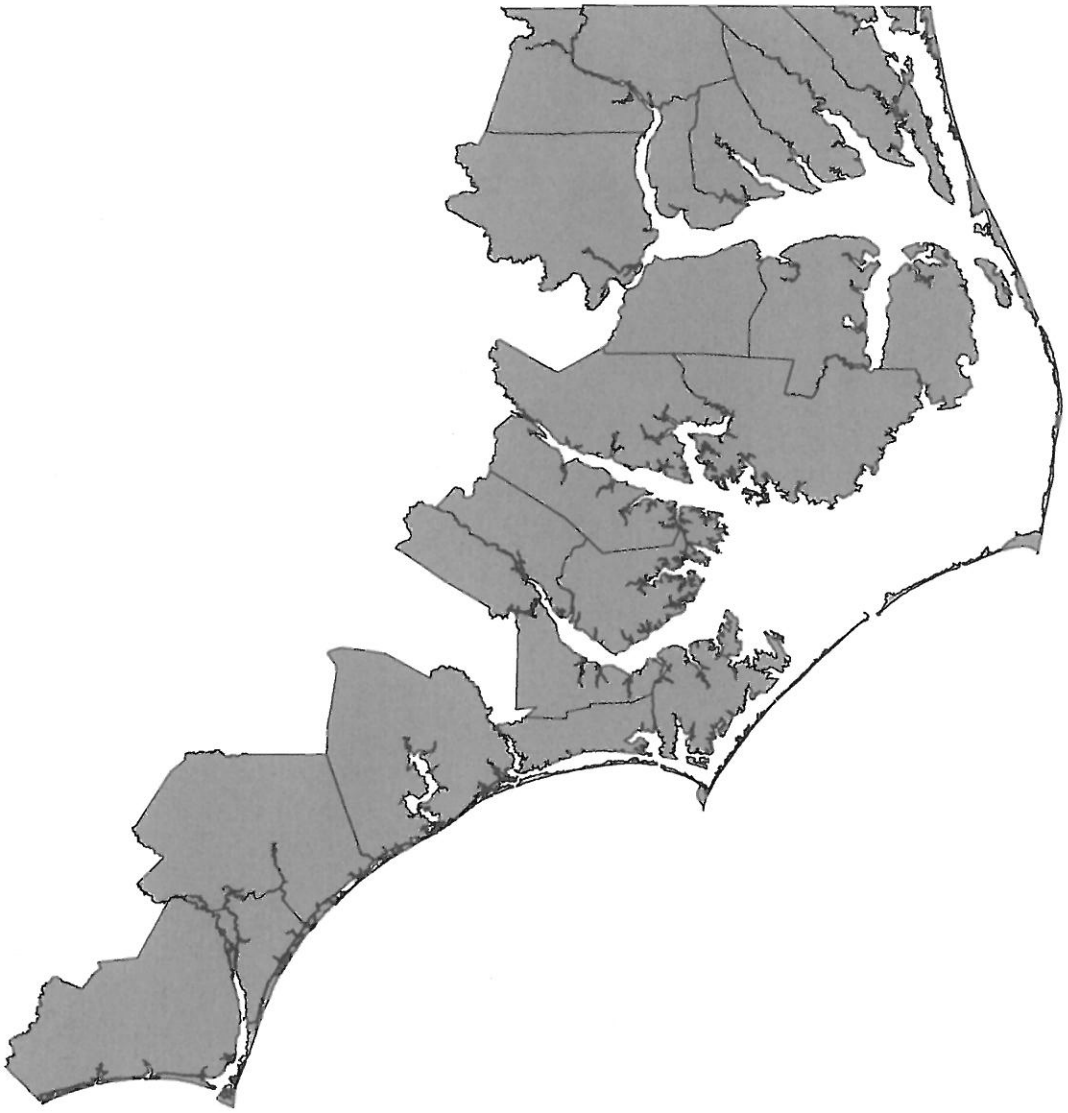


6F 6 LANE DIVIDED (17'-6" RAISED MEDIAN) WITH CURB & GUTTER, WIDE OUTSIDE LANES, AND SIDEWALKS

POSTED SPEED 35-45 MPH

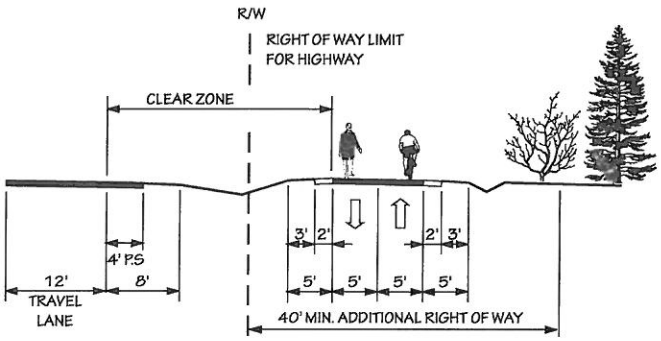
CAMA COUNTIES

Beaufort
Bertie
Brunswick
Camden
Carteret
Chowan
Craven
Currituck
Dare
Gates
Hertford
Hyde
New Hanover
Onslow
Pamlico
Pasquotank
Pender
Perquimans
Tyrrell
Washington



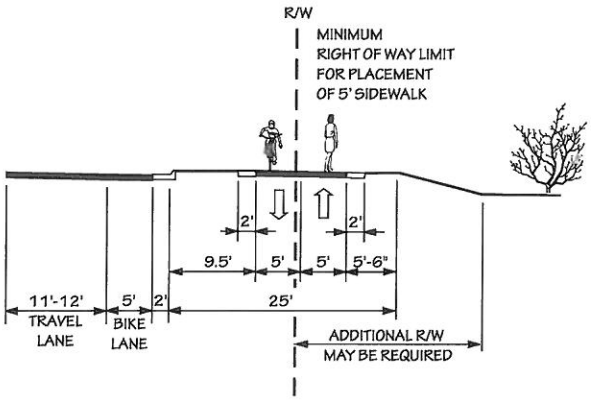
"TYPICAL" HIGHWAY CROSS SECTIONS

M A



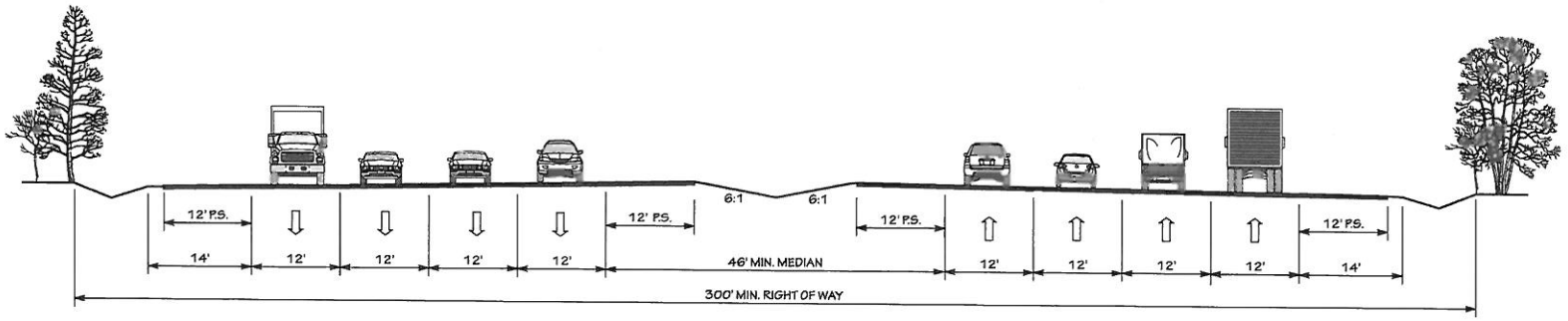
MULTI - USE PATH
ADJACENT TO RIGHT OF WAY OR SEPARATE PATHWAY

M B



MULTI - USE PATH ADJACENT TO CURB AND GUTTER

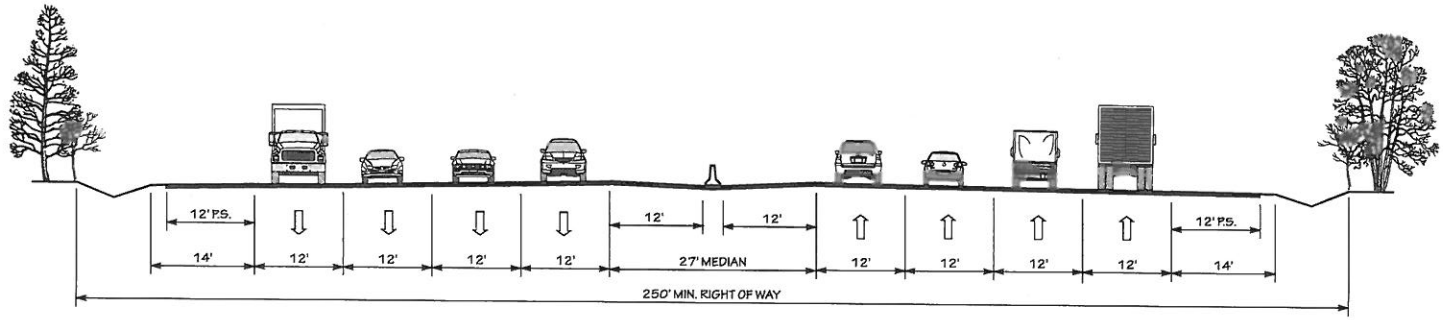
"TYPICAL" HIGHWAY CROSS SECTIONS



8A

8 LANE DIVIDED (46' DEPRESSED MEDIAN) WITH PAVED SHOULDERS

POSTED SPEED 45-70 MPH

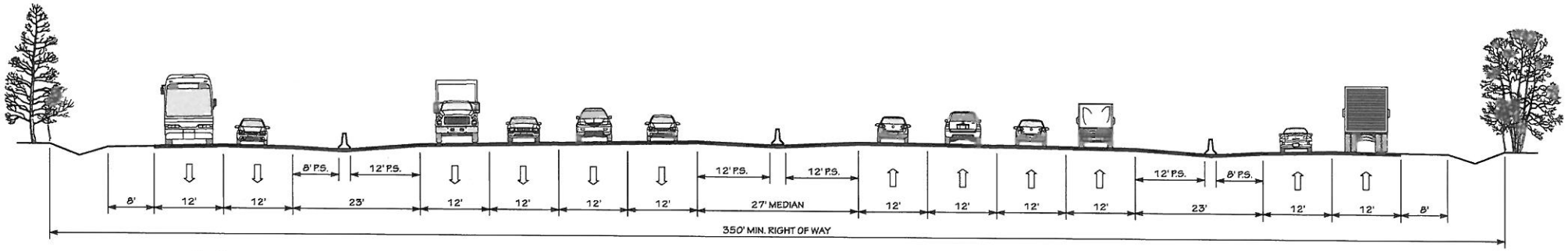


8B

8 LANE DIVIDED (27' MEDIAN WITH JERSEY BARRIER)
WITH PAVED SHOULDERS

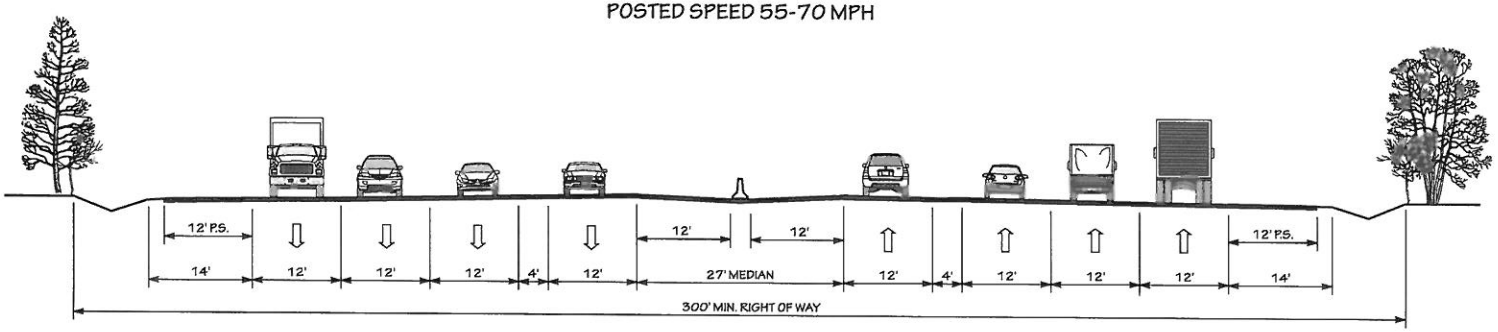
POSTED SPEED 55-70 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS



8C 8 LANE FREEWAY (27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS AND 2 LANE ONE-WAY SERVICE ROADS EACH SIDE

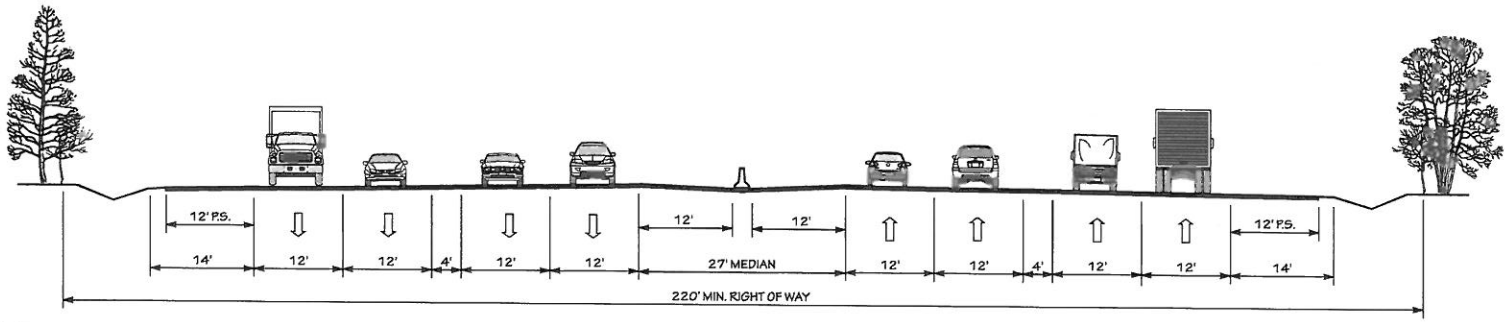
POSTED SPEED 55-70 MPH



8D 8 LANE FREEWAY (6 GENERAL PURPOSE LANES, 2 MANAGED LANES, AND 27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS

POSTED SPEED 55-70 MPH

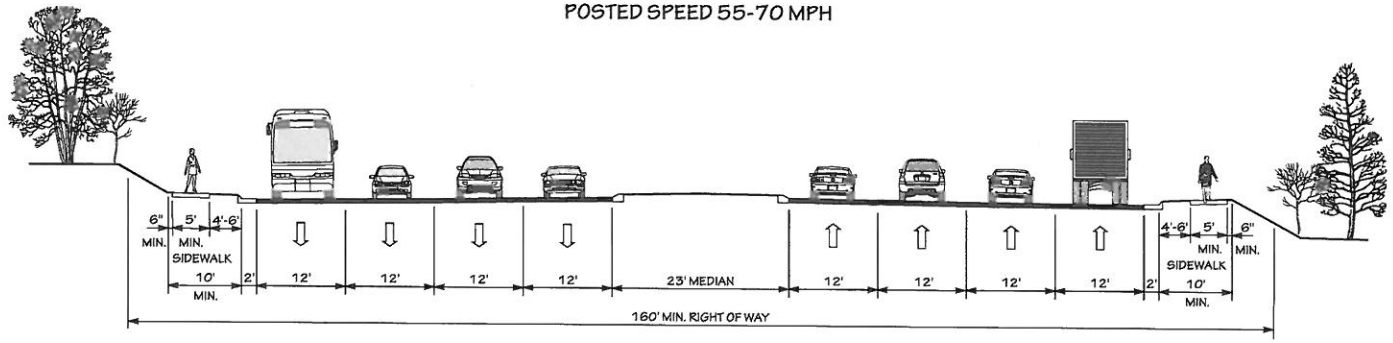
"TYPICAL" HIGHWAY CROSS SECTIONS



8E

8 LANE FREEWAY (4 GENERAL PURPOSE LANES, 4 MANAGED LANES, AND 27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS

POSTED SPEED 55-70 MPH

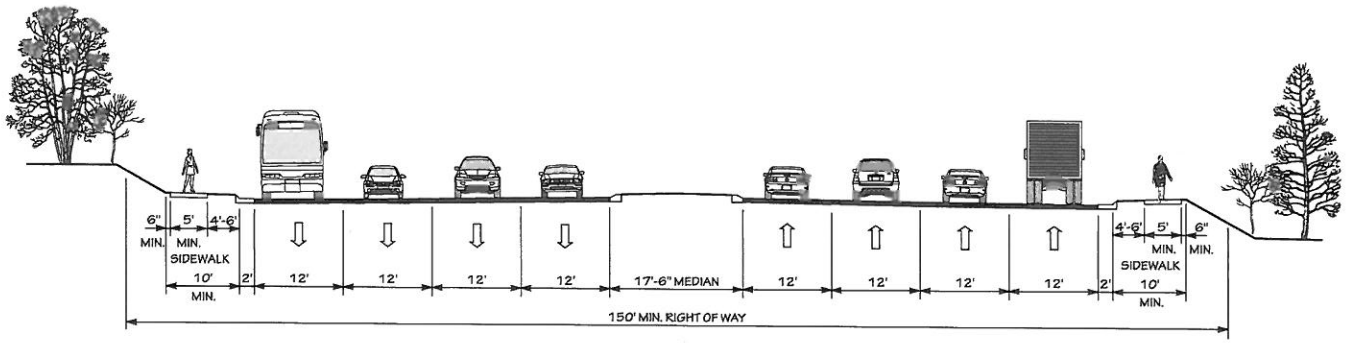


8F

8 LANE DIVIDED (23' RAISED MEDIAN) WITH CURB & GUTTER, AND SIDEWALKS

POSTED SPEED 35-45 MPH

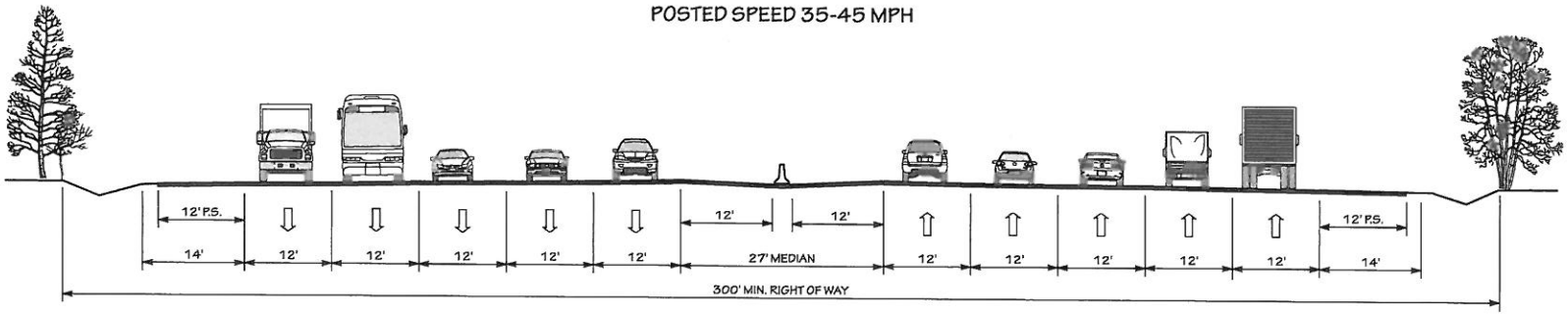
"TYPICAL" HIGHWAY CROSS SECTIONS



8G

8 LANE DIVIDED (17'-6" RAISED MEDIAN) WITH CURB & GUTTER, AND SIDEWALKS

POSTED SPEED 35-45 MPH

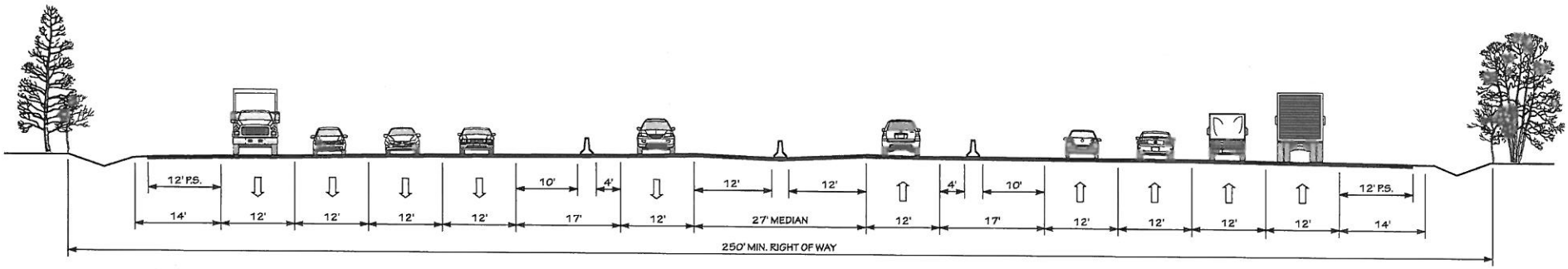


10A

10 LANE DIVIDED (27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS

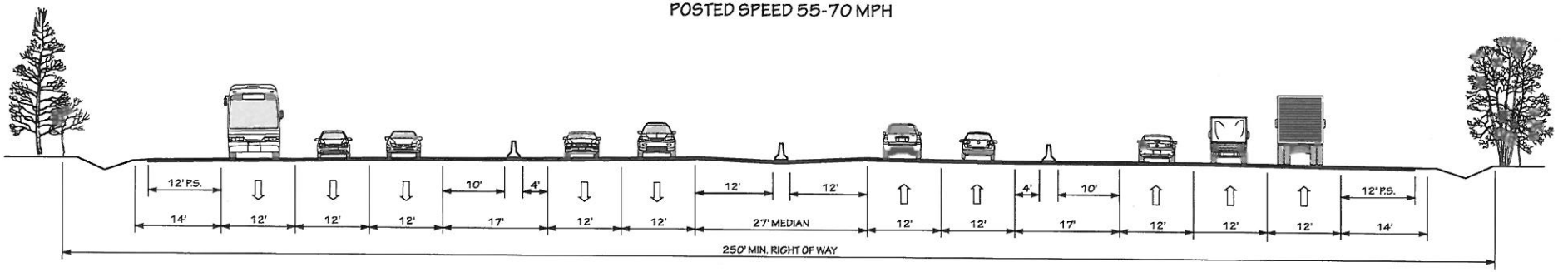
POSTED SPEED 55-70 MPH

"TYPICAL" HIGHWAY CROSS SECTIONS



10B 10 LANE FREEWAY (8 GENERAL PURPOSE LANES, 2 MANAGED LANES, AND 27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS

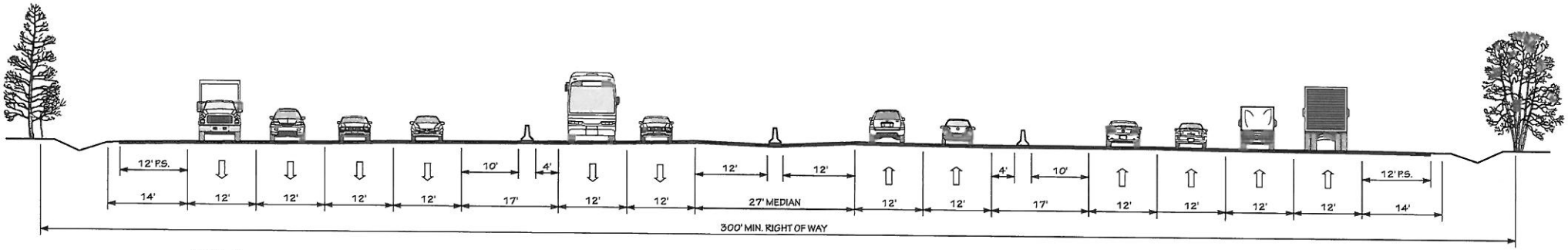
POSTED SPEED 55-70 MPH



10C 10 LANE FREEWAY (6 GENERAL PURPOSE LANES, 4 MANAGED LANES, AND 27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS

POSTED SPEED 55-70 MPH

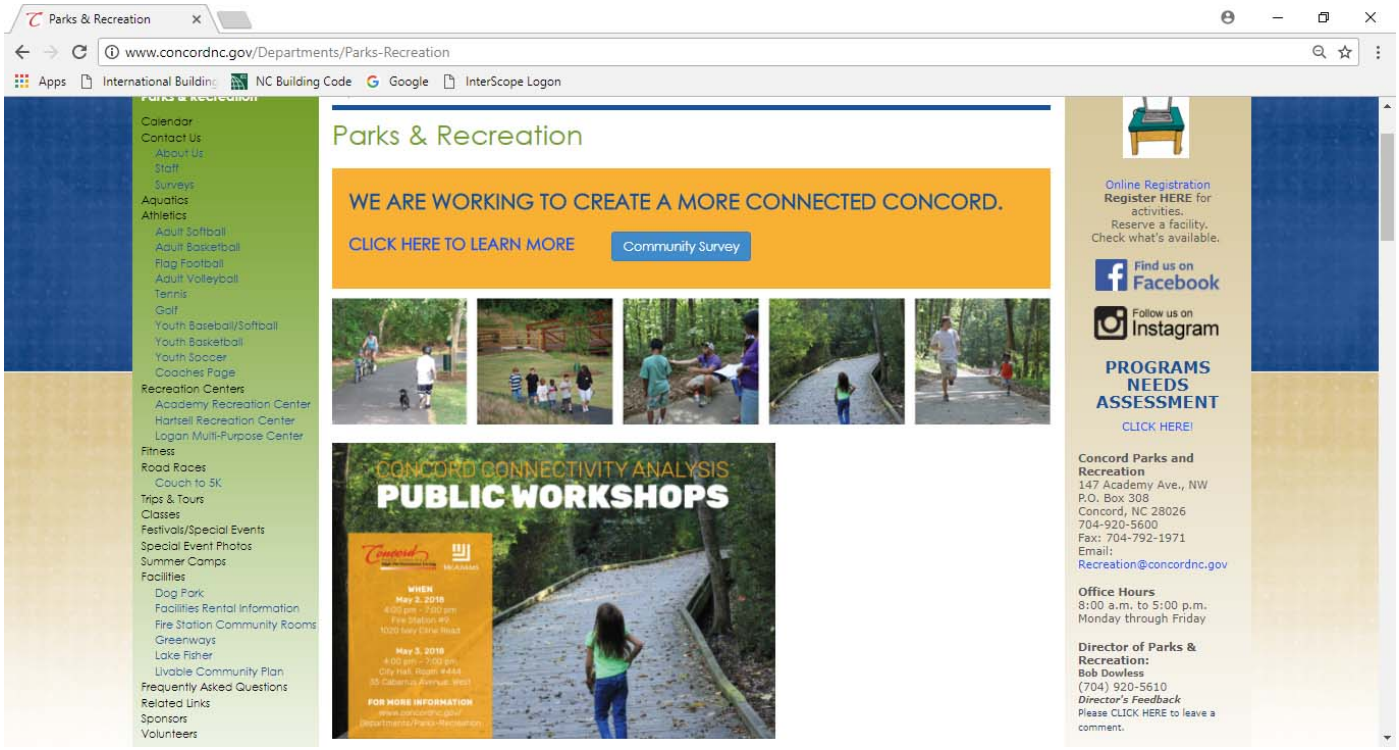
"TYPICAL" HIGHWAY CROSS SECTIONS



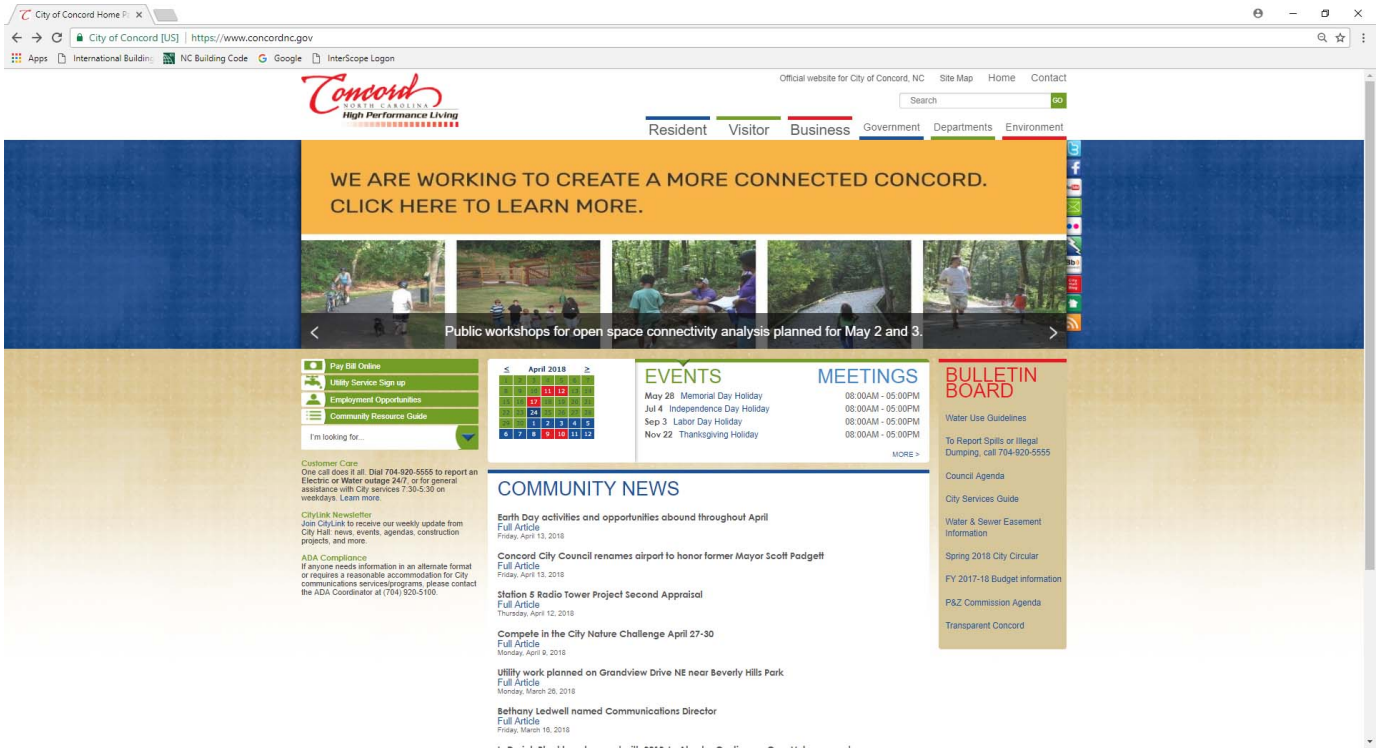
12A 12 LANE FREEWAY (8 GENERAL PURPOSE LANES, 4 MANAGED LANES, AND 27' MEDIAN WITH JERSEY BARRIER) WITH PAVED SHOULDERS

POSTED SPEED 55-70 MPH

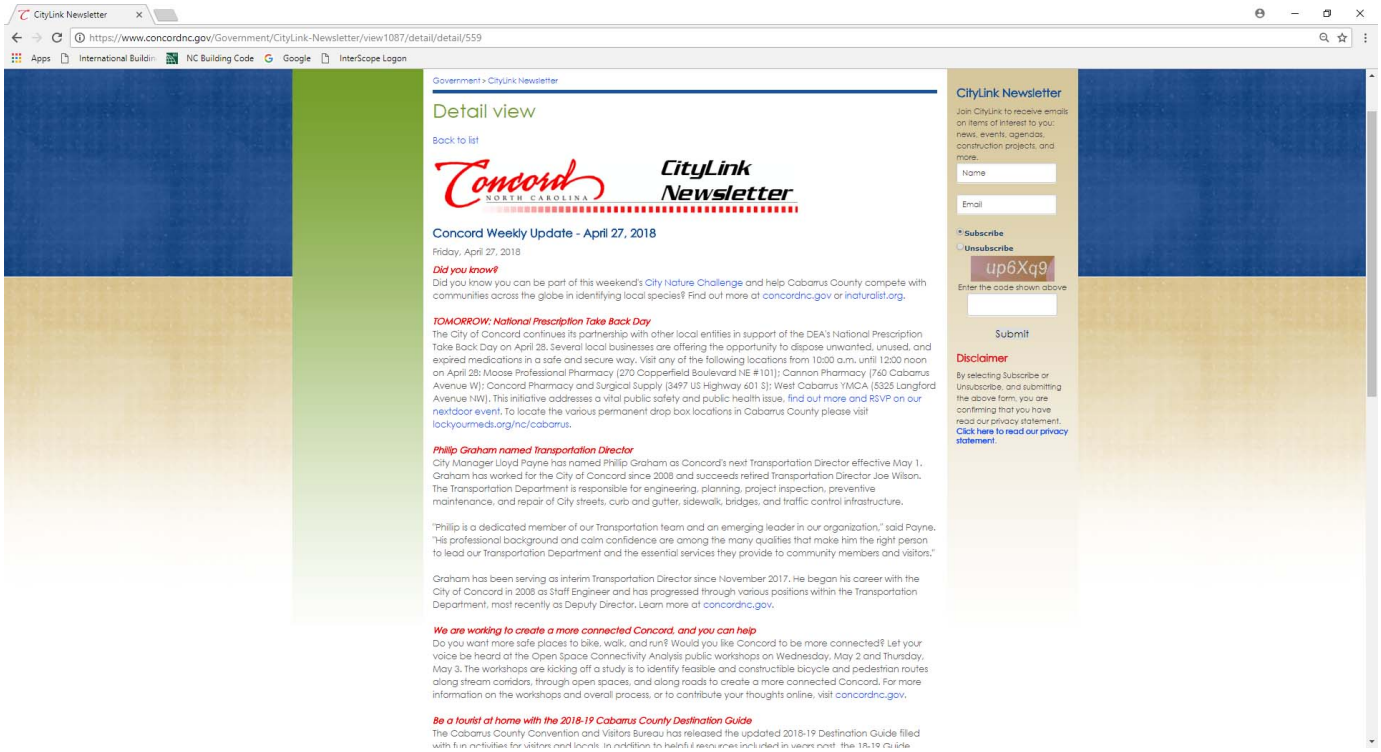
Parks and Recreation Website



City of Concord Website



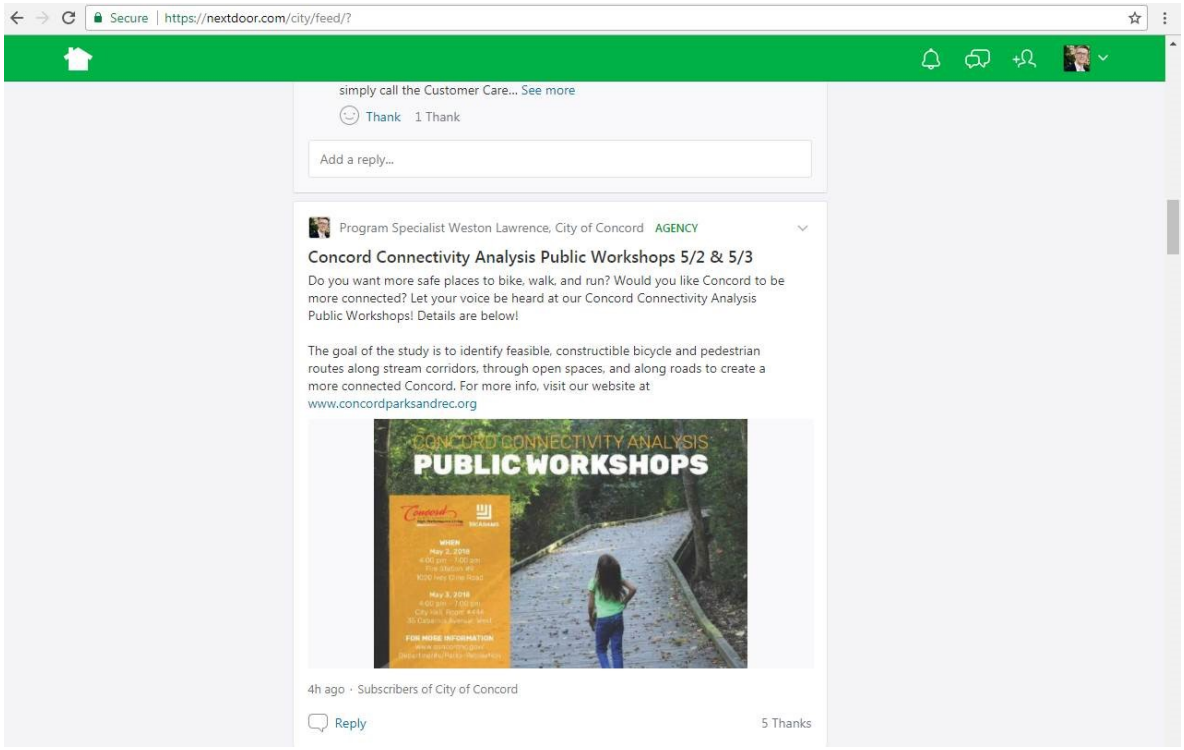
CityLink Newsletter



Parks and Recreation Facebook Page - Meeting Post



Next Door - Meeting Post



Active Net Email Blast

Email Report

Apr 26, 2018
8:41 AM

Customer Zip / Postal Code: 28025, 28026, 28027
Family Role: Adult, Friend, Grandparent, Guardian, Other, Parent

Email

Address From: Recreation [recreation@concordnc.gov]
Subject Text: Open Space Connectivity Survey and Workshop
Body Type: HTML
Body Text:

TheCity of Concord Parks and Recreation Department is working with a consultant toprepare an Open Space Connectivity Analysis and Greenway Master Plan for theCity, with the goal of identifying new bicycle and pedestrian routes to createa more connected Concord. Your opinion matters and we invite all citizensto provide input either by attending one of our public workshops or by fillingout an online survey. The workshops are from 4:00 - 7:00 PM on May 2,2018 at Fire Station #9 (1020 Ivey Cline Road), or May 3, 2018 at City Hallroom #444 (35 Cabarrus Avenue West).

Please click here to access the online survey.

For additional questions, please call 704-920-5600

Regards,

City of Concord Parks and Recreation Team

Concord Parks and Recreation
147 Academy Ave
PO Box 308
Concord, NC
28026

CONCORD CONNECTIVITY ANALYSIS
PROJECT DESCRIPTION

The City of Concord is in the process of preparing an open space connectivity analysis and Greenway Master Plan as an addendum to Parks and Recreation Master Plan as adopted by City Council in January 2017. The goal of the study is to identify feasible, constructible bicycle and pedestrian routes along stream corridors, through open spaces and along roads to create a more connected Concord.

The study includes:

- Existing conditions evaluation;
- Identification of opportunities and constraints;
- Trail alignment, trail surfacing and access point recommendations;
- Identification of opportunities for new parks and open spaces along recommended trail alignments;
- Acquisition priorities;
- Identification of connection opportunities along roads, sidewalks, and bicycle routes, and to neighborhoods and business hubs;
- Development of conceptual designs and cost estimates; and
- Creation of detailed a 5, 10 and 15 year action plan.

Project goals include:

- To engage the community, elected officials, and staff throughout the planning process;
- To complete a detailed study of the existing Greenway Master Plan to determine the viability of executing the plan over time; and
- To enable the City to achieve their vision of a connected pedestrian and bicycle network by identifying viable, constructible routes and providing supporting information to promote well-informed decisions.

PROJECT PROCESS

A Project Kickoff + Project Advisory Committee Input

- Meet with City of Concord Parks and Recreation Department leadership and Project Advisory Committee.
- Meet with City Planning, Transportation, Engineering, Water Resources, and Building and Grounds Staff for an overview of various physical factors.

B Compile Base Maps + Document Existing Conditions

- Gather and compile/coordinate information and data from various local and state agencies.
- Conduct site tours to various current and proposed greenway and trail corridors to inventory and observe conditions as a basis for planning.

C Corridor Analysis + Preliminary Alternatives

- Perform corridor analysis for each greenway and trail to determine alignment opportunities and constraints.
- Investigate partnership opportunities to pair greenway development and land acquisition with stream restoration and conservation efforts.
- Identify key destinations and activity hubs to clearly show the connectivity thorough the system.
- Identify typical trail cross sections, trail heads and open space areas.
- Identify/develop other details (conceptual signage, landscaping, trail design, and relationships to sidewalks, paths, and street intersections).
- Develop analysis with permitting, construction, maintenance and user experience in mind.

D Community Input + Guidance

- Facilitate a public outreach meeting to introduce the project and gauge public support.
- Facilitate two public workshops to discuss preliminary designs.
- Facilitate focus group meetings with elected officials and key staff members.
- Draft a summary of the public participation process and its results.

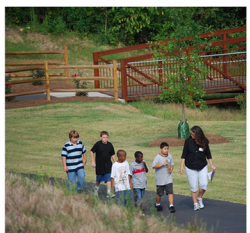
E Plan Refinement + Implementation

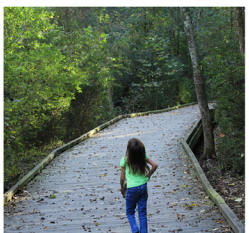
- Break the overall network into meaningful segments with logical begin and end points that are suitable in length and scope for individual projects (0.5 - approx. 2 miles).
- Utilize ranking criteria in the establishment of prioritized segments.
- Prepare cut sheets for each segment that are teed up for grant applications and construction packages.
- Develop a recommended maintenance program that identifies minimum tasks and schedules.
- Identify potential funding sources, compile criteria and requirements, and relate anticipated schedule of funding to the target projects.
- Explore various funding options from public and private sources to determine availability and requirements for grants.

F Action Plan + Executive Summary

- Prepare an Action Plan that outlines the priority trails and greenways based on a 15-year implementation plan.
- Present Action Plan to Staff and the Project Advisory Committee for review and comment.
- Following the input session with the Project Advisory Committee, hold a public meeting to solicit feedback regarding the Action Plan.
- Provide final Plan to Department staff for their use and adoption.
- Participate in presentation to the City of Concord City Council to adopt the plan.

MCADAMS




Welcome! We want to hear your vision for Concord's bicycle and pedestrian connectivity needs! The Connectivity Analysis Study process gathers information from many sources, crafts a vision for the future, and identifies feasible, constructable bicycle and pedestrian routes to create a more connected Concord.

You are here!

1 INVENTORY + LISTENING

Gathering information and public input to inform the planning process, vision and recommendations.

- Community Values
- How?
- Where?
- Why?
- What Route?

2 ANALYSIS

The inventory and analysis phase culminates in a vision for the future of Concord's connected bicycle and pedestrian system.



3 PLAN RECOMMENDATIONS

Goals and objectives for achieving the vision of Concord's connected bicycle and pedestrian system. This includes specific, achievable goals with implementation strategies

- Facility Type
- Route
- Funding
- Prioritization

Concord NORTH CAROLINA High Performance Living

McAdams

EXECUTIVE SUMMARY

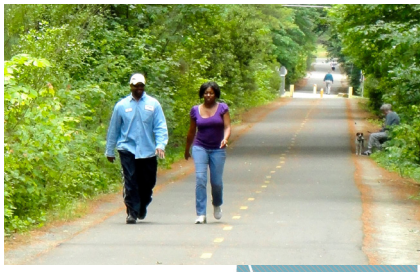
Evaluating the **ECONOMIC IMPACT** of **SHARED USE PATHS** in North Carolina

MARCH 2018

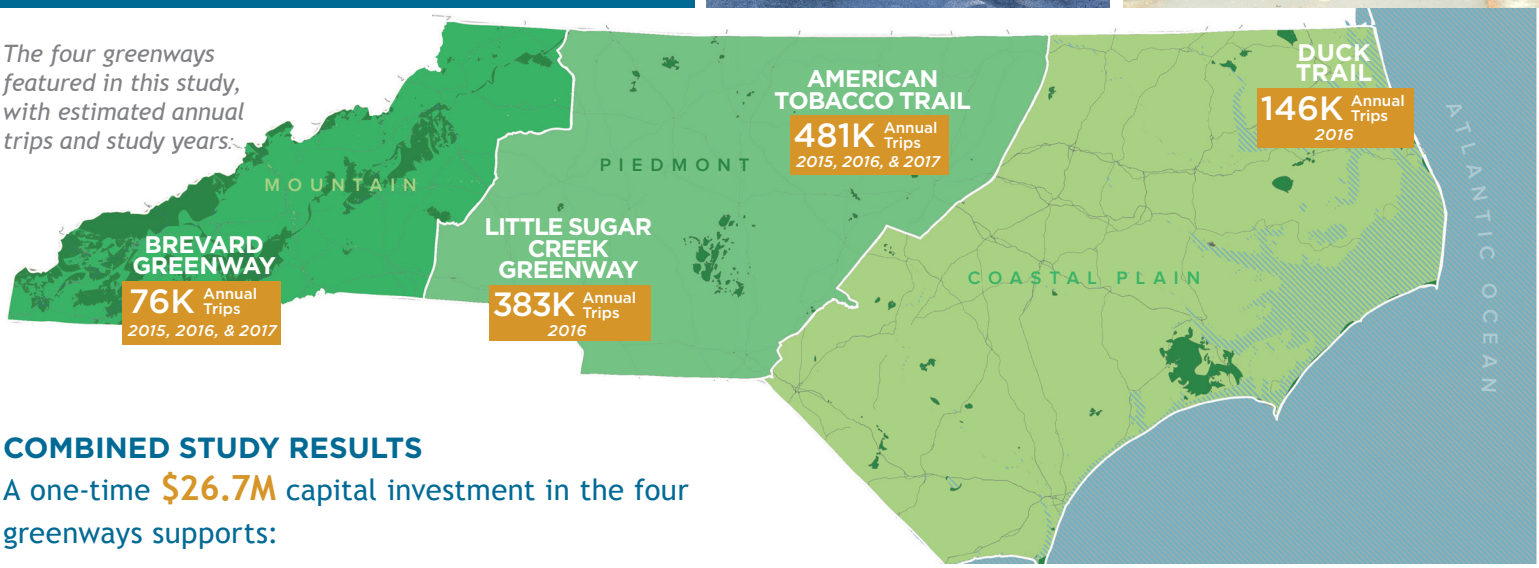


Shared use paths, also known as GREENWAYS, provide a shared space for bicycle and pedestrian travel outside of the roadway. This project's objective was to design and test an approach for measuring the economic contributions of greenways in North Carolina.





The four greenways featured in this study, with estimated annual trips and study years:



COMBINED STUDY RESULTS

A one-time **$26.7M** capital investment in the four greenways supports:

$19.4M

Estimated annual sales revenue at local businesses along the four greenways

$684K

Estimated annual local and state sales tax revenue from businesses along the greenways

$25.7M

Estimated annual savings due to more physical activity, less pollution and congestion, and fewer traffic injuries from use of the greenways

$48.7M

Estimated business revenue from greenway construction

790 JOBS

Are supported annually through greenway construction

RETURN ON INVESTMENT: Every **$1.00** of trail construction supports **$1.72** ***annually*** from local business revenue, sales tax revenue, and benefits related to health and transportation.





ITRE | alta PLANNING + DESIGN | Division of Bicycle & Pedestrian Transportation

By: The Institute for Transportation Research and Education and Alta Planning + Design

For: NCDOT Division of Bicycle and Pedestrian Transportation

FULL REPORT: **go.ncsu.edu/sharedusepaths**

COMMUNITY VALUES

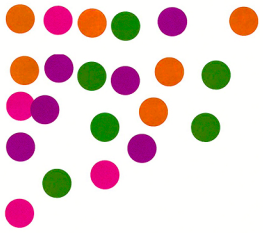
WHICH VALUES ARE MOST IMPORTANT TO YOU?

HEALTH + FITNESS

I believe that personal health and fitness are important.

Within your local bicycle and pedestrian system, you may seek out opportunities to run, jog, walk or bike, either self directed or with an organized group, or engage in other activities that contribute to overall health and fitness.

THIS IS VERY IMPORTANT TO ME



PEOPLE + COMMUNITY

I believe that relationships and a sense of community and belonging are important.

Within your local bicycle and pedestrian system, you may seek out opportunities to attend community events, gather with family and friends or register for group camps or activities.

THIS IS VERY IMPORTANT TO ME

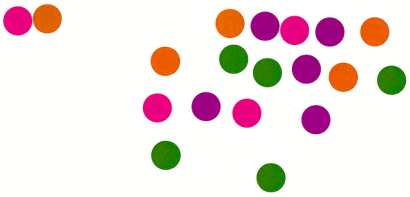


ENVIRONMENT + NATURE

I believe that preserving and engaging with the environment is important.

Within your local bicycle and pedestrian system, you may seek out opportunities for nature walks that directly connect you with nature while preserving habitat and ecological functions.

THIS IS VERY IMPORTANT TO ME



HISTORY + CULTURE

I believe that our history and our culture are important.

Within your local bicycle and pedestrian system, you may seek out opportunities to visit historical sites, attend a cultural heritage event, view public art, or learn about history and culture through interpretive trails.

THIS IS VERY IMPORTANT TO ME

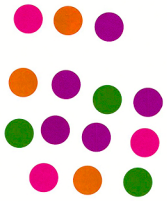


EDUCATION + LEARNING

I believe that lifelong learning and teaching for people of all ages is important.

Within your local bicycle and pedestrian system, you may seek out opportunities for learning about new things through your surroundings. You may prefer pedestrian routes that offer new activities and provide interpretive signage.

THIS IS VERY IMPORTANT TO ME



Concord NORTH CAROLINA High Performance Living

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CITY OF CONCORD PARKS + RECREATION CONNECTIVITY ANALYSIS

PUBLIC INPUT MEETING

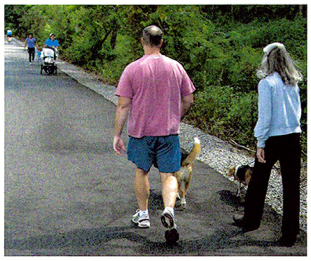
BICYCLE & PEDESTRIAN CONNECTIONS

HOW?

BIKE



WALK



RUN



HIKE



OTHER



FACILITY TYPE?

GREENWAYS



MULTI-USE PATHS



PROTECTED BIKE LANES



BUFFERED BIKE LANES



BIKE LANES | SIDEWALKS



Most Protected

Least Protected

Concord NORTH CAROLINA High Performance Living

McAdams

CITY OF CONCORD PARKS + RECREATION CONNECTIVITY ANALYSIS

PUBLIC INPUT MEETING

BICYCLE & PEDESTRIAN CONNECTIONS

WHY?

CONNECT WITH NATURE



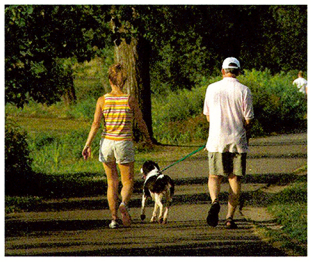
TAKE SHORT TRIPS | RUN ERRANDS



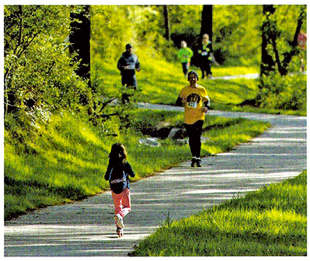
SPEND TIME WITH FAMILY



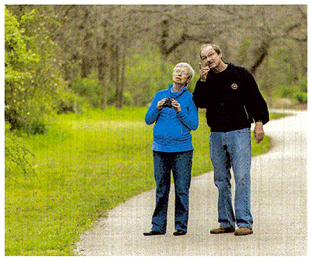
WALK A PET



IMPROVE HEALTH + FITNESS



SHOW VISITORS MY COMMUNITY



LEARN



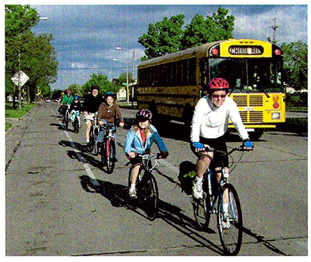
RELIEVE STRESS



COMMUTE TO WORK



COMMUTE TO SCHOOL



Concord NORTH CAROLINA High Performance Living

McAdams

CITY OF CONCORD PARKS + RECREATION CONNECTIVITY ANALYSIS

PUBLIC INPUT MEETING

ADDITIONAL COMMENTS

- NW Concord, near Concord Mills, is really lacking in connectivity. Please budget a lot more for connectivity via sidewalks, multipurpose paths, greenways.
  - instead of concrete, asphalt paths would be good enough.
  - would love to be able to walk to restaurant and grocery stores (i.e. Earth Fare, Lidl)

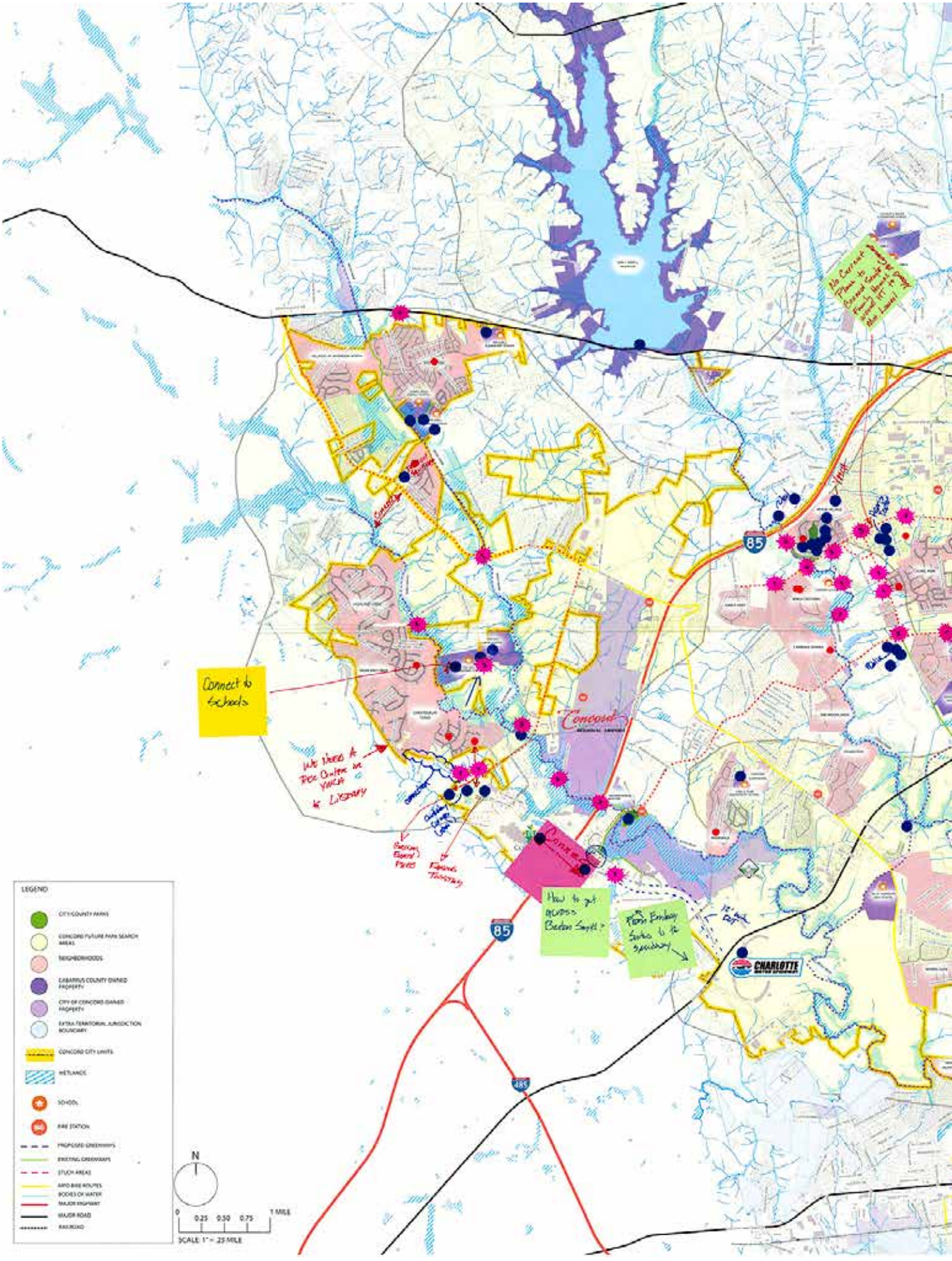
+ sidewalks on Poplar Tent

- CONNECTION OF McEACHERN GREEN TO BUNKER
- CONNECTION OF HOTELS/SPEEDWAY TO CONCORD MILLS
- GREENWAYS CONNECTING LOGAN COMMUNITY TO DOWNTOWN AND OTHER GREENWAYS

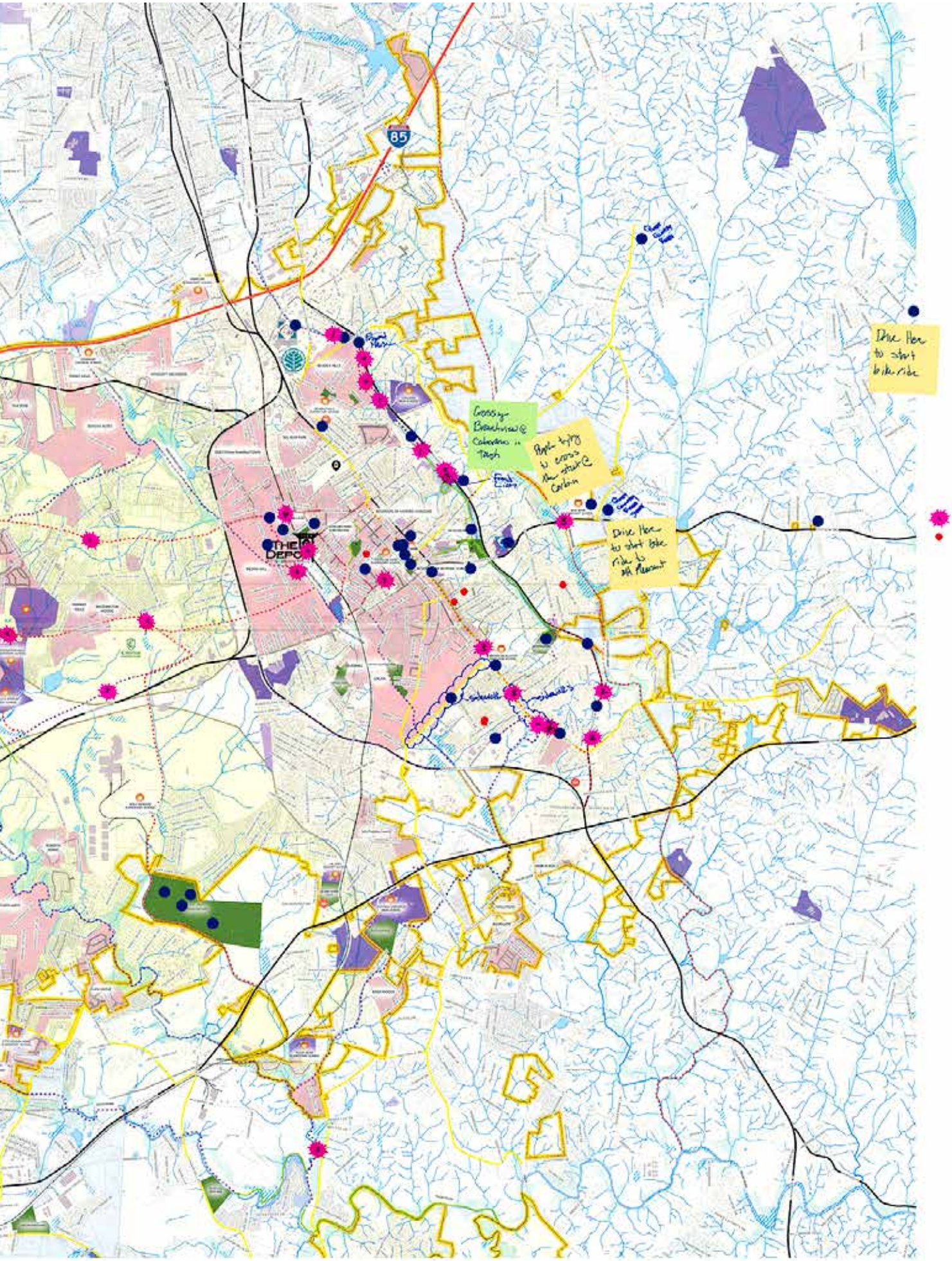
- ~~NEED~~ WAYFINDING ON TRAILS NEEDS TO BE BETTER / MORE MAP KIOSKS NEED TO BE OUT THERE
- Sculptures on trails - local or area connected artisians or painted (murals) sides of buildings
- Interactive things on pavement - hopscotch, etc.
- Paths wide enough to allow bikers & walkers to co-exist
- Law enforcement on trails -> build community
- Emergency light system & location markers for use in case of emergency to communicate 1st Responders
- Distance Markers - painted or markers that correspond to wayfinding/directional information is on maps & kept current on website
- Southwest quarter severely lacking city park / trails / community center / library
- Bistros, bike shop etc along trail system or accessible
- Community education programs using trail system - bird watching, bike safety, trekking

- TRAILS SHOULD START IN HIGH POP. DENSITY AREAS, E.G. HISTORIC DISTRICT, AND RADIATE OUTWARD TO OTHER AREAS LIKE SPOKES ON A WHEEL SO THAT THE TRAILS GO SOMEWHERE AS OPPOSED TO DISCONNECTED SECTIONS OF TRAIL THAT ARE ESSENTIALLY ISOLATED.

Continue to seek incorporation of bike/ped/complete streets elements as part of NC DOT projects.



Connect to Schools
Concord
85
485
CHARLOTTE
LEGEND
CITY/COUNTY PARKS
CONCORD FUTURE PARK SEARCH AREAS
NEIGHBORHOODS
CABARRUS COUNTY OWNED PROPERTY
CITY OF CONCORD OWNED PROPERTY
EXTRA TERRITORIAL JURISDICTION BOUNDARY
CONCORD CITY LIMITS
WETLANDS
SCHOOL
FIRE STATION
PROPOSED GREENWAYS
EXISTING GREENWAYS
STUCK AREAS
AMD BIKE ROUTES
BODIES OF WATER
MAJOR HIGHWAY
MAJOR ROAD
RAILROAD
N
0 0.25 0.50 0.75 1 MILE
SCALE: 1" = .25 MILE


85
Drive Here to start bike ride
Drive Here to start bike ride to Mt Pleasant
THE DEPOT

Concord Connectivity Analysis Community Input

Please note, all fields are optional; you can provide a response to as many or as few of the questions as desired, including contact information.

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.

What improvements would you like to be made to support walking and biking in Concord?

What areas of the City would you like to see have more bike and pedestrian facilities?

What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?

If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.

Name

First Last

Address

Street Address

Address Line 2

City

State / Province / Region

Postal / Zip Code

Country

Email

Phone Number

– ### –

Feedback should be submitted by June 8th. Please drop off completed surveys to any City of Concord Recreation Center, the Cabarrus County Senior Center, or the City of Concord Housing Department or mail to:

Academy Recreation Center
ATTN: Jason Pauling
147 Academy Ave. NW
Concord, NC 28026

You may also access the survey online at www.concordnc.gov/Departments/Parks-Recreation.

Concord Connectivity Analysis Community Input #2

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I like to run the 4 mile greenway loop and the McEachern extension at McGee park.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I and my wife do feel safe on the greenway and the parks, especially during the day.
What improvements would you like to be made to support walking and biking in Concord?	More sidewaks. It would be nice to have a sidewalk on the park side of Corban Ave at McGee Park and have it connect to a crosswalk accoss Branchview. I guess it would be too much to ask for sidewalks on Corban on the other side of Branchview. People who live in the Crestside and Deal St area could walk easily to McGee park.
What areas of the City would you like to see have more bike and pedestrian facilities?	Downtown area
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	It would be great to be able to run/walk/cycle on an extended greenway that connects to Carolina mall and hospital area.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Deal St, Corban and Branchview
Name	Garry Washburn`
Address	174 Deal St SE Concord, NC 28025 United States
Email	ggwashburn@gmail.com
Phone Number	

Created 10 Apr 2018 9:40:29 AM	24.172.81.50 IP Address
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Concord Connectivity Analysis Community Input #3

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	not really, but I would love to make it part of my routine. We do like to take the kids walking/riding when we get a chance
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes, but as a female I am more afraid to go without my dog, only for general reasons. Concord has been a very safe community but one can never be to safe these days.
What improvements would you like to be made to support walking and biking in Concord?	drinking water stations. Maybe even a small splash station along a trail! (small, not extravagant)
What areas of the City would you like to see have more bike and pedestrian facilities?	Along Roberta!
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would walk or bike to Frank Liske if I could get there without the speeders on Roberta. I live on Roberta and hate the traffic
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Roberta/Roberta Church/Stough
Name	
Address	
Email	
Phone Number	

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Concord Connectivity Analysis Community Input #4

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, we walk, run, mountain bike and road bike for fitness and to compete in triathlons. We have been biking and running less and less as there aren't many safe places to do these activities without driving some distance.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Walking and running somewhat ..... biking no. My husband has been hit once on the road.
What improvements would you like to be made to support walking and biking in Concord?	To make safe greenways by utilizing routes along stream corridors, through open spaces, and along roads.
What areas of the City would you like to see have more bike and pedestrian facilities?	Along George Lyles to Frank Lisk park area. The Phillip Morris area. along 29. To name a few.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Parks and recreation areas, downtown area.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Weddington/George Lyles
Name	Cyndi
Address	
Email	
Phone Number	

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Concord Connectivity Analysis Community Input #5

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I bike for exercise an pleasure, would love the ability to bike vs drive to nearby locations if roads were a bit more bike friendly
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Biking around town is extremely difficult - with distracted drivers and nearly no shoulder I often have to isolate my ventures to longer back routes where I can have road access without impeding traffic too much
What improvements would you like to be made to support walking and biking in Concord?	Bike lanes!
What areas of the City would you like to see have more bike and pedestrian facilities?	Some of the main arteries would be great. Poplar tent Rd, Rt 29
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Concord
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	601 Peigler St NW
Name	Tyler Ludwig
Address	601 Peigler St NW Concord, NC 28027 United States
Email	r3trol0gic@gmail.com
Phone Number	

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Concord Connectivity Analysis Community Input #6

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I go to parks and greenways three to four times per week.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Only in the neighborhood, in parks, and on greenways. Or in downtown Concord.
What improvements would you like to be made to support walking and biking in Concord?	More designated pedestrian walkways or right of ways.
What areas of the City would you like to see have more bike and pedestrian facilities?	If you look on Google Maps or Google Earth, the neighborhoods of Roberta Farms, Cedar Springs, Carolando and Morris Glen practically abut each other, yet one must drive to reach from one to another safely.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	If the natural area described above was available as a natural area for recreational walking, I would use that. I wish that the sidewalk from Publix to almost Hwy 29 had been continued on.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	3220 Roberta Farms Ct Concord 28027
Name	Christine Seitz
Address	3220 Roberta Farms Ct SW Concord, NC 28027 United States
Email	clsseitz@gmail.com
Phone Number	(704) 793-1990

Created 23 Apr 2018 9:59:34 AM	75.190.55.206 IP Address
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Concord Connectivity Analysis Community Input #7

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	We walk our community daily (Christenbury along Cox Mill Rd) but enjoy the greenways on the weekends as a family, esp. the Hector Henry Greenway starting at Odell Primary School.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes
What improvements would you like to be made to support walking and biking in Concord?	
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Living in Christenbury, many pedestrians are trying to get to Christenbury Corners and the new shopping/eating opportunities there. We really need a pedestrain friendly cross-walk where Christenbury Pkwy crosses Derita Rd and becomes Concord Mills Blvd. Very busy intersection and many young adults walk the area and attempt to cross the 4 lanes for food.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Christenbury Pkwy at Cox Mill Rd
Name	Julie Tobin
Address	Concord, NC 28027 United States
Email	
Phone Number	

Created 23 Apr 2018 10:11:55 AM	173.92.9.35 IP Address
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Concord Connectivity Analysis Community Input #8

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.

Walking and biking have not been feasible parts of our family routine in the past. We recently moved from the outlying area near the Charlotte Motor Speedway and now live just on the edge of downtown. I hope to incorporate more walking and biking as we settle into our new neighborhood.

We do enjoying walking our neighborhood block, and maybe this summer we will try to walk to visit Les Myers park, the greenway or downtown. My husband also walks the neighborhood and has biked a few times from our home near Crestside to the Food Lion on Union Street. I haven't been quite brave enough yet to attempt crossing Branchview, but I am grateful for the crosswalks provided there.

We are a homeschool family, so walking and biking have the potential to be a large part of our routine, especially as we do a lot of activities in the downtown area.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel relatively safe as an adult. I have not been brave enough yet to go out with my kids due to traffic concerns. I am grateful for crosswalk lights to assist in crossing from our our neighborhood on Branchview.
What improvements would you like to be made to support walking and biking in Concord?	I think the greenway passages and signs are a great asset. Nothing comes immediately to mind regarding feasible improvements. In an ideal situation I might would suggest pedestrian bridges to help cross some busy intersections, but I realize that is probably cost prohibitive.
What areas of the City would you like to see have more bike and pedestrian facilities?	I used to live out near Frank Liske Park and people in that area have a desire to walk and bike along the busy road, but there are not many accomodations for biker or pedestrian safety in those areas. We now live on the edge of downtown in Winecoff Hills and so that is where my personal priority is for now.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	General downtown area
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Winecoff Hills
Name	Jocelyn Smilie
Address	553 Dogwood St SE Concord, NC 28025-2722 United States
Email	smiliejj@gmail.com
Phone Number	(704) 795-5264

Created 23 Apr 2018 11:00:06 AM	75.88.242.170 IP Address
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Concord Connectivity Analysis Community Input #9

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I try to run on a daily basis. Sometime I'll run to Flowe Park and back. Unfortunately, there is no sidewalk and a very uneven right-of-way in which to run most of the way to the park.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	When I do ride my bike to Flowe Park or Central Cabarrus High School, I'm constantly looking over my shoulder to be certain no cars are behind me. I switch from 1 side of the road to the other to stay out of automobile traffic.
What improvements would you like to be made to support walking and biking in Concord?	It would be a significant improvement to have a sidewalk added to Central Heights Drive. Kids could walk or bike to Central Cabarrus High School. That would save fuel. Families could walk to Flowe Park.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	277 Patrick Ave.
Name	Patrick Perrin
Address	277 Patrick Ave. Concord, NC 28025 United States
Email	robinperrin@netscape.net
Phone Number	(704) 796-0337

Created 23 Apr 2018 11:05:24 AM	24.148.211.10 IP Address
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Concord Connectivity Analysis Community Input #10

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	No. why because there are no sidewalks or bike paths. it's not safe to bike or walk unless i DRIVE to downtown Concord.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	NOT EVEN A LITTLE. there are far too many people walking or biking in the roads now. i'm certainly not going to add to that.
What improvements would you like to be made to support walking and biking in Concord?	SIDEWALKS, SIDEWALKS, SIDEWALKS.
What areas of the City would you like to see have more bike and pedestrian facilities?	EVERYWHERE IN THE CITY.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	the grocery store, restaurants, downtown.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	near Central Cabarrus High School
Name	
Address	
Email	
Phone Number	

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Concord Connectivity Analysis Community Input #11

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. Running and bicycling are everyday methods of exercise in our family. We also bike to close locations for the occasional dinner.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	In some places, such as the greenway in Downtown Concord. But often, no because we have to travel on highly trafficked roads to get to a greenway or safe biking or running streets.
What improvements would you like to be made to support walking and biking in Concord?	Bike Lanes, sidewalks down major thoroughfares that connect neighborhoods/shopping centers/apartments, etc.
What areas of the City would you like to see have more bike and pedestrian facilities?	The area around Poplar Tent, George Liles Pkwy, and Weddington Rd.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Publix, Afton Village, Cannon School, Dorton Park, all neighborhoods on Weddington and George Liles Pkwy, Afton Ridge, Harris Teeter shopping center at corner of George Liles and Poplar Tent, Food Lion shopping center at corner of George Liles and Poplar Tent
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Weddington and George Liles Poplar Tent and George Liles
Name	Heather Bachman
Address	597 Lansfaire Avenue NW Concord, NC 28027 United States
Email	hdbachman@gmail.com
Phone Number	(980) 565-7437

Created 23 Apr 2018 3:19:16 PM	99.203.20.127 IP Address
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Concord Connectivity Analysis Community Input #12

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I would love biking and walking to be part of my routine, but Concord has left many neighborhoods in Western Cabarrus County as their own islands. There is a irrational expectation that more development will fill in the gaps to give paths to the commercial centers.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel safe in my neighborhood for walking but there is not enough side walks connecting the neighborhoods and then even for the actual commercial areas to make it safe.

What improvements would you like to be made to support walking and biking in Concord?

The city should automatically fill in and budget sidewalk gaps of 1 mile or less between neighborhoods, commercial centers and schools. 1 frustrating example: Highland Creek and Christenbury. Both are disconnected by a little bit of side walk on a commercial property that is trying to be sold and built at Cox Mill and Christenbury Pkwy. In addition, Both are not connected to Christenbury Corners/Crossing (and then further to Concord Mills). Perfect opportunity to have families ride bikes or just walk to the commercial center for dinner, grab some groceries or a treat. And finally, they are not connected to Cox Mill Elementary and High Schools at about a mile away. There are neighborhoods being built in between currently. It would be beneficial for the city to fill in the gaps are private land or nature preserve... All of this includes whatever working partnerships are needed (i.e. with the county and state). It is land and a gap.... the jurisdiction does NOT matter to those that could use it. Also, it does NOT need to be sidewalks... it can look more like greenway paths (i.e. what Hilton Head does).

Another example, You are bordering with Kannapolis at Afton Village. One side of I-85 has Afton Village and the other has a cool shopping center with lots of options. HOWEVER, you must cross over I-85 on George Lyles Blvd to go between them. Last I checked there was no pedestrian access over that bridge. An alternative for this would be a trail going from Afton Village through Dorton Park under I-85 and back up and over to the shopping center and ensuring there is a path for pedestrians in the shopping center on that side.

What areas of the City would you like to see have more bike and pedestrian facilities?

The following streets should have it added for pedestrian
Christenbury Pkwy
Cox Mill Rd
Concord Mills Blvd (fill in the sidewalk everywhere as the businesses are not going to do it since they are already built)
Derita
Poplar Tent (all the way to the city center and out to Cannon Crossing at least)
Cannon Blvd
Eastfield / Harris Rd (several large neighborhoods disconnected)
George Lyles Pkwy (important for connecting both sides of the interstate)
Concord Mills / Bruton Smith Blvd... would be useful for pedestrian / bike routes to be accelerated. give guests in the hotels and Great Wolf Lodge an alternative to driving to Concord Mills, Kings Grant or Christenbury Corners.... and vice versa. This could be partially just accelerating the Rocky River Greenway (that you like to call Henry Hector III Greenway) and ensuring good road connections to it and signage directing to it exists.

What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Christenbury Corners/Crossing / Concord Mills / Bruton Smith Edison Square Cannon Crossing Afton Village / Ridge
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	

Name	Mark Waldrop
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Phone Number	(980) 254-1386

Created 23 Apr 2018 7:07:57 PM	173.92.8.251 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #13

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Sometimes. We have the ability to walk from our house to downtown via the greenway, which is spectacular, and something we do on weekends.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Walking, definitely. I am not currently a biker, but I would not feel safe biking in many parts of Concord.
What improvements would you like to be made to support walking and biking in Concord?	Greenway expansion and dedicated bike facilities.
What areas of the City would you like to see have more bike and pedestrian facilities?	Selfishly, along Coldwater Creek. Less selfishly along Irish Buffalo Creek between McGill and Cabarrus Ave. Improvements parallel to Concord Parkway and Poplar Tent would be interesting. Church Street also seems prime for improvements.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I suppose Copperfield Blvd. and Carolina Mall would be the next accessible area with greenway improvements along Branchview.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Branchview@Corban
Name	
Address	
Email	
Phone Number	

Created 24 Apr 2018 7:39:09 AM	166.82.104.11 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #14

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk at least 4-5 times a week. I live in a great neighborhood to walk, but also like to frequent the greenway and other walking trails in Cabarrus County.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I walk during the day and feel quite safe. I wouldn't walk the greenway at night... just my opinion.
What improvements would you like to be made to support walking and biking in Concord?	I REALLY wish that the greenways would safely connect people to more commercial, functional destinations. This is also accomplished with more sidewalks. People need safe walking/biking access to stores, restaurants and other businesses. When they added the new extension to the greenway, WHY?? didn't they add a pedestrian tunnel to go under Branchview at Cabarrus Avenue????? That way, people wanting to safely get to Food Lion/CVS/etc could do so. Such a disappointment.
What areas of the City would you like to see have more bike and pedestrian facilities?	People need to be able to safely access real life destinations when biking/walking. The apartment complexes along Lake Concord Rd should be able to safely get to the entire Walmart shopping complex. I've seen too many people pushing strollers along the side of the road! The list could go on and on and on.....
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Schools. Downtown. The hospital. My friends' houses. Food Lion. YOU name it!!!
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	656 Abington Dr NE
Name	Lynn Takla
Address	656 Abington Dr NE Concord, NC 28025 United States
Email	ltakla@carolina.rr.com
Phone Number	(704) 785-8303

Created 24 Apr 2018 8:27:17 AM	69.132.63.152 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #15

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, I love to ride my bike on a smooth surface. Taking my bike over to the trail off of Branchview is one of my favorite things to do. I wish it was closer to my house.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I don't feel safe when I try to walk or ride my bike to WW Flowe Park. This is very close to my house. I would go to the park more often if I did not fear getting hit by a car.
What improvements would you like to be made to support walking and biking in Concord?	I would like to see sidewalks installed on Central Heights. We have WW Flowe Park and Central Cabarrus High School. It would be nice to see some side walks on HWY 49 too.
What areas of the City would you like to see have more bike and pedestrian facilities?	Central Heights, Zion Church Road, HWY 49
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Flowe Park & Central Cabarrus High School
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Robin Perrin
Address	277 Patrick Ave Concord, NC 28025 United States
Email	robinperrin@netscape.net
Phone Number	

Created 24 Apr 2018 8:38:12 AM	24.148.211.10 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #16

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, I try to do this at least 3 times a week, normally in my neighborhood, but I will go to Dorton or Frank liske too
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I do - I do most of my walking alone at times frank liske gets a little unnerving when you are walking the long trail in the wooded area. I feel very safe in my neighborhood - although I wish we had sidewalks
What improvements would you like to be made to support walking and biking in Concord?	more sidewalks in neighborhoods- possibly some lights within the park wooded areas
What areas of the City would you like to see have more bike and pedestrian facilities?	North west side
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Spring Hill Subdivision
Name	
Address	
Email	
Phone Number	

Created 24 Apr 2018 10:56:07 AM	152.43.52.125 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #17

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes and I would love to do more. Highland Creek neighborhood is a good place for it but connecting the Concord/Cabarrus sideof it to other trails would greatly improve it.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Within the neighborhood yes but it lacks infrastructure to connect safely to other areas (for example concord mills, greenways...).
What improvements would you like to be made to support walking and biking in Concord?	More connectivity
What areas of the City would you like to see have more bike and pedestrian facilities?	Around Highland Creek neighborhood, Concord Mills Blvd...
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	See above
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Olivier Henry
Address	9840 Nicole lane Charlotte , NC 28269 United States
Email	olivier.henry@gmail.com
Phone Number	

Created 24 Apr 2018 6:44:04 PM	172.73.150.192 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #18

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.

I like to run and bike for exercise and as a family activity. I cycle on the roads in Cabarrus & Stanly county about 40 miles a week or on a designated mountain bike trails about 20 miles a week (3-4 hours a week split). I'm generally driving half an hour or more each way to reach a MTB trail.
I also walk and bike with my family about once a week. Typically family outings start from our house and go around the McEachern Greenway downtown. I also run the greenway myself at least once a week, as does my wife.
We sometimes ride bikes from our house about a mile up the sidewalks on S. Union to downtown shops/restaurants. My 10 year old son frequently bikes to the Concord Library on his own, and to school.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.

With some reservations, yes.

My wife and a friend had an experience on the greenway where a person was acting strange and carrying a toy gun that appeared to be real. They are concerned about situations like that.

My experience as a road cyclist is not great. Approaching the Union St. / Corban intersection from the south on union is one trouble spot in particular where the road markings are not adequate to keep drivers from being confused about which lane to take and what cyclists are doing.

The bike lanes on Church street are in terrible shape and have many dangerous obstacles for cyclists in them. There are a few bad potholes (one in particular near brookwood ave.), sewer grates (northbound near Auto Bell) that force cyclists out into the road, and where the lane ends as it approaches Buffalo/Church is confusing to drivers. My biggest complaint is the dirt and gravel. The bike lane is not kept clean enough. If we add bike lanes, will it get worse?

What improvements would you like to be made to support walking and biking in Concord?

I'd like to see a few things:
1) recreational mountain bike trails and also park facilities like pump tracks or BMX skateparks. I've traveled to a number of other cities which have excellent resources and wish we had them too. Harrisonburg VA where my sister lives does a fabulous job and there are many examples nationwide.
2) more support for bikeability, esp. to and from downtown. This is lanes, routes, racks, etc.
3) Better management and maintenance of the street-side bike lanes we currently have. Maybe address some of the concerns about merging into and out of traffic.

For walking:
1) Unpaved hiking/walking trail for more of an outdoor experience. Easy hike destinations for our cub scout pack all involve driving out of town at least 15 minutes.

What areas of the City would you like to see have more bike and pedestrian facilities?	You make it, I'll ride it.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would like anyone within a few miles of a school to be able to bike there. We can bike to R. Brown but probably could not bike to Concord Middle. I'd be delighted with an improved pedestrian/bike crossing of the tracks across McGill to be able to bike to the businesses at Gibson Mill.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Hillcrest & Sunset Dr SE

Name	Barrett Lawson
Address	346 Sunset Dr SE Concord, NC 28025 United States
Email	barrett@rblawson.com
Phone Number	(919) 610-9266

Created 25 Apr 2018 9:57:39 AM	74.219.14.2 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #19

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Biking 3-4 times a week. I do some group rides but ride solo a good bit too. I'd love to see a 5 ft dedicated bike lane installed on a route.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No, I stopped riding a lot of roads because I didn't want to get hit and killed.
What improvements would you like to be made to support walking and biking in Concord?	Add dedicated shoulder or bike lane on a designated route that is at least 10+ miles one way.
What areas of the City would you like to see have more bike and pedestrian facilities?	Highway 73 is very scary to ride on. If you are west of I85 and want to get into concord, the route isn't safe.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Downtown and through concord to the country roads. Would love to see a greenway connect from downtown to university area and connect to Clarks creek greenway.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Highway 73 and Odell school road.
Name	Brad Henry
Address	722 Odell School Road Charlotte, NC 28027
Email	bradhenrysemail@gmail.com
Phone Number	(980) 253-3390

Created 25 Apr 2018 8:26:15 PM	65.184.65.20 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #20

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. Live in downtown and ride 100+ miles a week for fitness, wish includes hosting rides from The Right Gear.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No. Too much traffic.
What improvements would you like to be made to support walking and biking in Concord?	Church Street bike lane is a mess as one example with potholes, etc. That entire street needs to be repaved. But again, that's just one example. Need more bike lanes of course.
What areas of the City would you like to see have more bike and pedestrian facilities?	With-in the city limits.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Afton Village perhaps.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	2821 Crisman St
Name	Tim Sigmon
Address	71 Edgewood Ave NE Concord, North Carolina 28025 United States
Email	timbsigmon@gmail.com
Phone Number	(980) 721-2579

Created 26 Apr 2018 1:52:15 AM	172.72.83.136 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #21

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I'm a regular cyclist. I wish it was safer to ride my bike out of my community.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel safe walking because of the streets I use. When I ride my bike, I don't feel safe unless I drive downtown and ride it there.
What improvements would you like to be made to support walking and biking in Concord?	More sidewalks and bike lanes, obviously. Start with hwy. 73 between 29 and 85 please.
What areas of the City would you like to see have more bike and pedestrian facilities?	The Northwest section in general, highway 73 in particular.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Downtown would be my first destination. If there was a greenway to downtown Kannapolis or Concord Mills, I would ride to them.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Zemosa Acres
Name	Ben Ellington
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Email	ben@benellington.com
Phone Number	(704) 788-8535

Created 26 Apr 2018 3:35:04 AM	40.142.142.31 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #22

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I ride my bike as my primary means of exercise. Four times a week.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Sometimes. When using a bike lane I feel safe, but bike lanes are not common. And bike lanes can sometimes get filled up with debris which forces me to move back and forth between the the car lane & bike lane.
What improvements would you like to be made to support walking and biking in Concord?	I'd love to have bike lanes in each of our heavily populated roads.
What areas of the City would you like to see have more bike and pedestrian facilities?	Bike lanes added to: Roberta Rd Old Charlotte Rd SW Pitts School Rd SW Pitts School Rd NW Popler Tent Rd McGill Ave NW WeddingTon Rd NW Wilshire Ave
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Roberta Rd & Blackwelder Rd
Name	Jeremy Polley
Address	Concord, NC 28027 United States
Email	jeremypolley@gmail.com
Phone Number	

Created 26 Apr 2018 3:51:11 AM	173.92.194.134 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #23

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Since I cannot run anymore, outdoor bicycling is the only physical exercise I enjoy and do.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No. With speeding drivers on their cell phones drifting into road shoulders, or roads with no paved shoulders at all, road biking is EXTREMELY dangerous activity.
What improvements would you like to be made to support walking and biking in Concord?	A fully developed bike trail system, separate from the sides of roads would be a dream. If this is too much logistically, then a few places where people can get away to walk or ride on trails. Parking for these is a primary planning concern.
What areas of the City would you like to see have more bike and pedestrian facilities?	Along Harris / Eastfield Rd. between Poplar Tent and Prosperity Church Rd.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would bike from the corner of Ellenwood Rd. and Harris Rd. to Prosperity Church Rd. if there was a safe way to do so.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	the corner of Ellenwood Rd. and Harris Rd. (Edison Square; at the corners of Skybrook and Winding Walk housing developments).
Name	Brian Bernett
Address	10636 Rippling Stream Dr Concord, North Carolina 28027
Email	bbernett@gmail.com
Phone Number	(808) 265-6472

Created 26 Apr 2018 4:22:50 AM	75.190.107.129 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #24

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Weekend activities, yes. Kids ride their bikes on the greenway.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes. The greenway is great.
What improvements would you like to be made to support walking and biking in Concord?	More greenways.
What areas of the City would you like to see have more bike and pedestrian facilities?	I wish the greenway along Branchview, would reach all the way to the mall/hospital.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I wish the greenway along Branchview, would reach all the way to the mall/hospital.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Carolina Mall
Name	
Address	
Email	
Phone Number	

Created 26 Apr 2018 6:02:34 AM	166.82.104.11 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #25

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	No
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	
What improvements would you like to be made to support walking and biking in Concord?	areas where it would not impede road traffic. I would oppose any changes to reduce travel lanes to allow bike lanes (as has been done in certain areas of Charlotte). Widening roads to allow bike lanes is fine but taking a lane from vehicle traffic to make a bike lane is stupid.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	none
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	hwy 49 & zion ch rd
Name	
Address	
Email	
Phone Number	

Created 26 Apr 2018 6:11:05 AM	24.206.51.158 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #26

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.

I wish that walking or biking could be part of my routine!! I can easily do so just within my neighborhood, but the traffic/road situation is too dangerous to walk/bike the short distance from my neighborhood to anywhere else (like to the grocery store or park). I live in Carriage Downs neighborhood, and if we could be connected by bike path or sidewalk to businesss/Dorton Park down Poplar Tent and/or Weddington Roads, it would make a huge difference. If we want to walk on the greenway along George Liles, we have to drive there and park before we can walk. There are several neighborhoods within close proximity of that greenway, but none of them have pedestrian/bike access to get there.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	See above comment
What improvements would you like to be made to support walking and biking in Concord?	Sidewalks/bike lanes to connect neighborhoods to business areas. We should be able to walk/bike from home- not have to drive to a location toting a bike on the car before beginning to walk/bike. Its too complicated and so we don't use the greenway areas as much as we could.
What areas of the City would you like to see have more bike and pedestrian facilities?	Weddington/Poplar Tent area- connecting neighborhoods (Carriage Downs, King Crossing, laurel lark, Sheffield Manor, Woodlands, etc.) to parks and businesses in close proximity (such as Dorton park, Afton Village, George Liles greenway path, HT and Publix shopping centers, etc.)
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	see above
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	5777 Windward Court NW
Name	Julie Connelly
Address	5777 Windward Court NW Concord, NC 28027 United States
Email	jconnelly101@gmail.com
Phone Number	(980) 621-1743

Created 26 Apr 2018 6:18:32 AM	173.92.37.66 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #27

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.

Yes
My husband and I are avid cyclists but we are having to drive to safer points to start our 30- 50 mile rides. We would love to see bike lanes for safer cycling. The local bike club - Central Carolina Cycling club (C4) would also be a good source of input and I'm sure they would endorse bike lanes. I take spinning classes at the Y and in discussion with other participants they express that they would live to ride bikes outdoors but are afraid of the traffic

We also do some running and walking in Dorton park since we live in Afton village and enjoy this very much. I was glad to see the access light across Poplar tent road by Cabbarrus charter school. A pedestrian light across George lilies from the Quik trip to Grand Canyon rd would be great.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Poplar tent rd is almost impossible to ride on. We cut through Laurel park, are briefly on poplar tent rd then ride on Eva drive to get over to McGill and to union st We have had multiple negative interactions with cars and have friends who have been hit by cars while cycling.
What improvements would you like to be made to support walking and biking in Concord?	Bike lanes and sidewalks
What areas of the City would you like to see have more bike and pedestrian facilities?	Western Concord
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	From western Concord to central Concord and out towards Mt Pleasant
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Dolores Coughlin
Address	5643 Fetzer Ave Concord, NC 28027 United States
Email	dolorescoughlin@yahoo.com
Phone Number	(704) 305-3572

Created 26 Apr 2018 6:33:00 AM	173.92.47.2 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #28

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Not as much as I'd like. We frequently take the kids to the parks, but rarely use the greenway anymore.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I don't bike at all because I don't feel there are safe, easily accessible bike trails.
What improvements would you like to be made to support walking and biking in Concord?	I would love to see a long bike trail like other cities have. If we currently have one, I'm unaware of it!
What areas of the City would you like to see have more bike and pedestrian facilities?	Downtown is where I'm located, so that's where I'd like to see bike trails.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Claymont street.
Name	
Address	
Email	
Phone Number	

Created 26 Apr 2018 6:39:44 AM	65.184.30.86 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #29

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk every day as much as possible
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	For the most part
What improvements would you like to be made to support walking and biking in Concord?	More police on bikes presence
What areas of the City would you like to see have more bike and pedestrian facilities?	Old Salisbury-Concord Rd from Branchview to Lane St
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I'd use the one mentioned above to get to downtown Concord
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Suther/Moonstone
Name	Stacey Howard
Address	
Email	stacey.howard@live.com
Phone Number	

Created 26 Apr 2018 6:40:25 AM	72.15.255.84 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #30

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Walking is a party of my routine. I live in the rural area of Concord so I normally walk along less traveled side roads or at area parks.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	When using the trails at the local parks if others are around I do feel safe. I will say it can be uncomfortable if walking alone and the parks don't have many visitors.
What improvements would you like to be made to support walking and biking in Concord?	I would love to see a Greenway that connects many areas within Concord.
What areas of the City would you like to see have more bike and pedestrian facilities?	George Liles and around area schools.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Neighborhoods that can connect to schools, neighborhoods that can connect to parks and areas leading to restaurants, shopping.....downtown, Afton and mall areas.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	The closest major intersection is Hwy 49 and Blackwelder Road
Name	Jennifer Hilll
Address	6340 Homestead Place Concord, NC 28025 United States
Email	fournthefamily@aol.com
Phone Number	(704) 791-2185

Created 26 Apr 2018 6:40:29 AM	71.31.67.182 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #31

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I love walking and wish there would be more greenways or hiking/biking trail all around Concord. We often go Dorton Park and Frank Liskes Park.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Most if the time it feels safe. I am worried about people who might carry a weapon though.
What improvements would you like to be made to support walking and biking in Concord?	Sidewalk or trail to go to Dorton park from Cannon School, Kings crossing, Carriage Down neighborhoods and possibly connecting to new Greenway so we don't have to drive and park.
What areas of the City would you like to see have more bike and pedestrian facilities?	See previous andwer
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Kings Crossing drive and Poplar Tent Rd
Name	
Address	
Email	
Phone Number	

Created 26 Apr 2018 6:53:27 AM	24.225.35.21 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #32

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I do both just for exercise and fun.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes mostly . Would be nice to have a bike lane on Union to connect to downtown.
What improvements would you like to be made to support walking and biking in Concord?	Would be nice to have a bike lane on Union to connect to downtown.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Union street
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Donna Moser
Address	189 Marshdale Ave Concord, NC 28025 United States
Email	dfmoser@windstream.net
Phone Number	(704) 791-0726

Created 26 Apr 2018 6:56:12 AM	152.26.197.40 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #33

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I run/walk or bike several times a week.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Biking in Concord can be scary. There are not a lot of bike lanes and those that do exist have trash in them or holes and uneven pavement. We generally have to drive out to the country to ride our bikes. I only walk in areas that have a sidewalk.
What improvements would you like to be made to support walking and biking in Concord?	More bike lanes please! And signs that inform motorists that IT IS THE LAW to keep 4 feet between your car and a bike. Keep the bike lanes maintained and clean and clear of trash/debris.
What areas of the City would you like to see have more bike and pedestrian facilities?	There is no safe way to walk/ride east/west across Concord. North/South along Union St and down Church St to the hospital area is about the only route that has bike lanes and/or sidewalks
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	From downtown to Southwest Concord or Northwest Concord.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	I live in the Hillcrest/Eastover neighborhood.
Name	Elizabeth Simpson
Address	199 Ravine Circle, SE Concord, NC 28025 United States
Email	esimpson1983@yahoo.com
Phone Number	(704) 786-9208

Created 26 Apr 2018 6:57:03 AM	208.82.1.242 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #34

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. Walking dog and biking with my family within my neighborhood. My family walks and bikes in Concord but because my community is not linked to any other community- we have to load bikes and travel in the city to bike paths and greenways.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No. Walking and biking is only safe in some Concord areas. The city planning commission must require new contractors to install sidewalks to ensure safety and to connect communities. The City of Concord does not do enough to promote and require the install of sidewalks. Example. A person living Carolando neighborhood is trapped in their community as no sidewalk leads out of neighborhood and links with other neighborhoods. This community connects to Pitt School Road, a state road with a high speed limit and no sidewalks.
What improvements would you like to be made to support walking and biking in Concord?	Connect communities with sidewalks. There are many grants that can support this along with the city's support. We need sidewalks, not greenways that are built for tourist/hotel use that do not connect neighborhoods.
What areas of the City would you like to see have more bike and pedestrian facilities?	There are no city parks or city greenways that link communities in the Pitt School Rd corridor. This area needs to connect with the county park- Frank Lisk or the Hector Greenway.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	SW Concord. There are no connections for the hundreds of homes in the Pitt School area. We need to work with local landfill (land owner) or city to get sidewalks to connect high school to elementary school and thus connect neighborhoods in between.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	.
Name	Charles Copeland
Address	4119 Wrangler Drive SW Concord, NC 28027 United States
Email	ccopeland99@yahoo.com
Phone Number	(704) 968-4042

Created 26 Apr 2018 7:00:25 AM	152.26.180.31 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #35

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I walk in my neighborhood daily. I ride bikes with my granddaughter and we would really enjoy more areas to ride safely without considering car traffic. The green ways are wonderful!
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes, I do not feel threatened except for car traffic when riding bikes on the streets.
What improvements would you like to be made to support walking and biking in Concord?	Improvements to the sidewalks are already evident. Lighting would encourage more evening walking/riding.
What areas of the City would you like to see have more bike and pedestrian facilities?	Unsure of any.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Downtown and all parks and recreation facilities.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Wendy Irvin
Address	610 HERMITAGE DR SE Concord, NC 28025 United States
Email	wbi156@gmail.com
Phone Number	(704) 783-6232

Created 26 Apr 2018 7:08:43 AM	40.142.151.134 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #36

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. My family likes to go on bike rides and run together on weekends.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel safer biking and walking through our neighborhood trails or park trails.
What improvements would you like to be made to support walking and biking in Concord?	More greenway trails that connect up to neighborhood trails and park trails for a continuous trail loop.
What areas of the City would you like to see have more bike and pedestrian facilities?	Around the Concord Mills and Christenbury Parkway area. There are a lot of homes/residences very close to retail in that area. Due to that there is some traffic and congestion at times. If there were more sidewalks and bike and pedestrian friendly options there, that would alleviate some of that traffic because the retail is certainly close enough for many people who live around there to walk or bike to, but they don't because there aren't any connected sidewalks and paths to do so.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Around the Concord Mills and Christenbury Parkway area. I live in Christenbury and would love to be able to safely walk to shops and restaurants near the Earthfare and Lidl.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	intersection of Cox Mill Rd and Christenbury Parkway
Name	
Address	
Email	bettyhuynh3@gmail.com
Phone Number	

Created 26 Apr 2018 7:13:01 AM	204.148.30.246 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #37

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk at least every other day. I like to walk in my neighborhood but also in parks such as Frank Liske. I used to bike more, but I feel the roads are too crowded for safe biking now.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel safe walking in my neighborhood and on trails in parks. I do not feel safe biking on our roads because they are too crowded and drivers don't know how to treat cyclists.
What improvements would you like to be made to support walking and biking in Concord?	More bike lanes would be awesome! I love the greenway and am glad to see it expanded.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would bike to downtown Concord from the western suburbs.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	
Address	George Liles and Poplar Tent
Email	
Phone Number	

Created 26 Apr 2018 7:19:46 AM	173.92.192.86 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #38

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I schedule myself to walk 5 miles daily. I have had great success thus far this year, side lined only by a sore knee for a short period of time
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel very safe
What improvements would you like to be made to support walking and biking in Concord?	not sure since I have not had any problem
What areas of the City would you like to see have more bike and pedestrian facilities?	not sure
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	not sure
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Poplar Tent Road
Name	Garry Stevenson
Address	1419 Fawn Ridge Road NW Concord, NC 28027 United States
Email	gmstevenson@carolina.rr.com
Phone Number	(704) 652-2038

Created 26 Apr 2018 7:20:28 AM	98.24.174.143 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #39

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, run 3 times per week. Would like to have greenways connected for safer walking and biking riding with my children.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	For the most part yes.
What improvements would you like to be made to support walking and biking in Concord?	Greenway expansion has been focused on downtown area which already has walkable streets and sidewallks. More is needed in surrounding residential areas.
What areas of the City would you like to see have more bike and pedestrian facilities?	Poplar Tent between I-85 and Afton Village
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Derita and Poplar Tent
Name	
Address	
Email	
Phone Number	

Created 26 Apr 2018 7:24:18 AM	70.63.162.242 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #40

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	yes - I walk my neighborhood
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	In my neighborhood I feel safe. Haven't spent much time in other areas of Concord walking
What improvements would you like to be made to support walking and biking in Concord?	smoother sidewalks/streets
What areas of the City would you like to see have more bike and pedestrian facilities?	unknown
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	none
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	
Address	
Email	
Phone Number	

Created 26 Apr 2018 7:25:18 AM	208.82.1.242 IP Address
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Concord Connectivity Analysis Community Input #41

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I bike on the roads twice a week throughout the year and run once or twice a week throughout the year.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes for walking, not so much for cycling. Some roads have no shoulder or are too narrow and it is scary to ride on those. Cars do not have much respect for cyclists. I would love to have my kids bike more but I don't want them out on the roads outside of our neighborhood yet.
What improvements would you like to be made to support walking and biking in Concord?	More infrastructure for cycling: bike lanes (that are cleaned regularly) on roads as well as a path to get there from the street, side paths, etc. Better signage for cycling and/or creation of bike friendly routes. For walking, more sidewalks along main roads (George Liles, Poplar Tent, etc).
What areas of the City would you like to see have more bike and pedestrian facilities?	The main roads to get across town: Hwy 73/Davidson Hwy, Poplar Tent Rd, Weddington Rd, also Pitts School Rd. Thank you for the multi-use path on George Liles! Now it just needs to connect to the northern sections.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would let my 10 yr old child walk to school if there were sidewalks on Poplar Tent Rd. We live in Afton Village and LOVE walking to restaurants, ice cream shop, QT, YMCA, and Dorton Park. I wish there was a library that my kids could walk/bike to.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Poplar Tent & George Liles - Afton Village neighborhood
Name	Irene Sacks
Address	6107 Village Dr NW Concord, NC 28027 United States
Email	irenesacks@gmail.com
Phone Number	(704) 791-7990

Created 26 Apr 2018 7:33:46 AM	204.84.167.66 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #42

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Both are important to me. I Bicycle about 4000 miles last year and would love to do more of it in Concord.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No, what few bike lanes we have are full of trash, from storms, broken glass, liter and are unsafe to operate a bicycle on. When you ride outside the bike lanes, you put yourself in danger of being hit by an automobile. Concord does not have a tolerance for bicycle riders in the roadways.
What improvements would you like to be made to support walking and biking in Concord?	Clean bike lanes, more bike lanes, barriers to make cyclists safer from autos. Parkways connected to other cities parkways. A campaign to promote safer cycling in town.
What areas of the City would you like to see have more bike and pedestrian facilities?	All over
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Anywhere
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Hillcrest and South Union
Name	Bob Simpson
Address	199 Ravine Circle SE Concord, NC 28025 United States
Email	bobsimpson28@gmail.com
Phone Number	(704) 786-9208

Created 26 Apr 2018 7:39:26 AM	24.74.186.145 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #43

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I run and cycling regularly, as part of maintaining my diabetes. I use the greenway when I can. However, I mostly use roads, as my cycling routine is mostly made up of 35-70 mile rides, 4 times a week. With an occasional long ride (100+ miles).
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Not really. The traffic can be heavy, and there are few bike lanes or shoulders. Forcing me to use the same lane as vehicle traffic.
What improvements would you like to be made to support walking and biking in Concord?	Public education and police enforcement about what to do, when approaching and passing a cyclist. State law requires that passing vehicles are to give cyclist the lane; as if they were passing another car. This rarely happens. I know several cyclist that have been run/bumped off the road by passing cars. In light of the resent cycling fatality in Charlotte, I feel it's time local government takes this seriously.
What areas of the City would you like to see have more bike and pedestrian facilities?	All of the city, of course. In particular, there seems to be no way to cross the i85 corridor; without riding in heavy traffic lanes.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I85 corridor. Mall and surrounding area.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	I currently reside in Kannapolis, and ride into Concord several times a week.
Name	Jason Thomas
Address	
Email	kjasonthomas@icloud.com
Phone Number	

Created 26 Apr 2018 8:01:52 AM	172.73.39.124 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #44

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. Live downtown and enjoy the greenway and walking to shops downtown.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Very safe. Union is well lit. Well patrolled. Officers take a good approach to our homeless, respecting them but not tolerating panhandling or unseeming behavior Most roads are wide enough for bikes. And sidewalks are in good shape.
What improvements would you like to be made to support walking and biking in Concord?	Stick with your long range plan with the Carolina Thread Trail. Think also about how you engage residents to use what we have. Lots of great activities like Boot Camp in the Park and fun runs should be leveraged with the bike/walk network of trails and roads to promote healthy living.
What areas of the City would you like to see have more bike and pedestrian facilities?	Content with the parks and trails close to central downtown.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	The Carolina mall area remains anti bike anti pedestrian. Was so even before the road construction. Is a poor introduction to Concord for visitors.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Marc Reid
Address	165 Union St S Concord, NC 28025 United States
Email	reidme100@gmail.com
Phone Number	(704) 806-6272

Created 26 Apr 2018 8:29:42 AM	24.74.185.59 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #45

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I usually use the greenways to run as well as take my children bike riding
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes. I have not had any experiences where I felt unsafe going along the grenenways
What improvements would you like to be made to support walking and biking in Concord?	There are some routes along the greenway where one can easily get misguided to staying on the set greenway path. It would help to make greenway markets more visible or noticeable.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Danielle Irving
Address	89 Tarrymore ln Concord , Nc 28027 United States
Email	hurtdn.dh@gmail.com
Phone Number	

Created 26 Apr 2018 8:31:44 AM	69.132.133.1 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #46

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I run several times a week along Union Street as well as the downtown Greenway. I live right off Union and walking, biking and running the Greenway is a vital part of our family's weekly activities. Rain or shine, all year long.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.

I do feel safe and run during the pre dawn hours very often along Union and the Greenway. However my wife does not feel safe to run the Greenway during the early hours alone.

Example: My wife was running along the Greenway during the middle of the day on a weekend, and was passed by a teenagaer carrying and posturing with a modified "airsoft" toy gun, that was made to resemble an actual hand gun. Police were notified and the teenager was dealt with.

Additionally the newly opened Greenway extension is great, however is quite secluded from other areas. Not the safest feeling being alone out there. Will it be connecting with other areas? Are there plans to add a new park or picnic areas in order to make the extension more welcoming?

What improvements would you like to be made to support walking and biking in Concord?	• Increased police bike-patrols along Union Street and the Greenway. • I can't believe I have to say this but "Pedestrian Walk/Don't Walk Signals" for downtown. Including audible tones and vibrotactile surfaces. (We are literally decades behind in this. It's embarrassing) • Addition of Bike lanes on North and South Union street and improvements to signage and symbols for lanes already in existence.
What areas of the City would you like to see have more bike and pedestrian facilities?	A more connected Greenway system would benefit the city as a whole. Downtown to Gibson Mill would make a lot of sense. And while I selfishly want my tax dollars spent in the downtown area, I'm pretty sure anyone staying at hotels near Concord Mills is forced to drive just for breakfast or coffee.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Gibson Mill from downtown.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	85 Washington Ln SE
Name	Brad Stephens
Address	85 Washington Ln SE Concord, North Carolina 28025 United States
Email	brad@iambrad.com
Phone Number	(336) 508-5864

Created 26 Apr 2018 8:37:31 AM	168.244.5.54 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #47

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I ride bikes or run at least 6 days a week. I mostly mountain bike because the roads are so dangerous and narrow for riding.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	See above. I've been hit and left for dead on some rural roads in the area. Bigger shoulders that actually get cleaned off would be helpful. So much debris on them that they're a haven for flat tires.
What improvements would you like to be made to support walking and biking in Concord?	More greenways that actually connect things together. The downtown one is the only one that's not just a path to nowhere. Connect neighborhoods together, and connect them with shopping, dining, etc. Make it so people can do those things without a car and feel safe doing so.
What areas of the City would you like to see have more bike and pedestrian facilities?	Everything west of of 29N
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would ride from the Weddington Rd area to downtown for work everyday if there was a safe way to do it. Poplar Tent and Weddington Rd are not ideal.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Hansom Ln and Weddington Rd
Name	
Address	
Email	
Phone Number	

Created 26 Apr 2018 8:57:37 AM	166.82.104.11 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #48

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, my family and I enjoy getting outside and walking downtown for dinner and just getting exercise in general
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel safe walking but not so much biking. In order to access the greenway we have to travel on many streets that do not have bike lanes and so many drivers are not aware of bikers
What improvements would you like to be made to support walking and biking in Concord?	More biking lanes
What areas of the City would you like to see have more bike and pedestrian facilities?	Id love to see paths from downtown out to the hospital and mall, it would be fun to ride our bikes to the movies and get dinner at one of the surrounding restaurants. Even to the grocery stores in the area. It would be great to be able to ride our bikes to the market to get some things instead of firing up the huge suburban to go 2 miles
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	this is all from our perspective in the historic district... Harris Teeter Carolina mall the movies at the mall the hospital down Cabarrus avenue to the branch view area around foodlion down branch view
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	grove and Georgia
Name	Nicki BRYANT
Address	113 Grove Ave. NW Concord, NC 28025 United States
Email	nickidbryant@aol.com
Phone Number	(704) 906-7242

Created 26 Apr 2018 9:01:32 AM	24.74.178.141 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #49

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	We use the greenway at least 4-5 times a month. That number will certainly increase during the summer.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes.
What improvements would you like to be made to support walking and biking in Concord?	None at this time.
What areas of the City would you like to see have more bike and pedestrian facilities?	I would like to see the greenway expanded from Myers Park to the end of Branchview/Union St. intersection.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	None at this time.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Union St/McArthur Ave. SE
Name	Matt Krome
Address	
Email	mattkrome@yahoo.com
Phone Number	

Created 26 Apr 2018 9:28:42 AM	152.26.35.108 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #50

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk my dogs daily in my neighborhood but it is difficult as there are no sidewalks or access to green space.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I do not always feel safe walking or biking in Concord. There are no sidewalks in my area, and no access to a bike path(without loading up the bikes and driving) When I try to ride my bike on the road I am often beeped at by cars and have almost been hit by several cars.
What improvements would you like to be made to support walking and biking in Concord?	I would like to see interconnected trails for walking and biking that take you to the neighborhoods of Concord. I think it would be more feasible if you could walk or bike to places without being in the street.
What areas of the City would you like to see have more bike and pedestrian facilities?	I live off Church street by Branchview Ave. It seems there is a nice place for a trail on Branchview Ave that could run from the Hospital to Union Street.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would love to see a connection for the Carolina Mall/Hospital area and downtown Concord
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	121 Carolina Ave NE Concord NC 28025
Name	Sarah Gross
Address	121 Carolina Ave. NE Concord, North Carolina 28025 United States
Email	gsarah94@hotmail.com
Phone Number	(541) 880-8221

Created 26 Apr 2018 9:57:58 AM	24.199.134.154 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #51

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	My wife and I walk with our 20 month old son and dog every chance we get (weather permitting.)
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No. Downtown has no pedestrian signals!! In general, sidewalks are lacking. Corbin Ave has no sidewalk to access Mickey Jr. Park
What improvements would you like to be made to support walking and biking in Concord?	More sidewalks and pedestrian signals - especially in downtown!
What areas of the City would you like to see have more bike and pedestrian facilities?	Branchview Drive, Carolina Mall
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Carolina Mall. Downtown Concord.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	David Conrad
Address	806 Oak Embers Dr SE Concord , NC 28025 United States
Email	dvdjcnrd@yahoo.com
Phone Number	

Created 26 Apr 2018 10:18:51 AM	12.195.24.4 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #52

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, I run nearly every day.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I do not go to Dorton Park alone past 6pm. Just to be cautious.
What improvements would you like to be made to support walking and biking in Concord?	There could certainly be more lights installed at Dorton Park. Downtown Concord is also great for running and walking, but many of the sidewalks are in disrepair.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	George W Liles, Poplar Tent
Name	Allison M
Address	
Email	
Phone Number	

Created 26 Apr 2018 10:30:22 AM	174.108.105.91 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #53

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Walking alone or with my spouse and having our kids ride their bikes is something we like to do when it's warm.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes, but not in areas surrounded by trees (ie some parts of the Greenway near downtown concord. I don't like to walk there by myself.
What improvements would you like to be made to support walking and biking in Concord?	More long stretches that don't cross roads. Love the tunnel on the greenway!
What areas of the City would you like to see have more bike and pedestrian facilities?	Unsure
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Currently able to walk to downtown from where I live...anywhere else would probably be too far.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Union street/Fryling Ave
Name	Alison Lambety
Address	
Email	ambillings@gmail.com
Phone Number	

Created 26 Apr 2018 11:30:34 AM	24.74.191.127 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #54

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	My family and I love to walk, bike, and run on nearby trails and sometimes around the neighborhood streets.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	If we're on our neighborhood trails, yes. If we go on the streets, I don't feel very safe and I worry about our kids.
What improvements would you like to be made to support walking and biking in Concord?	I would love to see more sidewalks and safer pedestrian access around Concord Mills to Christenbury area.
What areas of the City would you like to see have more bike and pedestrian facilities?	Around Concord Mills to Christenbury
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	From our neighborhood in Christenbury to Concord Mills
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Christenbury Parkway and Cox Mill Rd
Name	Paul Arnone
Address	
Email	pfarnone@gmail.com
Phone Number	

Created 26 Apr 2018 12:40:57 PM	12.218.127.178 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #55

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk, run and bike and try to stay off the streets as much. I visit parks and greenways regularly. I would bike much more if any of the parks were connected.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.

Only in parks and greenways and some sidewalks. Many streets are difficult to cross. US 29 is impossible and dangerous. On Church Street downtown, the signal lights do not change unless a car comes up the hill from the Post Office/McCachren area. At the crosswalk near the jail, vehicles to not stop even when the pedestrian as a "walk" symbols. They continue to illegally right turn on red (not stopping at all). Other areas are not safe such as Church Street where Locke Mill residents try to get across the street to Danny's. The city and DOT also should reconsider some of their landscaping/bush requirement. The trees and bushes often block drivers' view of crosswalk as well as other traffic. In my opinion there should be not bushes within 20 feet of an intersection or crosswalk.

What improvements would you like to be made to support walking and biking in Concord?	Connect the greenways and when you do extend greenways avoid steep inclines such as the one from Mickey McGee park going north toward Cabarrus Avenue. The street portion is so steep skateboarders are even afraid to ride down them. I expect you will get an EMS call sometime for a heart attack trying to get up that sidewalk.
What areas of the City would you like to see have more bike and pedestrian facilities?	I would like to see Vietnam Veterans Park (Kannapolis) connected to Concord in someway, to see the Hector Henry Greenway extended all the way to Moss Creek (Harris Road Middle). I would like to see a greenway and pedestrian route that cross Concord Parkway. I have ridden my bike work before from Rock Hill Church Road, but i don't feel safe getting to downtown Concord because of Concord Parkway. How about a bridge over the street somewhere.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	All parks (both in Concord and outside), Concord Mills, hospital, Carolina Mall, Charlotte Motor Speedway. Complete the Carolina Thread Trail. Downtown Concord, connectors to Kannapolis. Connect Dorton Park to Afton Ridge.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	2924 Dylan Place NW
Name	Mark Plemmons
Address	2924 DYLAN PL NW CONCORD, NC 28027 United States
Email	plemmons.mark@gmail.com
Phone Number	(704) 786-0001

Created 26 Apr 2018 12:52:06 PM	104.129.194.90 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #56

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I walk 5-6 times a week in my neighborhood and sometimes use the greenway. I live off South Union.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Overall, yes. Although, as a female I am careful about walking downtown since there is a transient male population which sometimes has made comments that do not make me feel safe.
What improvements would you like to be made to support walking and biking in Concord?	More bike trails with designated lanes so biking downtown is safer.
What areas of the City would you like to see have more bike and pedestrian facilities?	Downtown.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Louise Drive
Name	
Address	
Email	
Phone Number	

Created 26 Apr 2018 2:18:34 PM	75.90.48.75 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #57

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes! I love walking and riding in Concord with my family for exercise and just as a family outing.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Walking, always. Cycling, only on really wide roads and roads with cycling lanes (that are clean enough to ride in.)

What improvements would you like to be made to support walking and biking in Concord?

I'm going to offer one HUGE option that cyclists AND motorists would probably all get behind. Currently, if you want to ride your bike in or out of Concord, particularly for exercise purposes, you have the following options: North via Church Street and Highway 29; which is not great due to traffic and lack of cycling lanes. South via Airport Road which has a long climb and horrible for traffic. Concord-Salisbury and 73; again - Long Climbs and impatient traffic. The "best" way is actually to take Wilshire out towards Central Cabarrus. So, here's the secret. There's no way across Cold Water Creek except Centergrove in Kannapolis (currently Closed) or Concord-Salisbury or 73. So, approach land owners somewhere off of Burrage Road and also off of Penninger Road and figure out how to put a bike crossing to get out to Penninger. From there we can get to Sapp, and to the country safely. Motorists would no longer have to deal with us on Concord-Salisbury, 73, etc. on a regular basis. a single wooden bridge and greenway style pavement, along with a right-of-way is all that it would take...

What areas of the City would you like to see have more bike and pedestrian facilities?	Any updates would be nice. Actually, a mountain bike course (or more) would be welcomed. Currently, the closest option is on private land off of Parks Lafferty road. Beyond that, to my knowledge, Concord has ZERO options to mountain bike.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I'd bike anywhere that was safe enough to do so!
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Parkwood Dr. and Central Drive.
Name	Sean Earnhardt
Address	211 Parkwood Drive Concord, NC 28027 United States
Email	searnhardt8@hotmail.com
Phone Number	(704) 792-0210

Created 26 Apr 2018 6:09:35 PM	75.90.51.239 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #58

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I run 3 to 4 times per week
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes
What improvements would you like to be made to support walking and biking in Concord?	Connect all of the parks with greenways
What areas of the City would you like to see have more bike and pedestrian facilities?	Connect all of the parks with greenways
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Connect all of the parks with greenways
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Kevin Kruse
Address	721 Orphanage Road Concord, NC 28027 United States
Email	kevinkruse@carolina.rr.com
Phone Number	

Created 26 Apr 2018 6:15:54 PM	172.72.240.135 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #59

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, it is an activity that can be enjoyed by everyone in our family. It is a great excuse to get away from the TV and video games and we frequently use our local greenway.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Absolutely! It is a great community experience using our greenways. We see friendly faces, many we know, and it brings back memories of a more simple time when we didn't fear strangers so much.
What improvements would you like to be made to support walking and biking in Concord?	Only more access areas as the city grows. Also, it would be neat to see a biking program similar to what Charlotte is attempting. (The rentals).
What areas of the City would you like to see have more bike and pedestrian facilities?	Since we are near Mt Pleasant, I would love to see another park and greenway out towards the schools there. Maybe a whole new park off of 49!
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Downtown. It isn't feasible from my home but my parents are closer downtown. More sidewalks are always nice but I don't think we are lacking access to downtown as far as biking or walking.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Hess Rd and Cold Springs. We also have family off of Crestside Dr.
Name	Brandi Gore
Address	879 Hess Rd Concord, NC 28025 United States
Email	chrisagore@aol.com
Phone Number	(704) 960-9051

Created 26 Apr 2018 6:18:34 PM	174.193.136.71 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #60

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Walking is definitely a part of my daily routine and I really like this idea. If it were to come to fruition, I would also consider adding biking as well. It would be nice if there could be bikes available to rent.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes, I always feel safe, but that is because I walk with a partner if it is later in the day. However, I walk alone in the late mornings and I always feel safe since it is earlier in the day.
What improvements would you like to be made to support walking and biking in Concord?	Lighted walkways/pathways and some form of security on foot, bikes or segways.
What areas of the City would you like to see have more bike and pedestrian facilities?	In the park areas, near downtown, Afton Ridge and around the YMCAs or other recreational type facilities. This helps folks save money in not having to join a gym to maintain an exercise routine.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	In parks, near downtown and near Afton Ridge
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Odell School Road and Davidson Hwy
Name	D. G.
Address	
Email	
Phone Number	

Created 26 Apr 2018 6:27:35 PM	75.181.3.160 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #61

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk daily attempting 3 miles per day. This would benefit me greatly allowing me to increase my days per week as well as feel safe.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	In my development some what however you always have to consider individuals who do not adhere to the bylaws and allow their pets to roam. I normally walk with a stick for minimum safety. I would feel safer utilizing a green way with other like individuals.
What improvements would you like to be made to support walking and biking in Concord?	Bike lanes or walking trails throughout the city and rural areas.
What areas of the City would you like to see have more bike and pedestrian facilities?	Rural areas. Hwy 49/ 601 area.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Piney Church Road and Zion Church Road.
Name	L Johnson
Address	28025 United States
Email	lnjohnson704@gmail.com
Phone Number	(704) 784-6344

Created 26 Apr 2018 7:32:55 PM	67.140.33.91 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #62

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes! I walk at lunchtime everyday. But I work in Charlotte...I want to bike in Concord, but the only good bike path I've found is over off Highway 3...I live by the speedway...would love something closer!
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes! I often take my grandkids for a bike ride on that path along Hwy 3.
What improvements would you like to be made to support walking and biking in Concord?	More Bike paths! For both pedestrians and bikers.
What areas of the City would you like to see have more bike and pedestrian facilities?	Near the Speedway
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I'd love to be able to ride over to Concord Mills or to Concord Commons
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Morehead and Hudspeth
Name	
Address	
Email	
Phone Number	

Created 27 Apr 2018 5:28:32 AM	172.72.222.12 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #63

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. A typical day might include a run or walk on the Greenway, a walk from home downtown to go to the library, a restaurant or store and a bike ride out into the country near Faith, Gold Hill or Rimer.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel safe for the most part. The only time I'm uncomfortable is when leaving or returning to the city on a bike ride. The stretches on Old Salisbury Rd from Branchview to Sapp Rd and on Corbin Ave from Gold Hill Rd to Branchview make me nervous because of the combination of lane width, traffic volume and vehicle speed. A couple of feet wider lanes would make reaching the quiet country roads much easier.
What improvements would you like to be made to support walking and biking in Concord?	Wider traffic lanes on roads heavily used by bicycles.
What areas of the City would you like to see have more bike and pedestrian facilities?	Poplar Tent corridor from Hey 29 to George W Lyle's. How would you ride a bike between those 2 points? Downtown Concord to downtown Kannapolis. Linking Cabarrus greenways to Mallard Creek Greenway near UNCC.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Afton Village from Gibson Village. Carolina Mall.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	155 Cedar Dr NW
Name	Paul Smith
Address	155 Cedar Dr NW Concord, NC 28025 United States
Email	smithp@carolina.rr.com
Phone Number	(704) 222-6172

Created 27 Apr 2018 5:51:30 AM	65.184.65.178 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #64

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk my pet around the neighborhood.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	In our neighborhood and on a sidewalk yes, but not when there is not a sidewalk. I do not like walking on the main street (Roberta Rd.) as it has no path for us and we must share the road with cars who always drive over the speed limit and there are no lights if it is dark.
What improvements would you like to be made to support walking and biking in Concord?	Connected sidewalks or bike paths to the local parks like Frank Liske Park to our neighborhood. Currently we have to get in our car to go there.
What areas of the City would you like to see have more bike and pedestrian facilities?	In or closer to neighborhoods. This way the children of the communities can spend time with their friends that live close to them while being close to home, within minute walking distance.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	A playground. Currently there is not a playground within walking distance so we must get in our car to travel. I would like to see this closer to my community/neighborhood, Meadowbook Lane off of Roberta Rd. Many improvements have been made to the downtown areas by the City but the subdivision areas are filled with houses over and over, and no area is planned or set aside for green space or play space for children or pets.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	1032 Meadowbrook Ln SW
Name	Nora May
Address	1032 Meadowbrook Ln SW Concord, NC 28027-1737 United States
Email	noraisabellamay@gmail.com
Phone Number	(704) 680-2704

Created 27 Apr 2018 6:44:36 AM	173.92.60.118 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #65

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk alot just to get out and enjoy nature.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I do for the most part, but there are far too many roads that do not have sidewalks. I usually travel to one of the greenways
What improvements would you like to be made to support walking and biking in Concord?	It would be good if biking is restricted on certain roads (esp. 2 lane roads without bike lanes) during busy times, like rush hour. Someone is going to get hit by these inconsiderate drivers. Sidewalks are helpful and love the greenways.
What areas of the City would you like to see have more bike and pedestrian facilities?	I can't speak for bikes, I'm afraid I haven't really noticed unless there's a dangerous situation. The green-way off of Weddington road should definitely be extended. Some of the developments off 49 are not built for pedestrians or bikes.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	to uptown
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	White - Cabarrus
Name	
Address	
Email	
Phone Number	

Created 27 Apr 2018 6:49:14 AM	152.15.112.17 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #66

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.

I bike almost every day (between 3500 and 500 miles a year). Several times a month my family walks the downtown area, the greenways and the local parks.

I am the President of the Central Carolina Cycling Club based in Concord/Kannapolis. Cycling is a major part of my day to day life. We have between 75 and 100 active members and ties to hundreds of other cyclists in the area. We have offered our expertise and service to administrators over the years, but have not been able to find a receptive audience.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.

In the areas where walking is part of the infrastructure, I do feel relatively safe. But for the majority of roads in the Concord area, walking is not an option. All you have to do is look at the worn paths in the grass along the side of the road in most areas to see that walking is a necessary and pathetically underserved form of transportation for many people in the community. The infrastructure focus in Concord is 100% about cars. Bridges are narrow with no shoulders, and don't allow pedestrians to safely cross. As an avid cyclist, I have way too many recommendations to list on this form. It would cover a book. Please call me and we can set up a time to discuss in person.

What improvements would you like to be made to support walking and biking in Concord?

I would like the city to actively promote cycling and walking within the community. There is little to no engagement with the cycling community. Again, please call to discuss.

The biggest concern right now are the bait and switch "bike lanes". The running joke in the cycling community is that every bike lane in Concord is a road to nowhere. They are filled with gravel, broken glass, spark plugs, (yes spark plugs, frequently and many) nails, trash and lawn/yard debris. The northbound bike lane on Church street is especially ridiculous. Before it ends into nothing, it forces cyclists to dodge sunken drains, broken pavement, and then dumps them right into traffic before there is a legitimate intersection. When riding the southbound bike lane on Church Street, you come to the intersection at Winecoff, and it forces you to make an unsafe transition across the turn lane to keep going straight. This is extremely poorly designed infrastructure, and another reason why cyclists in the community feel that the addition of the bike lanes was for no other purpose that so "say" that the city has bike lanes. The bikes lanes and road diet on Cabarrus Ave were a welcome addition, but again, this is a road to nowhere.

What areas of the City would you like to see have more bike and pedestrian facilities?

We cannot enter or exit the city on a bicycle safely. There are only so many ways to enter and exit, and each has its own unique challenges.
1) HWY 29, this is just not a safe route, speeds are too high with no shoulders.
2) Hwy 601, Speeds are too high with no shoulders or room to ride.
3) Old Salisbury Concord Rd - Blind corners, hills that slow cyclists down and stack cars up behind, no shoulders, steep drop offs into the ditch, high speeds.
4) HWY 73, blind corners, high speeds, hills, narrow bridges that pinch cyclists into oncoming traffic where there are decent shoulders.
5) Old Airport Rd - Blind hills, blind corners, high speeds, hills that stack cars up behind cyclists that create frustration
6) Lake Concord, Rd, Route 3, high speeds, no shoulders, bridges narrow.
7) Any route to and from Kannapolis is stacked with obstacles, Central Ave (forget about that) HWY 29 by the mall is like running the gauntlet, the new bridge over the railroad has a wide shoulder in one direction, but nothing in the other.
8) Hwy 49. Google "Adam Little"
I would like to see an emphasis on routing cycling traffic in and out of the community.

Concord keeps annexing areas and allowing developers to create subdivisions that increase the traffic on what were formerly rural roads. This now makes it even more dangerous to walk or cycle these roads that used to be considered "the country". The St Andrews subdivision off of Zion Church/Piney Church creates traffic jams every morning. I see kids

walking home from Central Cabarrus high School every day through the ditches on the side of the road. On rainy days they are forced to walk the 6 inches of shoulder because the ditches are filled with water.

Sidewalks, or even informal pathways are needed. the city needs to force developers to address these issues. I understand they put sidewalks in but they go nowhere. New sidewalks end abruptly, and it's multiple decades before anything is done with adjacent properties to connect the sidewalks to anything useful.

I could go on and on. Again, please call me with questions.

What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	At this point, because there are 0 safe routes in the community, we would go almost anywhere. The targets would be to have paths from any place to any place. For instance, let's say we started from downtown. We currently can't get anywhere. If we want to get to the mall, we have to deal with 29, or Lake Concord. If we wanted to ride Cabarrus Ave toward 601. It it's dead end and there is no safe way to proceed to any of the businesses or shops. There are no routes from homes or population centers to any destinations.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	The largest intersection closest to my place of residence is Central Heights Rd and Zion Church Rd.
Name	Matt Hartman
Address	
Email	matt@fourmattech.com
Phone Number	(704) 793-6739

Created 27 Apr 2018 9:35:10 AM	173.92.34.141 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #67

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. Walk for fitness. Bike for fitness and commute to eork
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Don't feel safe on my bike commute route. I feel safe walking in Concord but I choose my routes carefully.
What improvements would you like to be made to support walking and biking in Concord?	More greenways and or sidewalks. More bike lanes on busy roads
What areas of the City would you like to see have more bike and pedestrian facilities?	NW Concord
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	CHS NE, grocery stores , connection to Kannapolis Village Park area
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	
Address	Sherwin Lane 28025
Email	
Phone Number	

Created 27 Apr 2018 2:36:58 PM	172.72.70.53 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #68

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk my dog in my neighborhood and use the dog park on Weddington Rd Have walked on the Greenway in downtown Concord
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes I usually only go during lighted hours for safety
What improvements would you like to be made to support walking and biking in Concord?	Connect more areas. Laurel park connecting to Harris Teeter shopping area by walking would be great.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Laurel Patk
Name	Karen Hopes
Address	
Email	kmhopes@hotmail.com
Phone Number	

Created 28 Apr 2018 3:46:00 PM	174.108.106.158 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #69

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I am a runner but I also walk and bike. This is a regular part of my daily life. I usually run on the roads where I live but I do utilize the parks often too.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I have never felt unsafe at the parks.
What improvements would you like to be made to support walking and biking in Concord?	I had a very hard time following the signage that connects the two green ways in concord. That could be improved upon.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Terri Winowich
Address	3350 Mt. Pleasant Rd. N Concord, NC 28025 United States
Email	tlwrunner@msn.com
Phone Number	

Created 28 Apr 2018 4:54:03 PM	173.185.106.202 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #70

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. Daily walks with the dog. We usually go to Dorton Park or the walkway near Publix.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	All the time.
What improvements would you like to be made to support walking and biking in Concord?	
What areas of the City would you like to see have more bike and pedestrian facilities?	Poplar Tent, Montford, Groff, etc.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	See above.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Laurie Hatfield
Address	386 Wakemeadow Place NW Concord, North Carolina 28027 United States
Email	lahatfield@carolina.rr.com
Phone Number	(704) 408-2760

Created 29 Apr 2018 8:35:36 AM	208.69.133.67 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #71

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I go running in the mornings.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Not all places. Lots of streets don't have street lights. For example Dorton Park, there aren't that many street lights but maybe having a blue light emergency pole for a phone to call 911 if necessary. Frank liske park, can it be opened earlier? The greenway had no lighting.
What improvements would you like to be made to support walking and biking in Concord?	Consistent bike lanes on roads. Greenways that connect through neighborhoods for easy access
What areas of the City would you like to see have more bike and pedestrian facilities?	Near Harrisburg. Roberta Road thst leads to Frank Liske
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	From the speedway to downtown Pitts school road
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Pitts school and roberta road Pitss school and 49
Name	
Address	
Email	
Phone Number	

Created 30 Apr 2018 6:41:19 AM	4.16.127.129 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #72

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I cycle and walk several time weekly. Cycling most usually starts and ends in the city of Concord, and almost always involves use of the Greenway adjacent to Branchview. My wife and I also walk part or all of the Greenway two to three times weekly.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I always feel safe walking. While cycling, my greatest fears are collision with a motor vehicle and the difficult-to-understand anger shown by too many drivers toward cyclists. Shouting, passing within a foot of the rider, purposely veering toward the cyclist, and "cold-rolling" are all unsettling.
What improvements would you like to be made to support walking and biking in Concord?	More bike lanes everywhere would be ideal. As that is very expensive, widening of shoulders on heavily trafficked road - such as Old Concord Salisbury Road or Old Airport Road - would be most welcome. It would also be very good to have the Branchview Greenway connect to Carolinas Place Mall, and to other areas where it might be possible to accomplish errands and access public transit.
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Carolinas Place and Concord Mills malls, the Depot, Intimidators Stadium/Kannapolis, Frank Liske Park.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Lawndale Avenue and Union Street
Name	Norman Lefebvre
Address	70 Lawndale Avenue SE Concord, NC 28025 United States
Email	Norman_Lefebvre@yahoo.com
Phone Number	(704) 652-1544

Created 30 Apr 2018 6:57:43 AM	24.74.191.159 IP Address
PUBLIC	

Loading comments ...

Concord Connectivity Analysis Community Input #73

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Enjoy cycling for fitness
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Cycling does not feel safe on most secondary roads.
What improvements would you like to be made to support walking and biking in Concord?	More bike lanes
What areas of the City would you like to see have more bike and pedestrian facilities?	SW Concord. Poplar Tent, Pitts School Rd, Roberta. Ideally a bike lane all the way down 29 to the light rail would be best case scenario.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	UNC Charlotte, Light Rail line.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Rt 29/Pitts School Rd
Name	COURTNEY PROTHERO
Address	4805 CHESNEY ST NW CONCORD, NC 28027 United States
Email	cprothero@gmail.com
Phone Number	(704) 706-3223

Created 30 Apr 2018 7:43:13 AM	65.213.147.254 IP Address
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Concord Connectivity Analysis Community Input #74

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, I work from home so I try to find ways to get out of the house as often as possible. I ride my bike 50+ miles a week, but have very few options of where to go. I also try to walk to stores/restaurants as often as possible, but there are limited options there, as well.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.

Usually not! There are very few places to feel safe riding a bike, as most roads are too narrow, have too much traffic, have too high speed limits, or all of the above! Most newer construction throughout the entire Charlotte area seem to be taking this into account better, but there is still a long way to go.

For walking, I live in Christenbury and would like to be able to walk to Concord Mills and to Cox Mill Elementary/High Schools, but there are no safe options for either of those! There need to be far more sidewalks in areas like this, especially considering all the new neighborhoods that are growing so quickly around here.

What improvements would you like to be made to support walking and biking in Concord?

For biking, there need to be more bike lanes, and there needs to be better foresight when it comes to keeping the roads up to date with the surroundings. There are so many roads (like Poplar Tent, Hwy 73, Odell School, Cox Mill) that have fast-growing populations nearby and are way, WAY overcrowded as a result. All of these roads (and others like them) need to be wider and safer for both vehicles and bicycles!

For walking, as mentioned above, there need to be more sidewalks in these fast-growing neighborhoods. Walking trails are always nice, too, but I believe that the first place to start is with sidewalks. The more accessible places are via walking, the more active we will all be!

What areas of the City would you like to see have more bike and pedestrian facilities?	Concord Mills and Cox Mill areas!
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	As mentioned before, the corridor between Concord Mills and Cox Mill Elementary/High Schools. The Christenbury neighborhood should be connected to both of these via sidewalk, especially since there are 3 more neighborhoods being built along this corridor right now!
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Kevin Henderson
Address	2353 Herrons Nest Place NW Concord, NC 28027 United States
Email	kevhender@gmail.com
Phone Number	(540) 520-2559

Created 30 Apr 2018 10:46:03 AM	209.136.227.218 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #75

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. Mainly weekends - Running downtown loop and biking Union St.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes
What improvements would you like to be made to support walking and biking in Concord?	More multi-use paths
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	The Depot and Clear Water Studio
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Spring/Cabarrus
Name	
Address	
Email	
Phone Number	

Created 1 May 2018 11:04:51 AM	166.82.104.11 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #76

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. Active living is very important and my family views it as a quality of life aspect.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Walking - Yes where there are sidewalks. Biking - No. Very dangerous.
What improvements would you like to be made to support walking and biking in Concord?	Increased development of multi-use paths along roads and increased development of greenway trails.
What areas of the City would you like to see have more bike and pedestrian facilities?	All areas.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Church Street, Branchview, Downtown
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Corban and Branchview
Name	
Address	
Email	
Phone Number	

Created 1 May 2018 11:16:37 AM	166.82.104.11 IP Address
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Concord Connectivity Analysis Community Input #77

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Walk or ride often
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes to walking, no riding
What improvements would you like to be made to support walking and biking in Concord?	Bike lanes, more sidewalks/ greenway space
What areas of the City would you like to see have more bike and pedestrian facilities?	All
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Any
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Church/palaside
Name	
Address	
Email	
Phone Number	

Created 1 May 2018 11:24:35 AM	75.90.158.166 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #78

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Only in greenways and community pathways only. Road raze keeps me and my family away from most places.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No, don't feel safe outside community or greenways. road raze and single lane roads are very common in our county. Despite the population increasing, the roads have not expanded to handle traffic Even in community driving seems to be rash. Prefer the kids to cycle on walkways than road.

What improvements would you like to be made to support walking and biking in Concord?

Would love to see bike ways/ pedestrian routes connecting our communities to greenways and schools.

These walk/bike routes must be wide and at least 5 -10 feet away from the main roads (similar to Hilton Head)

Pathways over streams should have solid boundary walls to prevent accidental slipping during truant weather.

Biking to home schools should be encouraged through these pathways. However, for safety , students should bike in groups and it is necessary for bike route to be broad.

Greenways to be connected as well.

Water fountains at intermittent intervals for people and pets.

Cycle stands at key points such as greenways/ schools

Rent-a-bikes (including easy ride support) at points within city. California is introducing this.

What areas of the City would you like to see have more bike and pedestrian facilities?	Every place ... but communities around Concord mills mall and cox mill road
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Just about most places, greenways, strip Malls, school, grocery stores,
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Cox mill road and Christenbury parkway- next to cox mill elementary and high schools
Name	Smita Paul
Address	
Email	tellmimore@yahoo.com
Phone Number	

Created 2 May 2018 6:39:50 AM	65.184.30.10 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #79

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I enjoy riding my bike for exercise and walking my dog at Frank Liske park. I would like to be able to walk or ride to the park from old Charlotte but there's no sidewalks or shoulders
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No, there is too much traffic and nowhere to walk or ride my bike.
What improvements would you like to be made to support walking and biking in Concord?	Sidewalks would be a great start, and then bike lanes
What areas of the City would you like to see have more bike and pedestrian facilities?	Southwest Concord form hwy 49 toward downtown Concord
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Frank Liske park to downtown
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	88 Eastside Drive SW
Name	B Smith
Address	88 Eastside Drive SW Concord, NC 28027 United States
Email	bensmith1230@windstream.net
Phone Number	(704) 609-9739

Created 2 May 2018 7:23:05 AM	174.193.149.103 IP Address
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Concord Connectivity Analysis Community Input #80

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Walking yes. Biking no because I won't risk riding on Charlotte streets and our path is too short toride.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Walking yes although I do not walk after the sun goes down. I don't bike because of crazy drivers.
What improvements would you like to be made to support walking and biking in Concord?	Connect the walk/bike paths to make them longer and go into other neighborhoods.
What areas of the City would you like to see have more bike and pedestrian facilities?	A sidewalk from Christenbury neighborhood to businesses in Chrisenbury Corners.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Area near Christenbury
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Donnington Lane NW
Name	Christine Weigel
Address	2254 Donnington Lane NW Concord, NC 28027 United States
Email	chris@theweigels.us
Phone Number	(715) 222-3777

Created 2 May 2018 8:45:33 AM	173.92.10.135 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #81

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes. I prefer to walk for exercise and to help reduce car emission pollution.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I am safe inside my Laurel Park subdiv, but I am not safe walking from there to Publix, or to Food Lion, or to Harris Teeter. We need sidewalks there.
What improvements would you like to be made to support walking and biking in Concord?	Please construct a sidewalk along George Lisle Parkway between Target and Publix.
What areas of the City would you like to see have more bike and pedestrian facilities?	George Liles Parkway
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Shopping Centers (Target, Food Lion, Publix etc).
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Laurel Park entrance to George Liles
Name	sophia cliffe
Address	2525 Bellingham Dr. NW Concord, NC 28027 United States
Email	sophiarose209@gmail.com
Phone Number	

Created 2 May 2018 8:46:42 AM	173.92.39.47 IP Address
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Concord Connectivity Analysis Community Input #82

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, I regularly walk the greenway and sometimes ride my bike through the Concord area to the Greenway where it feels safer to ride my bike.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Walking is not a problem. Biking is sometimes a challenge as the streets are not conducive to bike and motor traffic and often the sidewalks are close to the streets with street lamps blocking safe biking.
What improvements would you like to be made to support walking and biking in Concord?	I would like to see bike lanes where they are feasible and to have maps which would provide these routes.
What areas of the City would you like to see have more bike and pedestrian facilities?	Union Street, Church Street, and or Spring Street as well as Corban, Cabarrus and Buffalo.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Food Lion shopping center, Greenway access to McKey McGee park, Les Myers Park, Downtown Concord, Locke Mille and the Board of Elections, Old Concord Theater.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	280 Virginia St
Name	Carol Anderson
Address	280 Virginia Street SE 280 Virginia St Concord, NC 28025 United States
Email	carolanderson0817@gmail.com
Phone Number	(229) 269-6775

Created 2 May 2018 10:23:54 AM	98.16.177.9 IP Address
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Concord Connectivity Analysis Community Input #83

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Walk with the dog .. often go to Weddington Bark Park to walk greenway
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Not really “safe” feeling there but keep my eyes open !!!
What improvements would you like to be made to support walking and biking in Concord?	Feel Weddington Rd would b a great area to put bike path past all the schools to the greenway at Publix but feel all trucks should b banned from Rock Hill Church to George Liles they can take 29 to George Liles to 85... there will b a big influx of young adults with cars when the high school opens and maybe some of them would walk/ scooter/ Segway/if there was a great option from Sheffield/ Laurel/ Rock Hill... actually great way for families to get to sport activities at Weddington schools.. WALK!!
What areas of the City would you like to see have more bike and pedestrian facilities?	As I said above.. u r building a high school with no pedestrian access!!
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Again the George Liles/ Weddington corner would b a great area to access by foot!!
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Asheford Green lived here 27 years and have seen Weddington Rd turn into probably the most dangerous corridor in Cabarrus county for pedestrians , landscapers, bikers, and of course motor vehicles.... get rid of trucks!!!
Name	Pat Christopherson
Address	1191 Asheford Green Concord, NC 28027 United States
Email	cfps01@aol.com
Phone Number	(704) 699-7020

Created 3 May 2018 4:07:09 AM	75.190.33.16 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #84

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes and we walk our community daily.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	We do feel safe walking on the sidewalks of the community.
What improvements would you like to be made to support walking and biking in Concord?	We would like to see more greenway connections.
What areas of the City would you like to see have more bike and pedestrian facilities?	Specifically we want to know what it would take to get a connection in the Villages at Skybrook North to the Rocky River Greenway. We understand that this greatly benefits Moss Creek and since we have portion of the Rocky River in our community to the east, we want to know what we can do to gain a pedestrian connection.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	River Oaks Drive and Middlecrest
Name	
Address	
Email	scott@bpropnc.com
Phone Number	

Created 3 May 2018 7:19:51 AM	172.73.71.173 IP Address
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Concord Connectivity Analysis Community Input #85

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I TAKE MY CHILDREN ALONG THE GREENWAY, ON OUR BIKES AND FOR A LONG WALK
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	YES, THE OPEN AREAS MAKE YOU FEEL AS IF NOTHING WILL WONT BE SEEN AND IF SOMETHING DOES HAPPEN, SOMEONE WILL HELP
What improvements would you like to be made to support walking and biking in Concord?	OFFER MORE EVENTS ALONG THE GREENWAY
What areas of the City would you like to see have more bike and pedestrian facilities?	DOWNTOWN CONCORD
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	FROM THE ACADEMY REC CENTER TO THE MCMICKEY PARK
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	SPRING STREET
Name	AMBER TALBERT
Address	118 ACADEMY AVE CONCORD , NORTH CAROLINA 28025 United States
Email	AMBERBRBITTTA3@GMAIL.COM
Phone Number	(704) 602-4784

Created 3 May 2018 1:05:57 PM	166.82.104.11 IP Address
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Concord Connectivity Analysis Community Input #86

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I live near downtown and frequently walk to shops and the library on Union St. Sometimes I walk to the Food Lion on Branchview as it is close to my house. However, crossing Branchview is dangerous. I often see people dashing across the street there. Installing a crosswalk there would help a huge amount.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I feel very safe walking around the Union Street neighborhoods. My husband and I moved to the downtown Concord area because we love walking. We feel very safe walking in downtown Concord! I feel less safe walking in other neighborhoods because of the lack of sidewalks and cross walks. I also don't feel that biking for transportation is a good idea as there are not enough bike routes. In particular, I wish there were a bike-friendly route to the Kannapolis Research Campus, which is where I work.

What improvements would you like to be made to support walking and biking in Concord?

I would love for sidewalks to be installed near the Carolina Mall, Hospital, and Transit Center. Currently, there is no easy way to walk from the Transit Center to the Carolina Mall and other shops and restaurants around there. I would patronize the shops and restaurants in that area if the area were more pedestrian friendly. I also wish there were sidewalks on Country Club Lane. Last but not least, there need to be ways for people to walk across the bridges over I85 at Copperfield Road and Concord Lake Road. I see people walking along the side of the roads there nearly every day. I worry about their safety!

What areas of the City would you like to see have more bike and pedestrian facilities?	The area around Carolina Mall, the Hospital, and the Sports Center on Country Club Lane. There are many apartment and condos on Country Club Lane and at least two bus stops, but no safe way for pedestrians to walk there.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	The shopping center on Branchview, the Carolina Mall, restaurants across from the hospital, and the Sports Center.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Edgewood Avenue and Church Street. Just to let you know, one reason my husband and I moved to the Edgewood Historic District was that we liked the cross-walk at the intersection of Church and Edgewood. Living in a pedestrian friendly neighborhood is very important to us.
Name	
Address	
Email	
Phone Number	

Created 4 May 2018 12:24:49 AM	216.43.244.66 IP Address
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Concord Connectivity Analysis Community Input #87

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes we walk the Greenway it is very convenient and the length is perfect. The new extension is a added beauty
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes
What improvements would you like to be made to support walking and biking in Concord?	More biking lanes on the main roads
What areas of the City would you like to see have more bike and pedestrian facilities?	Just continue to add to the current greenway
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would like to safely bike to Kannapolis , and China Grove perhaps even Davidson
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	70 Lawndale Ave Concord NC 238025
Name	Pam Lefebvre
Address	70 Lawndale Ave Concord, NC 28025 United States
Email	
Phone Number	(704) 496-1834

Created 9 May 2018 10:03:35 AM	56.0.84.24 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #88

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes! I would love to have more connectivity so that I could bike around town without being in traffic. Ideas such as bikes lanes, bike friendly trails that connect to shopping areas would be great
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Only if on the sidewalk or a greenway. I do not feel comfortable on the streets especially if I want to bring my children along. The bike lanes are very limited and the streets are not easily crossable. There is not a culture of biking in this area and the residents are not very tolerant. Extra bike lanes and promoting tolerance of bikers and bike/traffic safety would be nice.
What improvements would you like to be made to support walking and biking in Concord?	Bike lanes on busier streets Greenways that connect to residential areas and shopping districts
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	
Address	
Email	
Phone Number	

Created 14 May 2018 8:20:08 PM	166.82.171.199 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #89

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes! I live within 1/2 mile of Walmart. It can actually be quicker to WALK there (via back road access) then to drive, stop at lights and park in the huge parking lot!.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	If I go out of my way to feel safe, I do feel safe! But we do need more sidewalks around the mall. Concord Mills. I live less then 1 mile from there but cannot walk to Panera (Safely) from my home do to NO Sidwalk!
What improvements would you like to be made to support walking and biking in Concord?	More More More.. Also would love to see a sidewalk to my schools (I have an elementary and high school 3/4 mile down the road) on Cox Mill Rd.. NO SIDEWALKS though.. ALso make developers to put in sidewalks not only in front of their subdivisions but extended a ways down the road
What areas of the City would you like to see have more bike and pedestrian facilities?	Western Concord .. around Cox Mill Elementary and Cox Mill HS.. Also from Cox Mill / Christenbury Intersection to the Mall. (only need 1/2 mile or so of additional sidewalks)
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would bike to Charlotte Motor Speedway!! Seriously to avoid the traffic during race weekends?
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	2295 HERRONS NEST PL NW
Name	Jenny Reed
Address	2295 HERRONS NEST PL NW CONCORD, NC 28027 United States
Email	thereedsnc@aol.com
Phone Number	(704) 770-5442

Created 16 May 2018 3:34:34 PM	75.181.23.173 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #90

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes, daily walking and cycling for our entire family ranging in ages from 7 to 49
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Not many trails or safe riding areas outside of private neighborhoods
What improvements would you like to be made to support walking and biking in Concord?	Increased bike lanes on roads, connections of sidewalks between neighborhoods, main areas of interest
What areas of the City would you like to see have more bike and pedestrian facilities?	Close to Concord Mills mall connecting neighborhoods to those areas, towards the speedway as well
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Schools, malls, local dining areas- more likely to walk or ride bikes if it was accessible versus driving
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Herrons Nest PL NW and Camden Town
Name	Cristina Moore
Address	
Email	cmm0822@gmail.com
Phone Number	(980) 333-5037

Created 19 May 2018 10:44:11 AM	107.77.234.190 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #91

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	my family and I love to walk and bike in our community. We wish so much we could walk to stores and restaurants.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes.
What improvements would you like to be made to support walking and biking in Concord?	Walking/biking trails from Christenbury neighborhood to stores and restaurants.
What areas of the City would you like to see have more bike and pedestrian facilities?	Same as above.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Christenbury Wood.
Name	Chante Walter
Address	
Email	chantewalter13@gmail.com
Phone Number	

Created 19 May 2018 11:07:03 AM	99.203.142.190 IP Address
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Concord Connectivity Analysis Community Input #92

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Walking is... I'd like to be able to walk along Christenbury Parkway to all the restaurants by Concord mills. Theyre only a mile away from my home.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	The area from highland creek down Christenbury Pkwy toward the mall is safe. I've never felt as though I woyldbt want to walk there
What improvements would you like to be made to support walking and biking in Concord?	In general I think sidewalks should be put in everywhere to encourage walking. Even down Cox Mill toward the school. There is no choice but to drive and there's a lot of traffic. The area by speedway and surrounding streets should have sidewalks all around
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Again, by all shopping. There has been a tremendous amount of development, shops restaurants etc. And a ton of apartments and residences are being built. In general. There should be sidewalks everywhere. it would cut down on vehicular traffic as well
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	I am a Christenbury resident. Christenbury hall dr and christenbury pkwy is my intersection. ..and I would love to see a light there or at least stop signs
Name	Rachel Petsiavas
Address	
Email	rpetsi@gmail.com
Phone Number	

Created 19 May 2018 12:12:48 PM	173.92.62.222 IP Address
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Concord Connectivity Analysis Community Input #93

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	We love to walk in our Christenbury neighborhood and also to shops, AMC movies and restaurants
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Mostly, except when there are no sidewalks.
What improvements would you like to be made to support walking and biking in Concord?	Sidewalks along every steeet
What areas of the City would you like to see have more bike and pedestrian facilities?	Around Christenbury Corners and Cox Mill rd
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Cox Mill Rd - from the high school to Concord Mills
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	9587 Ledbury Ct Concord NC 28027
Name	Aly Higgins
Address	9587 Ledbury Ct NE Concord 28027 United States
Email	alywheeler@gmail.com
Phone Number	(704) 575-1632

Created 19 May 2018 12:15:43 PM	173.92.9.43 IP Address
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Concord Connectivity Analysis Community Input #94

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Many Christenbury residents walk on a regular basis with walking clubs.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	We cannot walk outside of Christenbury Village as there are no sidewalks up to the shopping centers. And instead of going 35 mph the cars exceed 45 to 50. Dame on fox mill road outside of our neighborhoods.
What improvements would you like to be made to support walking and biking in Concord?	Take funds out of the sidewalk fund and put sidewalks in along Christenbury Parkway to connect to Christenbury Corners. We also have no Parks on this side of I-85 and closest park is for dogs on Weddington.
What areas of the City would you like to see have more bike and pedestrian facilities?	South of Derita Road.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Christenbury Corners. There ar crosswalks there but we can't walk to the intersection. Would be great to walk to the schools on Cox Mill. 512 homes here have to drive out of the neighborhood.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Barbara Walker
Address	2445 Christenbury Hall Dr. Concord, NC 28027
Email	
Phone Number	

Created 19 May 2018 1:23:13 PM	107.77.233.165 IP Address
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Loading comments ...

Concord Connectivity Analysis Community Input #95

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Absolutely! Our whole family participates in walking AND biking every weekend. During the week I take the kiddos myself!!
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I do feel safe but would love a walking area closer to my home.
What improvements would you like to be made to support walking and biking in Concord?	I would love to have a walking/biking path closer to my end of town. We don't even have a park close by!!
What areas of the City would you like to see have more bike and pedestrian facilities?	I would love to see the Concord Mills area have more pedestrian friendly paths. We have nothing over here at all!
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Concord Mills Mall area for sure. Not necessarily the mall but the eating and shopping establishments around it for sure!!
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Cox Mill Rd and Christenbury Pkwy
Name	Alison Conover
Address	
Email	alicat628@aol.com
Phone Number	(980) 322-4504

Created 19 May 2018 2:10:15 PM	166.82.189.170 IP Address
PUBLIC	

Loading comments ...

Concord Connectivity Analysis Community Input #96

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	We walk neighborhood almost daily. Biking limited due to lack of suitable bike paths to connect to local retail and restaurants. We would like to have connections - wider than sidewalks to allow us to ride, walk to nearby restaurants.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No. Lack of wide paths to ensure space for both walkers and riders to share easily. The new one near Publix on George Liles looks great! We need that along Christenbury Hall Parkwa/ /Briton Smith to connect neighborhoods to restaurants at Christenbury corners or from Highkand Creek to Edison Square.
What improvements would you like to be made to support walking and biking in Concord?	Wider paths parallel to streets but separate. Blue boxes periodically for safety along with riding Concord police.
What areas of the City would you like to see have more bike and pedestrian facilities?	Concord Mills area to schools on Cox Mill to Christenbury to Edison Square to along Derita Road north and south of Concord Mills.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Christenbury Corners, 26 Acres, Edison Square, parks (that do not exist YET) nearby.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	2203 Eversham Drive NW. Concord NC. 28027
Name	Lauri McCoy
Address	2203 Eversham Drive NW Concord, NC 28027 United States
Email	lauri_mccoy@sbcglobal.net
Phone Number	(317) 627-1629

Created 19 May 2018 3:10:25 PM	75.181.23.149 IP Address
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Loading comments ...

Concord Connectivity Analysis Community Input #97

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I run 3-4 times and walk 2 times a week and trails or sidewalks would be of great benefit to my routine.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes, I feel safe.
What improvements would you like to be made to support walking and biking in Concord?	I would like to see trails or sidewalks along Christenbury Prkway that are easily accessed by Cox Mill road. I would also like to see side walks or trails going to the schools along Cox Mill Road.
What areas of the City would you like to see have more bike and pedestrian facilities?	I would like to see more pedestrian facilities in and around the Concord Mills area.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	I would like to walk or up to the Christenbury Corners area from Cox Mill Road.
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	9622 Harvest Pond Ave NW
Name	Julia Anthony
Address	9622 Harvest Pond Ave NW Concord, North Carolina 28027 United States
Email	juliatony@hotmail.com
Phone Number	(704) 906-7184

Created 19 May 2018 3:36:06 PM	173.92.9.82 IP Address
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Loading comments ...

Concord Connectivity Analysis Community Input #98

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I would let my children bike or walk more but do not feel they are safe on Christenbury Parkway without a sidewalk.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No, absolutely not! There are cars driving too fast for families or children to be on bicycles on Christenbury Parkway near the new restaurant establishments and businesses. Unfortunately we cannot go there without driving and feel safe.
What improvements would you like to be made to support walking and biking in Concord?	It would be great to have sidewalks added from the Christenbury Hall community going all the way up to the new Christenbury Corners commercial sites. My children would love to bike up to QT and get an ice cream but we will not let them due to safety concerns.
What areas of the City would you like to see have more bike and pedestrian facilities?	Concord Mills area
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Christenbury Corners
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	9927 Clarkes View Place Concord, NC 28027
Name	Mindi Tarulli
Address	9927 Clarkes View Place Concord , NC 28027 United States
Email	mindi.tarulli@yahoo.com
Phone Number	(704) 724-1724

Created 19 May 2018 4:37:34 PM	107.77.233.235 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #99

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I walk several times per week.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	There are not enough sidewalks in Concord. For example, the Christenbury development is within walking distance of the Christenbury Corners shopping centers but there aren't sidewalks.
What improvements would you like to be made to support walking and biking in Concord?	
What areas of the City would you like to see have more bike and pedestrian facilities?	Cox Mill Road to Christenbury Corners. Cox Mill Road to Elementary and High Schools from all developments on Cox Mill.
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	My street address is 9541 Heritage Farm Avenue NW
Name	Anneliese Billings
Address	9541 Heritage Farm Ave NW Concord, NC 28027 United States
Email	mrsrhbillings@gmail.com
Phone Number	(910) 320-0086

Created 19 May 2018 6:14:02 PM	173.92.11.160 IP Address
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Concord Connectivity Analysis Community Input #100

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes it is. Currently I drive all the way to Charlotte downtown because there is no continuity in bike Lanes. Also the bike Lanes are not continuously marked. In some spots the roads are very narrow not allowing for two separated bike Lanes to be traversed without compromising biker safety.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	No. Not the least bit.
What improvements would you like to be made to support walking and biking in Concord?	Improve consistency of bike Lanes and pavement and markings.
What areas of the City would you like to see have more bike and pedestrian facilities?	Near Christenbury parkway, cox-mill Blvd, Concord Mills, derita road
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Near Christenbury parkway, cox-mill Blvd, Concord Mills, derita road
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Derita Rd - Concord Mills-Christenbury Parkway
Name	Sridhar Rao
Address	Camberley Ave Concord, NC 28027
Email	sridhardrao@gmail.com
Phone Number	(980) 622-4347

Created 19 May 2018 6:24:36 PM	144.178.4.56 IP Address
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Concord Connectivity Analysis Community Input #101

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes! My wife and I walk or bike for fitness every morning and occasionally walk or bike for transportation around historic Concord.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	In our neighborhood, historic Downtown Concord, we have ample sidewalks for safe walking. Crosswalks are a challenge due to increasingly inattentive (texting) drivers. Concord needs many more bike lanes to help bicycling become a more viable mode of transportation
What improvements would you like to be made to support walking and biking in Concord?	More Bike Lanes! No motorcycles allowed to park in downtown's bike rack areas. Sidewalks should be added to all residential areas with heavy foot traffic
What areas of the City would you like to see have more bike and pedestrian facilities?	Poplar Tent Road Silverhill (near Hartsell Rec. Center)
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Cabarrus to Branchview to Food Lion Shopping Center
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Michael Eudy
Address	118 Edgewood Ave. NE Concord, NC 28025 United States
Email	euryman@gmail.com
Phone Number	

Created 23 May 2018 2:48:34 PM	166.82.104.11 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #102

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Mostly walking, weekends on the greenways
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	yes, but only during daylight hours.
What improvements would you like to be made to support walking and biking in Concord?	Please be sure to check wooden slats on the greenway boardwalks that may need to be replaced
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Michelle Colombero
Address	85 Tarrymore Lane Concord, NC 28078 United States
Email	
Phone Number	(704) 960-0961

Created 23 May 2018 2:52:03 PM	166.82.104.11 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input #103

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	YES! I walk everyday from Edgewood Avenue to the Academy Center gym, to downtown and on pathways in and around the County. I bike into downtown and use a bike rack for storage. I bike to City Hall, the library, and coffee shop
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	WALKING-YES, BIKING-NOT SO MUCH. I do not bike much on roadways anymore because bike lanes tend to disappear on roads. I still bike on Union Street and some on Church Street. Motorcycles and motor bikes occasionally obstruct bike racks downtown.
What improvements would you like to be made to support walking and biking in Concord?	1) Crosswalk lights that do not allow turning traffic at the same time as pedestrians. 2) Any roadway expansions or improvements should have sidewalks and bike lanes built as part of the project; and 3) Enforce people parking half way on sidewalks
What areas of the City would you like to see have more bike and pedestrian facilities?	1) Union Street - Has PLENTY of room for bike lanes 2) Poplar Tent Road/McGill Avenue could use sidewalks. I see many pedestrians 3) Any new developments that connect with older sections of town
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Edgewood Avenue and Church Street
Name	
Address	
Email	
Phone Number	

Created 23 May 2018 3:01:45 PM	166.82.104.11 IP Address
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Concord Connectivity Analysis Community Input #104

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	I would like to make it a part of our routine, BUT it needs to be easily accessible for wheelchairs, not only for a smooth path, but also for ease of getting on and off the path or greenway. Also, parking closer to the entrances.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	I don't always feel safe, especially when alone
What improvements would you like to be made to support walking and biking in Concord?	I'm not sure if you have those blue emergency lights along the paths, but they would be comforting to know that you, at least have a chance to call for help
What areas of the City would you like to see have more bike and pedestrian facilities?	Burrage Road near the new Community Center that is being built there
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Burrage Road and Wilhelm
Name	
Address	
Email	
Phone Number	

Created 23 May 2018 3:08:39 PM	166.82.104.11 IP Address
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Concord Connectivity Analysis Community Input #105

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	No
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	Yes
What improvements would you like to be made to support walking and biking in Concord?	
What areas of the City would you like to see have more bike and pedestrian facilities?	
What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Burrage Road Rec. Center
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	Burrage Road
Name	
Address	
Email	
Phone Number	

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Loading comments ...

Concord Connectivity Analysis Community Input #106

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.	Yes! We ride bikes with our children and try to walk as many places as we possibly can. We take the greenway from McKee Park around downtown.
Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.	There are no sidewalks around my home (Hyde Park Drive NE), so I sometimes don't feel safe. In areas where there are sidewalks, I feel safe. Riding bikes I don't feel safe on the road unless I'm in the bike lane downtown. More bike lanes and sidewalks would vastly improve my feeling that my children and I are safe out in Concord!
What improvements would you like to be made to support walking and biking in Concord?	More sidewalks and bike lanes, expanded greenway!

What areas of the City would you like to see have more bike and pedestrian facilities?

I would like to see a bike lane on Church Street from downtown out to the transit center. Especially with the bus service into Charlotte and the extension of the Lynx, this would make sense. I would like there to be a sidewalk on Hyde Park Dr NE between Winecoff and Grandview. We'd then have sidewalk access to Beverly Hills Park. This would greatly improve safety for families on the Hillandale neighborhood trying to access that park, especially with the hills limiting visibility to vehicles. Beverly Hills Park is a beautiful park that is underutilized, I think due to insufficient safe pedestrian access.

What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?	Everywhere! We would use a Church street bike lane to access downtown almost daily (my kids attend school downtown and I work on Union St), Beverly Hills Park and any parks connected by greenways from my neighborhood (Hillandale).
If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.	
Name	Melissa Golder
Address	678 Hyde Park Dr NE Concord, NC 28025 United States
Email	melissakgolder@gmail.com
Phone Number	(920) 602-6543

Created 25 May 2018 1:13:22 PM	65.184.26.111 IP Address
PUBLIC	

Concord Connectivity Analysis Community Input

Please note, all fields are optional; you can provide a response to as many or as few of the questions as desired, including contact information.

Is walking and biking part of your routine? Please share how walking and biking fit into your activities.

My wife and I are walking more. We currently go to the park to have more area to walk.

Do you feel safe when you bike or walk in Concord? Please share your experiences or recommendations.

Yes, when I go to the park or in the neighborhood.

What improvements would you like to be made to support walking and biking in Concord?

I would like to see more Sidewalks.

What areas of the City would you like to see have more bike and pedestrian facilities?

George Liles Parkway.

What destinations or areas of the City would you walk or bike to if there were safe, accessible routes and connections?

George Liles Parkway

If you do not wish to provide your street address below, please indicate the major intersection closest to your place of residence.

Mountain Laurel Neighborhood

Name

David Harrison

First Last

Address

Street Address

Address Line 2

Concord

City

NC

State / Province / Region

28027

Postal / Zip Code

USA

Country

Email

Phone Number

334 - 220 - 5097

####

Feedback should be submitted by June 8th. Please drop off completed surveys to any City of Concord Recreation Center, the Cabarrus County Senior Center, or the City of Concord Housing Department or mail to:

Academy Recreation Center
ATTN: Jason Pauling
147 Academy Ave. NW
Concord, NC 28026

You may also access the survey online at www.concordnc.gov/Departments/Parks-Recreation.

COMMUNITY VALUES

WHICH VALUES ARE MOST IMPORTANT TO YOU?

- Mark the boxes that represent your most important values -

HEALTH + FITNESS I believe that personal health and fitness are important. Within your local bicycle and pedestrian system, you may seek out opportunities to run, jog, walk or bike, either self directed or with an organized group, or engage in other activities that contribute to overall health and fitness.	**THIS IS VERY IMPORTANT TO ME**
PEOPLE + COMMUNITY I believe that relationships and a sense of community and belonging are important. Within your local bicycle and pedestrian system, you may seek out opportunities to attend community events, gather with family and friends or register for group camps or activities.	**THIS IS VERY IMPORTANT TO ME**
ENVIRONMENT + NATURE I believe that preserving and engaging with the environment is important. Within your local bicycle and pedestrian system, you may seek out opportunities for nature walks that directly connect you with nature while preserving habitat and ecological functions.	**THIS IS VERY IMPORTANT TO ME**
HISTORY + CULTURE I believe that our history and our culture are important. Within your local bicycle and pedestrian system, you may seek out opportunities to visit historical sites, attend a cultural heritage event, or learn about history and culture through interpretive trails.	**THIS IS VERY IMPORTANT TO ME**
EDUCATION + LEARNING I believe that lifelong learning and teaching for people of all ages is important. Within your local bicycle and pedestrian system, you may seek out opportunities for learning about new things through your surroundings. You may prefer pedestrian routes that offer new activities and provide interpretive signage.	**THIS IS VERY IMPORTANT TO ME**

Concord NORTH CAROLINA High Performance Living

McAdams

CITY OF CONCORD PARKS + RECREATION CONNECTIVITY ANALYSIS

PUBLIC INPUT MEETING

PEDESTRIAN CONNECTIONS

HOW DO YOU OR WOULD YOU USE PEDESTRIAN CONNECTIONS AND WHAT IS YOUR PREFERRED FACILITY?

- Mark the images that represent how and where you use or would like to use pedestrian connections -

BIKE



GREENWAYS



WALK



SIDEWALKS | MULTI-USE PATHS



RUN



PROTECTED BIKE LANES



HIKE



BUFFERED BIKE LANES



OTHER



BIKE LANES



Most Protected

Least Protected

Concord NORTH CAROLINA High Performance Living

McAdams

CITY OF CONCORD PARKS + RECREATION CONNECTIVITY ANALYSIS

PUBLIC INPUT MEETING

PEDESTRIAN CONNECTIONS

WHY DO YOU OR WOULD YOU USE PEDESTRIAN CONNECTIONS?

- Mark the images that represent why you use or would like to use pedestrian connections -

CONNECT WITH NATURE



TAKE SHORT TRIPS | RUN ERRANDS



SPEND TIME WITH FAMILY



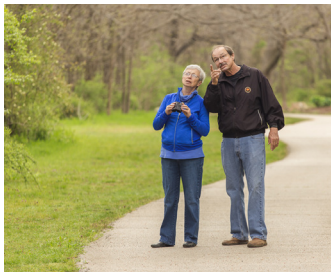
WALK A PET



IMPROVE HEALTH + FITNESS



SHOW VISITORS MY COMMUNITY



LEARN



RELIEVE STRESS



COMMUTE TO WORK



COMMUTE TO SCHOOL



Concord NORTH CAROLINA High Performance Living

McADAMS

CITY OF CONCORD PARKS + RECREATION CONNECTIVITY ANALYSIS

PUBLIC INPUT MEETING

Raleigh Parks, Recreation and Cultural Resources Department



NOVEMBER 4, 2014

BOND REFERENDUM

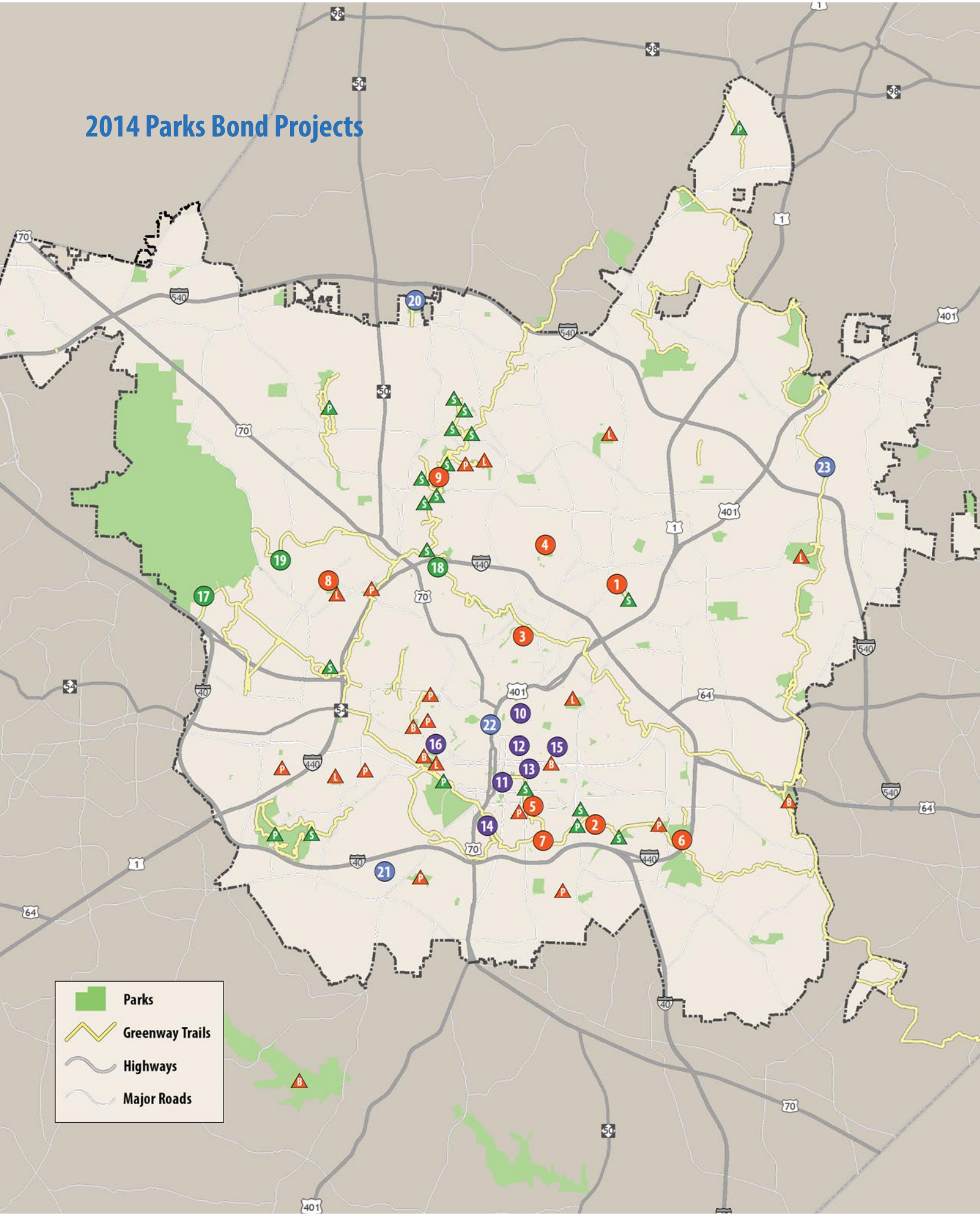
YOUR PARKS. YOUR FUTURE. YOUR BOND.

On November 4, 2014, Raleigh voters will be asked to consider a $91.775 million bond referendum for parks and recreational facilities.

Learn more

- Visit parks.raleighnc.gov
- For additional questions, contact Stephen Bentley at 919-996-4784 or Stephen.Bentley@raleighnc.gov

2014 Parks Bond Projects



PARK AND FACILITY IMPROVEMENT PROJECTS $41,425,000

1 Brentwood $2,000,000
Update the park master plan, neighborhood center renovations, site improvements may include accessibility, fields, courts, signage and playground.

2 Apollo Heights (Ralph Campbell) $600,000
Neighborhood Center renovations, site improvements may include accessibility, playground, shelter, lighting, etc.

3 Kiwanis $700,000
Neighborhood Center renovations, site improvements may include a new playground, comfort station, shelter improvements, etc.

4 Eastgate $600,000
Neighborhood Center renovations, site improvements may include accessibility, trails and walks, etc.

5 John Chavis Memorial Park Improvements $12,500,000
Phase 1 implementation of the newly adopted park master plan.

6 Walnut Creek Athletic Complex Improvements $5,000,000
Overall site and facility improvements that may include fence, drainage, lighting, utility infrastructure, site amenities, walks and tower renovations.

7 Walnut Creek Wetland Park Improvements $1,000,000
Complete a park master plan, implement boardwalk and interpretive opportunities for sustainable access to the wetland areas.

8 Laurel Hills Playground $1,000,000
Funding to partner with stakeholders on the implementation of the new accessible playground plan.

ADA Improvements $2,000,000
Upgrade existing park sites and facilities to current accessibility standards.

Aquatic Facility Improvements $8,000,000
Analysis of existing pools shells and address deferred maintenance.

B Building Systems $2,025,000
Upgrade heating, ventilation and air condition systems at existing park facilities.

L Lighting $4,000,000
Upgrade sport field and court lighting across the park system.

P Playgrounds $1,500,000
Upgrade/replace various playground locations across the City to meet national guidelines.

9 Shelley Lake Comfort Station $500,000
Design and build a new comfort station at Shelley Lake near the greenway.

CULTURAL RESOURCES PROJECTS $7,500,000

Historic Site Improvements $1,500,000
Improvements at Raleigh's Historic Sites and Cemeteries.

- 10 Mordecai Historic Park
- 11 Pope
- 12 Tucker House
- 13 City Cemetery
- 14 Mount Hope Cemetery
- 15 O'Rorke-Catholic Cemetery

16 Pullen Art Center Replacement $6,000,000
Design and build a new Pullen Art Center in partnership with NCSU Gregg Museum.

GREENWAY PROJECTS $15,600,000

Miscellaneous Greenway Improvements $7,200,000
Improvements to the existing greenway infrastructure.

S Structures and Bridges

P Paving

Neighborhood & Community Connections $1,000,000
Bike and pedestrian access improvements to/from various Greenways & Parks.

17 Trenton Road $1,000,000
Construction of a multi-purpose path on the west side of Trenton Road from the Reedy Creek Trail to I-40.

18 Crabtree Creek Greenway / Lassiter Mill Gap $2,000,000
Development of a continuous greenway trail connection from Herford Street extending to the east side of Lassiter Mill Road.

19 Crabtree Creek Connection to Umstead $4,400,000
Connecting Crabtree Creek Greenway from the Duraleigh area to Umstead State Park.

LAND ACQUISITION AND DEVELOPMENT $27,250,000

Land Acquisition $10,000,000
Acquire additional park property based on the recommendations from the new PRCR System Plan.

20 Baileywick Community Center $12,000,000
Design and build a new community center at Baileywick Park.

21 Sierra / Lineberry Park $1,250,000
Implement the new park master plan.

22 Capital Blvd Corridor Plan Implementation (Devereux Meadows Park) $2,000,000
Planning, design and phasing of the implementation of a new park in the Devereux Meadows area at the corner of Peace Street and Capital Blvd. Partnership with City Stormwater, Public Utilities and Transportation Planning.

23 Perry Creek (5401) New Park Development $2,000,000
A new neighborhood park, master plan and phase 1 implementation in partnership with a private developer and Wake County Public School System.



Parks Bond Projects

On May 6, 2014 the Raleigh City Council voted unanimously to approve a new Parks, Recreation and Cultural Resources System Plan. The System Plan process included over 16 months of public input from across Raleigh. The new Plan guides the development and delivery of the City's parks and recreation services, facilities and programs over the next 20 years. The projects in the 2014 Raleigh Parks Bond referendum reflect many of the highest priority needs identified in the System Plan including investing in the existing City of Raleigh's parks, recreation and cultural system. Additional projects focus on developing new facilities and opportunities that address future growth of the city and expanding needs and desires of residents.

If Approved by Voters

- **A 1.72-cent increase in Raleigh's property tax rate would go into effect July 1, 2015.**
  Example: Owner of a $150k home would pay about $25 more a year
  Owner of a $300k home would pay about $51 more a year
- **Projects will be implemented in phases over the next 5-7 years. The first phase of projects would begin Fall 2015**

Official Ballot Language to Appear on Nov. 4 Ballot

Shall the order adopted on July 15, 2014, authorizing not exceeding $91,775,000 PARKS AND RECREATIONAL FACILITIES BONDS of the City of Raleigh, North Carolina, plus interest, for the purpose of providing funds, together with any other available funds, for improving and expanding the existing parks and recreational facilities of said City and acquiring and constructing new parks and recreational facilities of said City, inside and outside the corporate limits of said City, including, without limitation, the acquisition of land and rights of way and the furnishing of incidental facilities and equipment, and providing that additional taxes may be levied in an amount sufficient to pay the principal of and interest on the bonds, be approved?

Want to schedule a presentation about the 2014 Raleigh Parks Bond? Email Marketing@raleighnc.gov

@raleighparks
pinterest.com/raleighparks
facebook.com/raleighparks

CITY OF WILMINGTON

2016 Parks Bond

CITY OF WILMINGTON PUBLIC INFORMATION REPORT

Fall 2016: Special Report

Information Meetings

Several meetings are being held to provide information about the 2016 Parks Bond. Residents who would like to learn about the proposed bond projects or ask questions are encouraged to attend one of the meetings. All the meetings will be informal drop-ins from 5-6:30 p.m. at the following locations:

October 4
Halyburton Park,
4099 S. 17th Street

October 5
Maides Park,
1101 Manly Avenue

October 6
MLK Center,
401 S. 8th Street







What & why

There will be a referendum on the Nov. 8 ballot for a $30.4 million bond for additional park facilities and improvements at existing facilities.

Highlights:

- Fifteen projects are proposed, including development of the city's northern waterfront park with a large concert venue, new soccer and multipurpose fields, expansion of Olsen Park, and safety improvements at existing parks.
- Residents want more parks. In the latest citizen survey and the recently completed comprehensive plan, citizens indicated that they want more parks and recreation opportunities.
- Parks and improvements funded by the 2006 parks bond are highly utilized, including the Gary Shell Cross-City Trail, Olsen Park and Althea Gibson Tennis Complex.
- **What would the bond cost?** While only $30.4 million is on the referendum, the city would leverage $7.6 million in planned funding from related projects to complete $38 million of projects.
- **What would it cost me?** The bond would be repaid by increasing the city's property tax rate by 2.1¢ per $100 of assessed valuation. For example, the homeowner of a $200,000 home would pay $42 more per year, or $3.50 per month.

Making progress on 2014 Transportation Bond Projects

Much progress has been made on the 38 projects in the Transportation Bond that was approved by Wilmington voters in 2014.

Projects slated to start by the end of the year include crosswalks at the Kerr/Wilshire and Kerr/College intersections, and sidewalks on McClelland Drive, Fairlawn Drive, Clover Road, Gleason Road and 23rd Street.

The crosswalks and sidewalks will provide much-needed safe pedestrian crossings at busy intersections and connect densely populated residential areas with commercial areas, allowing residents to walk/bike more safely instead of having to drive for shorter trips. All projects are expected to be completed within 5-7 years.









2006 Parks Bond Projects: Greenfield Lake Amphitheater expansion to seat 900 people, MLK Center improvements, Cross-City Trail expansion

CITY OF WILMINGTON | 2016 PARKS BOND PROPOSED PROJECTS

North Waterfront Park Site Development | $20,000,000
Project includes development of the 6.5-acre North Waterfront Park to include site preparation, lawns, stage and performance area, gardens, children's area, water feature, public art and support structures.

The development of this large urban park would serve all Wilmington residents and be similar to park investments made in other cities such as Asheville and Greenville that have been very successful. It is expected the performance area could accommodate up to 10,000 people.

Soccer & Multi-Purpose Fields | $10,000,000
Project includes property acquisition, site preparation and development of new soccer and multi-purpose fields and support structures.

Olsen Park Phase II Continuance | $2,000,000
The City has started Phase II with a volleyball court, landscaping and picnic areas. The funding would allow the city to further pursue Phase II to include a multipurpose field, tennis/pickle ball courts, additional parking, a maintenance structure and paths.

MLK Center Expansion & Improvements | $1,830,000
Project includes replacing the bleachers and floor at the MLK Center and renovating the entrance/lobby area as well as adding a new gymnasium/multi-purpose room.

Derick Davis Community Center Expansion | $1,580,000
Project will include the expansion of the Davis Center at Maides Park to include a new gymnasium/ multi-purpose room.

Municipal Golf Course | $1,000,000
Project includes improvements to the golf clubhouse and entrance.

Greenfield Park improvements | $500,000
Project includes the resurfacing of the trail that goes around Greenfield Lake, new fountain, irrigation and landscape lighting at the Fragrance Garden and bridge refurbishment.

Halyburton Park | $305,000
Project includes expanding the current maintenance building and playground, building interior boardwalk trails, upgrading the Visitor Center and replacing interpretive signage.

Bradley Creek Kayak/Canoe Launch | $220,000
Project includes kayak/canoe launch and parking.

Wade Park | $85,000
Improvements include additional playground equipment, new interpretive signage and demolition of original water treatment building.

Skate Park Office Replacement | $65,000
The skate park office is essentially a shed originally put in place as a temporary measure. A small building would be constructed and one half-pipe skating ramp replaced.

Security Upgrades | $50,000
Project includes security upgrades that would be made at various recreational facilities.

Althea Gibson Tennis Complex Resurfacing | $40,000
Project would resurface 11 of the tennis courts at the Althea Gibson Tennis Complex.

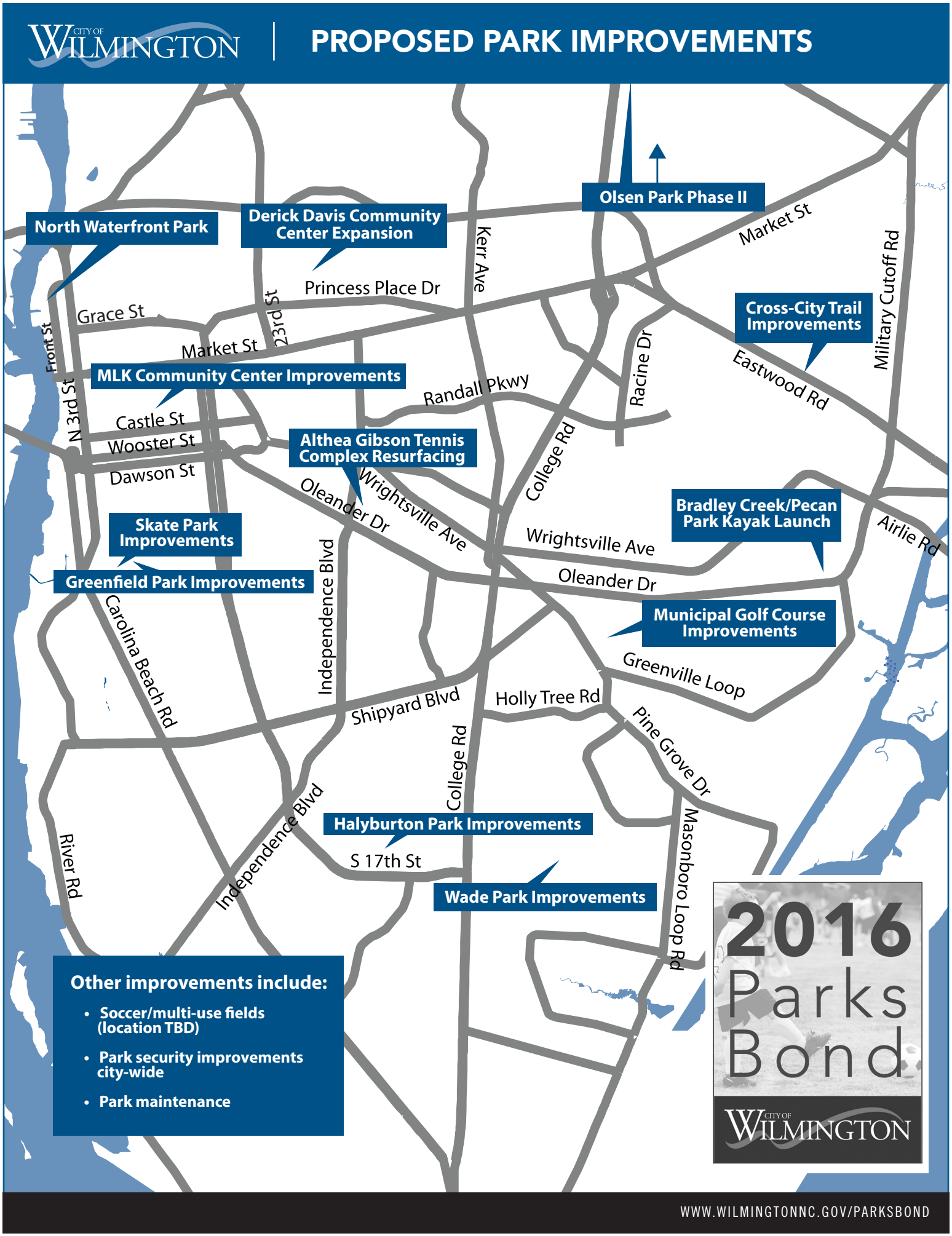
Resurface Parking Lots | $30,000
Project includes resurfacing of parking lots at Legion Sports Complex, Fit For Fun Center and the Boxing and Physical Fitness Center.

Cross City Trail | $25,000
Funds would be used to make landscaping improvements and install parking at Eastwood Road and Rogersville Road.








CITY OF WILMINGTON
PROPOSED PARK IMPROVEMENTS
North Waterfront Park
Derick Davis Community Center Expansion
Olsen Park Phase II
Cross-City Trail Improvements
MLK Community Center Improvements
Althea Gibson Tennis Complex Resurfacing
Bradley Creek/Pecan Park Kayak Launch
Skate Park Improvements
Greenfield Park Improvements
Municipal Golf Course Improvements
Halyburton Park Improvements
Wade Park Improvements
Princess Place Dr
Grace St
Market St
Front St
N 3rd St
23rd St
Kerr Ave
Racine Dr
Eastwood Rd
Military Cutoff Rd
Randall Pkwy
Castle St
Wooster St
Dawson St
College Rd
Oleander Dr
Wrightsville Ave
Airlie Rd
Carolina Beach Rd
Independence Blvd
Shipyard Blvd
Holly Tree Rd
Greenville Loop
Pine Grove Dr
S 17th St
River Rd
Masonboro Loop Rd
Other improvements include:
• Soccer/multi-use fields (location TBD)
• Park security improvements city-wide
• Park maintenance
2016 Parks Bond
CITY OF WILMINGTON
WWW.WILMINGTONNC.GOV/PARKSBOND

Make your voice heard
2016 General Election – November 8, 2016

Early (ONE-STOP) Voting

October 20 - November 5, 2016
(Except Sundays)

Locations

Government Center
Suite 34, 230 Government Center Drive

CFCC Health Sciences Building
Rooms L-112, L-110A, 415 N. 2nd Street

Northeast Regional Library
1241 Military Cutoff Road

NHC Senior Center
2222 S. College Road

Carolina Beach Town Hall
1121 N. Lake Park Boulevard

Dates and times (Except Sundays)

Thursday, October 20 to
Wednesday, November 2, 9am to 5pm

Thursday, November 3 to
Friday, November 4, 9am to 7pm

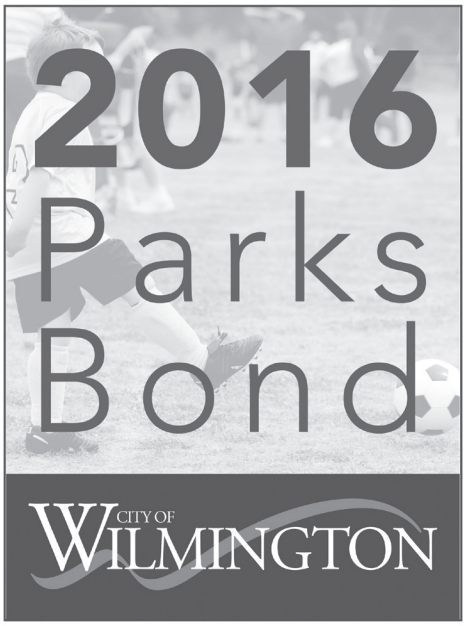
Saturday, November 5, 9am to 1pm

Election Day – Nov. 8

Polls open 6:30 am to 7:30 pm
Polling places & more information:

nhcvote.com

What will I see on the ballot?



Wilmington Parks and Recreation Bonds

SHALL the order authorizing $30,465,000 of bonds to pay the costs of acquiring, constructing, renovating, expanding and improving certain parks and recreational facilities, including, among other things, North Waterfront Park, athletic fields and tennis courts, community centers, a municipal golf course, trails, boardwalk and playgrounds; and providing related landscaping, lighting, building, sidewalk, parking and roadway improvements and the acquisition of land, rights-of-way and easements in land required therefor at parks and recreational facilities throughout the City, and providing that additional taxes may be levied in an amount sufficient to pay the principal and interest on the bonds be approved?

◯ YES ◯ NO

Highlights of recent ruling by 4th U.S. Circuit Court of Appeals on 2016 elections in NC:

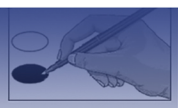
- There will be no photo ID requirement; However, new voters will be asked to list an ID number on their registration form – either their NC driver's license number or the last 4 digits of their Social Security number. If officials can't verify the number, or if the voter omits it, the voter will be asked at the polls to show a photo ID or one of these with their name and current address: a utility bill (electric, phone, water, or cable), pay stub, bank statement, or any document from any government agency.
- Same-day registration will be offered during early voting.
- One-stop early voting will be a 17-day period beginning Oct. 20th, and preregistration will be allowed.

Source: ncvoter.org

2018 WAKE COUNTY DEMOCRATS

SAMPLE BALLOT

A. With the marking device provided or a black ball point pen, completely fill in the oval to the left of each candidate or selection of your choice as shown.
B. Where authorized, you may write in a candidate by filling in the oval and writing the name on the Write-in line.
C. If you tear, deface or wrongly mark this ballot, return it to request a replacement.



FEDERAL OFFICES

US House of Representatives District 4
(You may vote for ONE)

- ○ Barbara Howe — Libertarian
- ○ Steve A. (Von) Loor — Republican
- ● David Price — Democrat

STATE OFFICES

NC State Senate District 15
(You may vote for ONE)

- ○ Brian Lewis — Libertarian
- ○ Alan David Michael — Republican
- ● Jay J. Chaudhuri — Democrat

NC House of Representatives District 49
(You may vote for ONE)

- ○ Jonathan Horst — Libertarian
- ○ David Robertson — Republican
- ● Cynthia Ball — Democrat

PROSECUTORIAL OFFICES

District Attorney District 11
(You may vote for ONE)

- ● Nancy (Lorrin) Freeman — Democrat
- ○ John Walter Bryant — Republican

COUNTY OFFICES

Board of Commissioners District 1
(You may vote for ONE)

- ● Sig Hutchinson — Democrat
- ○ Greg Jones — Republican
- ○ Tim Jowers — Libertarian

Board of Commissioners District 2
(You may vote for ONE)

- ○ Frann L. Sarpolus — Republican
- ● Matt Calabria — Democrat

Board of Commissioners District 3
(You may vote for ONE)

- ● Jessica Holmes — Democrat

Board of Commissioners District 4
(You may vote for ONE)

- ○ Kim Coley — Republican
- ● Susan P. Evans — Democrat

Board of Commissioners District 5
(You may vote for ONE)

- ● James West — Democrat

Board of Commissioners District 6
(You may vote for ONE)

- ● Greg Ford — Democrat
- ○ David Blackwelder — Republican

Board of Commissioners District 7
(You may vote for ONE)

- ○ Alex Moore — Republican
- ● Vickie Adamson — Democrat

Clerk of Superior Court
(You may vote for ONE)

- ○ Jennifer Knox — Republican
- ● Blair Williams — Democrat

Sheriff
(You may vote for ONE)

- ○ Donnie Harrison — Republican
- ● Gerald M. Baker — Democrat

JUDICIAL OFFICES

No primaries for judicial office were held in 2018. The information listed by each of the following candidates' names indicates only the candidates' party affiliation or unaffiliated status on their voter registration at the time they filed to run for office.

NC Supreme Court Associate Justice Seat 1
(You may vote for ONE)

- ○ Barbara Jackson — Republican
- ○ Christopher (Chris) Anglin — Republican
- ● Anita Earls — Democrat

NC Court of Appeals Judge Seat 1
(You may vote for ONE)

- ○ Andrew T. Heath — Republican
- ● John S. Arrowood — Democrat

NC Court of Appeals Judge Seat 2
(You may vote for ONE)

- ○ Jefferson G. Griffin — Republican
- ● Tobias (Toby) Hampson — Democrat
- ○ Sandra Alice Ray — Republican

NC Court of Appeals Judge Seat 3
(You may vote for ONE)

- ○ Chuck Kitchen — Republican
- ○ Michael Monaco, Sr. — Libertarian
- ● Allegra Katherine Collins — Democrat

NC District Court Judge District 10D Seat 1
(You may vote for ONE)

- ● Margaret Phillips Eagles — Democrat

NC District Court Judge District 10D Seat 2
(You may vote for ONE)

- ○ Nicolette Fulton — Unaffiliated
- ● Walter Rand — Democrat
- ○ J. Brian Ratledge — Republican
- ○ Evan Charles Schreier — Republican
- ○ Rebecca Anne Edwards — Democrat

NC District Court Judge District 10D Seat 3
(You may vote for ONE)

- ○ Ned W. Mangum — Republican

NONPARTISAN OFFICES

Board of Education District 6
(You may vote for ONE)

- ● Christine Kushner
- ○ Write-in _____

Soil and Water Conservation District Supervisor
(You may vote for TWO)

- ○ Jonathan Garza
- ○ Ian McMillan
- ● Jennifer (Jenna) Austin Wadsworth
- ○ David P. Adams
- ● Nervahna Crew
- ○ Write-in _____
- ○ Write-in _____

Continue voting next side ➡

A | B North Carolina | C Ballot Style G0001

-- VOTE BOTH SIDES --

PRECINCT 01-01

Brooks Avenue Church of Christ
700 Brooks Avenue
Raleigh, NC 27607

3 VOTING RULES TO LIVE BY

#1

Use this sample ballot to find out which candidate(s) are endorsed by the Wake County Democratic Party.

#2

If you think something is not right, call our Voter Protection Hotline at (252) 297-8683

#3

TURN YOUR BALLOT OVER!! Vote AGAINST the amendments - these proposed amendments are dishonest, misleading, or unnecessary, and pose a threat to the integrity of our constitution. We encourage voting AGAINST them all.

D | E | F

REFERENDA

Constitutional Amendment

Constitutional amendment protecting the right of the people to hunt, fish, and harvest wildlife.

- For
- **Against**

Constitutional Amendment

Constitutional amendment to strengthen protections for victims of crime; to establish certain absolute basic rights for victims; and to ensure the enforcement of these rights.

- For
- **Against**

Constitutional Amendment

Constitutional amendment to reduce the income tax rate in North Carolina to a maximum allowable rate of seven percent (7%).

- For
- **Against**

Constitutional Amendment

Constitutional amendment to require voters to provide photo identification before voting in person.

- For
- **Against**

Constitutional Amendment

Constitutional amendment to change the process for filling judicial vacancies that occur between judicial elections from a process in which the Governor has sole appointment power to a process in which the people of the State nominate individuals to fill vacancies by way of a commission comprised of appointees made by the judicial, executive, and legislative branches charged with making recommendations to the legislature as to which nominees are deemed qualified; then the legislature will recommend at least two nominees to the Governor via legislative action not subject to gubernatorial veto; and the Governor will appoint judges from among these nominees.

- For
- **Against**

Constitutional Amendment

Constitutional amendment to establish an eight-member Bipartisan Board of Ethics and Elections Enforcement in the Constitution to administer ethics and elections law.

- For
- **Against**

Wake County School Bonds

Shall the order adopted on August 6, 2018, authorizing SCHOOL BONDS of the County of Wake, North Carolina in an amount not to exceed $548,000,000 plus interest, for the purpose of providing funds to construct, renovate, expand, improve and equip school buildings and other school facilities, including associated real estate costs, and providing that additional taxes may be levied in an amount sufficient to pay the principal of and interest on the bonds be approved?

- **Yes**
- No

Wake County Community College Bonds

Shall the order adopted on August 6, 2018, authorizing COMMUNITY COLLEGE BONDS of the County of Wake, North Carolina in an amount not to exceed $349,000,000 plus interest, for the purpose of providing funds to construct, renovate, expand, improve and equip community college facilities for Wake Technical Community College, including associated real estate costs, and providing that additional taxes may be levied in an amount sufficient to pay the principal of and interest on the bonds be approved?

- **Yes**
- No

EXTRA TIP

The proposed bonds are good for our public schools, our community college, and our outdoor spaces and greenways. We encourage voting YES on them all!

Wake County Parks, Greenways, Recreation, and Open Space Bonds

Shall the order adopted on August 6, 2018, authorizing PARKS, GREENWAYS, RECREATION, AND OPEN SPACE BONDS of the County of Wake, North Carolina in an amount not to exceed $120,000,000 plus interest, for the purpose of providing funds for improving and expanding existing parks, greenways, and recreational facilities and acquiring and constructing new parks, greenways, and recreational facilities, including facilities developed jointly with other governmental entities, and including the acquisition of open space land and other land for recreational use, the acquisition of rights of way and the furnishing of incidental facilities and equipment in connection therewith, and providing that additional taxes may be levied in an amount sufficient to pay the principal of and interest on the bonds be approved?

- **Yes**
- No

End of Ballot

SAMPLE



JOIN US, AND HELP BUILD A BETTER WAKE COUNTY

VOLUNTEER TODAY

WAKEDEMS.ORG

FACEBOOK.COM/WAKEDEMS

919-828-5656

Paid for by the Wake County Democratic Party
Not authorized by any candidate or candidate's committee

		Greenway Facility Operations		Bicycle Facility Operations		Pedestrian Facility Operations	
		Current Efforts	**Recommendations**	**Current Efforts**	**Recommendations**	**Current Efforts**	**Recommendations**
Routine Operations Activities							
Systematic Risk Management Assessment	Schedule and document inspections	Inspections are conducted as general observations by the attending maintenance crew, while in the field conducting routine tasks	Designated person, such as Trails Director or Assistant Trails Director should conduct formal inspections of all facilities 2 times / year (in the early spring and early fall). Conduct quarterly inspections on facilities with heavier usage.	Inspections are conducted as general observations by the attending maintenance crew, while in the field conducting routine tasks	2 times / year (in the early spring and early fall)	Conducted by Field Operations Department as needed	2 times / year (in the early spring and early fall)
	Evaluate and remove all obstacles or objects that could impede facility usage	As needed	As needed	As needed	As needed	Conducted by Field Operations Department for repair of concrete; Property owners remove obstacles and objects	Develop a regular schedule for Field Operations Department to trim shrubbery and clear debris
	Implement a data base management system	Very up to date GIS data base exists and is managed by the Assistant Trails Director	Continue to maintain data base and keep it up to date	GIS database was developed as a part of this plan	MPO should maintain data base and keep it up to date	Sidewalk database is maintained by GDOT	MPO should maintain data base and keep it up to date
	Implement an emergency response protocol	911 emergency response system already in place, Addresses exist for each trail, Access roadways have been established (Owl's Roost Fire Lanes)	Evaluate emergency response system regularly to ensure timely response	911 Emergency Response System already in place	Continue current protocol	911 Emergency Response System already in place	Continue current protocol
Inter-Departmental Design Review	Identify an entity to provide on-going oversight, coordination, and leadership for the overall network	Currently, Greenway, Bicycle, and Pedestrian Systems are not well integrated	Create an Inter-Departmental Committee	Currently, Greenway, Bicycle, and Pedestrian Systems are not well integrated	Create an Inter-Departmental Committee	Currently, Greenway, Bicycle, and Pedestrian Systems are not well integrated	Create an Inter-Departmental Committee
	Review critical public and private sector projects that might impact the greenway, bicycle, and pedestrian projects as they come on-line	Internal review of projects is done by the Trails Department	Review as part of the Inter-Departmental Coordinating Committee	Internal review is currently done by GDOT	Review as part of the Inter-Departmental Coordinating Committee Review designs for all facilities that allow bicycle usage to eliminate unsafe drainage grates, railroad crossings, etc.	Internal review is currently done by GDOT	Review as part of the Inter-Departmental Coordinating Committee
	Pursue grants and cooperative agreements	Assistant Trails Director-pursues grants. More sources of funding are needed.	Hire another Assistant Trails Director and reassign responsibilities according to Organizational Model	Currently done by GDOT	Make this a responsibility for the future Bicycle Coordinator	Currently done by GDOT	Make this a responsibility for the future Pedestrian Coordinator
	Monitor operations and maintenance and other advocacy functions now and over the years to come	Trails Director-Overall monitoring, but not enough support staff to carry out the needed tasks in a timely manner	Hire staff to support existing greenway system and hire more staff as needed (one crew person for every 16 miles of trails maintained)	Not currently done and no performance measures exist	Make this a responsibility for the future Bicycle Coordinator	Not currently done and no performance measures exist	Make this a responsibility for the future Pedestrian Coordinator
	Review accident and crime reports and take the necessary up-front actions, on a case by case basis	Trails Director-The few serious incidents that have occurred, were recorded and filed. Incidents such as graffiti and dog bites are observed and addressed. Legal action would be taken if needed, but generally is not.	Incidents should be recorded digitally and the information should be shared with the Inter-Departmental Committee	Bicycle crash data is reviewed by GDOT on a regular basis	Continue to review bicycle crash data and expand analysis to the entire MPO	Pedestrian crash data is reviewed by GDOT on a regular basis	Continue to review pedestrian crash data and expand analysis to the entire MPO

Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Table 6(a)

Network Routine and Remedial Operations







		Greenway Facility Operations		Bicycle Facility Operations		Pedestrian Facility Operations	
Accurate and Organized Record Keeping	Daily Activities	No accurate log of daily activities-not enough employees to do record keeping	Hire another Assistant Trails Director and reassign responsibilities according to the Organizational model	No accurate log of daily activities-not enough employees to do record keeping	Make this a responsibility for the future Bicycle Coordinator	No accurate log of daily activities-not enough employees to do record keeping	Make this a responsibility for the future Pedestrian Coordinator
	Schedule of Routine and Remedial Maintenance Tasks	No accurate log of routine and remedial maintenance tasks-not enough employees to do record keeping	Regularly schedule maintenance tasks and post schedule to alert users of potential conflicts	No accurate log of routine and remedial maintenance tasks-not enough employees to do record keeping	Regularly schedule maintenance tasks and post schedule to alert users of potential conflicts	No accurate log of routine and remedial maintenance tasks-not enough employees to do record keeping	Regularly schedule maintenance tasks and post schedule to alert users of potential conflicts
	Hazards, Incidents, Safety Issues Observed and Actions Taken	Trails Director-The few serious incidents that have occurred, were recorded and filed away. Incidents such as graffiti are observed and addressed. Legal action would be taken if needed, but generally is not.	Continue to record and file all incidents and share with the Inter-Departmental Committee	Currently, GDOT reviews bike crashes	MPO should offer a maintenance hotline and website to report incidents and provide maintenance requests	Currently, GDOT reviews pedestrian crashes	MPO should offer a maintenance hotline and website to report incidents and provide maintenance requests
	Inspection Reports	No inspection reports are completed. Generally, if repairs need to be made, they are noted by the field crew and repaired or reported to the Trails Director	Complete inspection reports for greenway facilities twice a year	Currently, inspections are conducted as general observations by the Field Operations Department, while in the field conducting routine tasks	Complete inspection reports for greenway facilities twice a year	Currently, inspections are conducted as general observations by the Field Operations Department, while in the field conducting routine tasks	Complete inspection reports for greenway facilities twice a year
	Annual Maintenance Budget, pursuing various funding sources	Trails Director-An annual budget is prepared by the Trails Department to maximize the limited funds available.	Hire another Assistant Trails Director and reassign responsibilities according to the Organizational model. Focus on identifying and investigating alternative funding sources	GDOT works with other City agencies to prepare the annual maintenance budget	The future Bicycle Coordinator should be responsible for the annual maintenance budget including volunteer work, grant applications, and city funds	GDOT works with other City agencies to prepare the annual maintenance budget	The future Pedestrian Coordinator should be responsible for the annual maintenance budget including volunteer work, grant applications, and city funds
	Projected costs for subsequent years	Repairs or replacements are made when absolutely necessary and not by the lifespan estimate of each facility	Continue to maximize the lifespan/usage of each facility, but schedule repair/replacement costs and labor into the budget and work schedule for the estimated time span for each facility	Repairs or replacements are made when absolutely necessary and not by the lifespan estimate of each facility	Continue to maximize the lifespan/usage of each facility, but schedule repair/replacement costs and labor into the budget and work schedule for the estimated time span for each facility	Repairs or replacements are made when absolutely necessary and not by the lifespan estimate of each facility	Continue to maximize the lifespan/usage of each facility, but schedule repair/replacement costs and labor into the budget and work schedule for the estimated time span for each facility
	Internal working data base for existing, planned, and proposed projects	Assistant Trails Director-GIS is utilized to keep up to date records of all trail facilities and to produce maps for users	Update GIS database as new facilities are implemented	GIS database was developed for this plan	Continue to include future plans and programmed facilities in the data base	GIS database was developed for this plan	Continue to include future plans and programmed facilities in the data base and expand the database to include the entire MPO area
Remedial Operations Activities							
Program Development	Update informational and directional signage to integrate greenway, bicycle, and pedestrian systems and to communicate proper usage of all network facilities	Informational signage is in good condition and reflects the current rules and regulations for facility usage; Directional signage to include bicycle and pedestrian systems and nearby trip attractors is needed	Sustain the quality and condition of greenway informational signage; Update directional signage to include bicycle and pedestrian facility connections, trip attractors, etc.	Bicycle Route signage exists in the City of Greensboro but is outdated	Remove and replace signage with new (See Chapter 4)	Some existing pedestrian way finding signs in downtown Greensboro and in college areas	Provide more pedestrian wayfinding signage and coordinate with GTA and bicycle system signage
	Update user maps to reflect any additions or changes to the systems or overall network and also reference the connections between each system	Existing trail maps are great resources. However, reference to the bicycle and pedestrian systems should be included	When maps are updated to reflect new greenway facilities, reference the connections between the overall network	Existing Greensboro bicycle map is outdated	Publish and distribute the new bicycle map that has been created as part of this plan; Have new bicycle coordinator update the bicycle map every 3-5 years	No maps specific to pedestrian, but pedestrians often use the GTA maps	Consider developing maps of walking routes; Assistant Pedestrian Coordinator should coordinate pedestrian maps with bicycle and GTA maps
General Operations	Provide contact information and institute an agency response for facility users to report questions, comments, concerns, or complaints	Trail maps give the Assistant Trails Director as a contact, although many people call the main line or the Courthouse	Hire another Assistant Trails Director and redistribute tasks to provide timely response to questions, comments, etc. from public	MPO staff responds to citizen calls	Have the new Assistant Bicycle Coordinator address concerns raised through the hotline and website	MPO staff responds to citizen calls	Have the new Assistant Pedestrian Coordinator address concerns raised through the hotline and website
	Continue to provide and establish new public education and citizen participation programs for network users	The Trails Department has numerous environmental and educational programs. (See Chapter 5: Program and Policy)	Hire another Assistant Trails Director and redistribute tasks to provide more time for education and outreach	The City of Greensboro has existing educational and environmental programs (See Chapter 5)	Assistant bicycle coordinator should lead these education, enforcement, and encouragement efforts	The City of Greensboro has existing educational and environmental programs (See Chapter 5)	Assistant pedestrian coordinator should lead these education, enforcement, and encouragement efforts
	Pursue development of an easy to use management manual and training program and incorporate it into existing and new maintenance programs and procedures	No formal training for employees is required besides a City of Greensboro employee introduction session	Create a manual for all employees emphasizing their role as representatives of the greenway system and outlining responsibilities for each position	GDOT provides some bicycle facility planning and design training to the staff	Greensboro MPO should provide more training on bicycle issues; Bicycle coordinator should lead the training effort	GDOT provides some pedestrian facility planning and design training to the staff	Greensboro MPO should provide more training on pedestrian issues; Pedestrian coordinator should lead the training effort

Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Table 6(a)

Network Routine and Remedial Operations







Operations 2 of 2

Greenway Facility Types

		Current Efforts	Type I: No Facility Development[1]	Type II: Limited Development[1]	Type III: Multi-use Unpaved Trail[1]	Type IV: Multi-use Paved Trail[1]	Type V: On Road Facilities[1]	Type VI: Water-based Trails/ Natural Stream Corridors[1]	Recommendations
Routine Maintenance Activities									
Facility Maintenance	Sweeping	As Needed	N/A	N/A	Boardwalks and Bridges 2 times / year	2 times / year	Refer to Bicycle and Pedestrian Routine and Remedial Maintenance	N/A	Paved facilities will be swept by machine or spot sweeping of bad areas will be swept by hand or with blowers. Some trails require a combination of methods. Transition areas between unpaved and paved facilities will require extra attention to remove potentially hazardous debris from the paved surfaces.
	Trash Removal	As needed	1-2 times / year	2-4 times / year	6 times / year	6 times / year	Sidepaths 6 times / year or Refer to Bicycle and Pedestrian Routine and Remedial Maintenance	1-2 times / year	This includes removing ground debris. Volunteers should be utilized for this task, such as Adopt-a-trail programs.
Vegetation Management	Tree and Shrub Trimming and Pruning	As Needed	N/A	Spring and Fall and as needed, such as after a storm to maintain 8' high and 6'-8' wide clearance	Spring and Fall and as needed, such as after a storm to maintain 8' high (12' high for equestrian) and 12'-14' wide clearance	Spring and Fall and as needed, such as after a storm to maintain 10' high (12' high for equestrian) and 12'-14' wide clearance	Spring and Fall and as needed, such as after a storm to maintain 10' high and 2'-14' wide clearance (depending on the facility type)	N/A	Tree and shrub trimming and pruning should be performed to the City's specifications and should be scheduled according to species type. This service will be performed for the safety of trail users, to maintain safe use of all facilities, without physical obstacles, such as low hanging tree limbs and visual obstructions, such as limited line of sight.
	Mowing of Vegetation	As Needed	N/A	N/A	30 times / year	30 times / year	30 times / year	N/A	Vegetation along trail corridors should be mowed on a regularly scheduled basis.
	Mulching and Edging	N/A-mulching As Needed-Edging	N/A	once/year or as needed	once / year or as needed	N/A	N/A	N/A	Type II and II Greenways may require mulch in some areas to maintain a useable trail surface. Edging to prevent encroachment of grass. vegetation on trail is also needed.
	Invasive Species Control	As Needed	As needed to reduce the spread of invasive species	once / year and as needed in problem areas	once / year and as needed in problem areas	once / year and as needed in problem areas	As scheduled by Public Works for routine maintenance of adjacent roadway	As needed to reduce the spread of invasive species	Vegetation, weed and pest management plans should be put into place to control invasive species and protect endangered plant and animal species and preserve wetlands, riparian buffers, and other resources of special natural, cultural or urban infrastructure value.
Remedial Maintenance Activities									
Facility Repair or Replacement	Replenish gravel, mulch, or other surface materials	As Needed	N/A	once / year and as needed	once / year and as needed	N/A	N/A	N/A	Loose stone or gravel has a lifespan of approximately 7-10 years and mulch, 1-3 years however water, wind, and excessive use may displace the materials, requiring a yearly assessment and replenishment of the surface
	Repaint/Restrip/Stain	As needed	N/A	N/A	N/A	2-4 years	2-4 years	N/A	
	Replace asphalt or concrete	As needed and when the budget allows	N/A	N/A	N/A	10-12 years	10-12 years	N/A	Concrete has a lifespan of approximately 20 years
	Remove encroaching debris along paved trail/ sidewalk edges	As needed	N/A	As needed	As needed	As needed	Edging-As needed	Edging-As needed	

*All greenway routine and remedial maintenance tasks should be performed by the Park and Recreation Department Trails Division Maintenance Crew unless otherwise noted.

Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Table 6(b)

Greenway Routine and Remedial Maintenance



Greenway Facility Types

		Current Efforts	Type I: No Facility Development[1]	Type II: Limited Development[1]	Type III: Multi-use Unpaved Trail[1]	Type IV: Multi-use Paved Trail[1]	Type V: On Road Facilities[1]	Type VI: Water-based Trails/ Natural Stream Corridors[1]	Recommendations
Facility Repair or Replacement	Regrade to prevent or eliminate low spots and drainage issues	As needed	N/A	Only if absolutely necessary	As needed	As needed	Responsibility of Field Operations as part of remedial maintenance of the adjacent roadway	N/A	
	Addition or repair of culverts, bridges, boardwalks, retaining walls, etc. to prevent or eliminate drainage/ erosion issues	As needed and when the budget allows	N/A	N/A	As needed, refer to Table 6(d)	As needed, refer to Table 6(d)	As needed, refer to Table 6(d)	N/A	
	Reroute trail, if necessary, to avoid environmentally sensitive or overused areas , safety issues, or construction projects	Done if necessary, however other alternatives are also explored	N/A	As needed	As needed	As needed	Responsibility of Field Operations with input from GDOT to reroute bicycle and pedestrian facilities if the adjacent roadway is rerouted or closed	N/A	
Seasonal Maintenance	Remove leaf litter	As needed	N/A	N/A	As needed on bridges and boardwalks	As needed	As needed by Trails Division for sidepaths. Refer to Bicycle and Pedestrian Remedial Maintenance for on-road facilities	N/A	Prioritize removal by the most heavily used facilities and geographic location. Limited development trails should be emphasized as natural environments and warnings should be posted that hazardous conditions may exist with the changing seasons.
	Remove snow and ice	As needed	N/A	N/A	As needed on bridges and boardwalks	As needed	As needed by Trails Division for sidepaths. Refer to Bicycle and Pedestrian Remedial Maintenance for on-road facilities	N/A	Prioritize removal by the most heavily used facilities, such as commuter routes, and geographic location. Limited development trails should be emphasized as natural environments and warnings should be posted that hazardous conditions may exist with the changing seasons.
Habitat Enhancement and Control	Plant vegetation, such as trees and shrubs	When the budget allows	Annual-Purchase of plant materials should be part of the annual budget to reintroduce native plant species	As needed to prevent erosion and introduce native plant materials into the landscape	As needed to prevent erosion or as landscape features during the installation of a trail	As needed to prevent erosion or as landscape features during the installation of a trail	Responsibility of Field Operations and as part of the Street tree Enhancement Program	Annual-Purchase of plant materials should be part of the annual budget to reintroduce native plant species	
	Take preventative measures to protect the landscape from the wildlife	As needed	As needed	As needed	As needed	As needed	As needed	As needed	
	Apply herbicide to eliminate any problem areas	As needed	As needed to discourage growth of invasive or problem species, such as poison ivy, kudzu	As needed to discourage growth of invasive or problem species, such as poison ivy, kudzu	As needed to discourage growth of invasive or problem species, such as poison ivy, kudzu	As needed to discourage growth of invasive or problem species, such as poison ivy, kudzu	As needed to discourage growth of invasive or problem species, such as poison ivy, kudzu	As needed to discourage growth of invasive or problem species, such as poison ivy, kudzu	
	Apply herbicide to maintain edges and prevent encroaching vegetation, such as along trails and sidewalks	As needed	N/A	N/A	As needed	As needed	As needed	N/A	

*All greenway routine and remedial maintenance tasks should be performed by the Park and Recreation Department Trails Division Maintenance Crew unless otherwise noted.

Greensboro Urban Area

Comprehensive Bicycle, Pedestrian, and Greenway Plan

Table 6(b)

Greenway Routine and Remedial Maintenance







Chapter 6: Operations and Maintenance

6.1 Operations and Maintenance

Operations and maintenance refers to specific day-to-day tasks and programs performed to assure resources and facilities are kept in good usable condition. This begins with sound design, durable components, and a comprehensive management plan. A management plan should be embraced by the entities responsible for maintaining the greenway, bicycle, and pedestrian network, at the beginning of the implementation process. In addition, community groups, residents, business owners, developers and other stakeholders should be engaged in the long term stewardship of the resources preserved and enhanced by this plan as discussed later in this chapter.

6.1.1 Guiding Principles for Effective Operations and Maintenance

The Greensboro Bicycle, Pedestrian and Greenway system should be viewed and maintained as a public resource. Indeed it will become infrastructure similar to the street system or utility networks, serving the community for generations to come. The following guiding principles will help assure the preservation of a first class system:

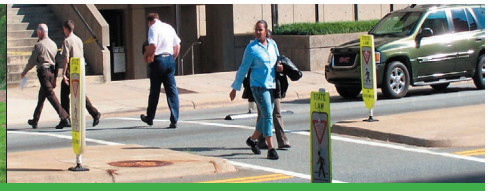
- Good maintenance begins with sound planning and design
- Foremost, protect life, property and the environment
- Promote and maintain a quality outdoor recreation and transportation experience
- Develop a management plan that is reviewed and updated annually with tasks, operational policies, standards, and routine and remedial maintenance goals
- Maintain quality control and conduct regular inspections
- Include field crews, police and fire/rescue personnel in both the design review and on-going management process
- Maintain an effective, responsive public feedback system and promote public participation
- Be a good neighbor to adjacent properties
- Operate a cost-effective program with sustainable funding sources

6.1.2 Resource Stewardship and Enhancement

A well-managed bicycle, pedestrian, and greenway system is critical to the long-term success of this Plan. This includes stewardship, the oversight of resources, and operations and maintenance. This includes such activities as monitoring the condition of bicycle, pedestrian, greenway, and ancillary facilities; monitoring the impact of growth on bicycle, pedestrian, and greenway facilities; and long-term application of policies—such as land-use and development measures—in accordance with the objectives of this plan. Stewardship might range from cleaning up litter to assuring that a project does not visually scar the surrounding landscape.

The stewardship process must consider both private sector—such as land subdivision and development—and public sector activities—such as the construction of roads and utilities. In pursuit of this, coordination among agencies at the local, regional, state and federal level is vital to assure that these activities are supportive of the plan and complementary to each other. Long term stewardship also calls for the enduring commitment of agency staff, elected officials and concerned citizens all working together. This suggests the need for a shared community vision and value system centered





on the protection of bicycle, pedestrian, greenway and outdoor recreational resources. This plan and similar plans can help coordinate and guide that action.

6.2 Routine and Remedial Operations

The following task lists describe the general routine and remedial operations responsibilities for all network facilities. To complement this text, Table 6(a) illustrates current operations and provides recommendations for improvement.

6.2.1 Routine Operations Defined

Routine operations refer to the daily activities required to oversee a greenway, bicycle, or pedestrian system.

Task: Systematic risk management assessment

Safety is central to all maintenance operations, and is the single most important trail, bicycle, and pedestrian facility maintenance concern. The City of Greensboro should implement a safety program that includes the following preventative measures.

- Schedule and document inspections to determine the amount of use, location, age, type of construction, and condition of railings, bridges, trail surfaces, signage, etc. Follow-up with the appropriate corrective measures in a timely manner.
- Evaluate and remove all obstacles or objects that could impede facility usage such as debris, rumble strips, etc. and provide solutions such as alternative routing, removal of obstacle, etc.
- Implement a data base management system, a Crime Tracking System, with police for tracking the specific locations and circumstances of all incidents, such as vandalism, and create a safety follow-up task force to address any problems that develop.
- Implement an emergency response protocol working with law enforcement, EMS agencies, and fire department that includes mapping of access points, design of trails and access roads (to accommodate up to 6.5 tons), and an “address system” such as mile markers to identify locations for all off-road greenway facilities. On-road facilities should make use of the existing street names and adjacent property addresses. Where appropriate, 911 emergency phones should be installed in remote areas. Each local emergency response office/unit should have an up-to-date map of all City greenway, bicycle, and pedestrian facilities.

Task: Inter-agency design review

Coordination between and commitment of agencies responsible for trail, bicycle, and pedestrian facilities is crucial to complete the following routine maintenance tasks. In addition to department managers, planners, designers and engineers, police and fire/rescue and field maintenance personnel should be consulted in the design and review process. The creation of a Citizens Advisory Committee and Technical Work Group is recommended to carry out the following tasks.

- Establish a coordinating committee with representatives from each of the participating agencies and stakeholders
- Identify an entity to provide on-going oversight, coordination, and leadership for the overall network
- Review critical public and private sector projects that might impact the greenway, bicycle, and pedestrian projects as they come on line
- Pursue grants and cooperative agreements
- Monitor operations and maintenance and other advocacy functions now and over the years to come.
- Review accident and crime reports and take the necessary up-front actions, on a case by case basis, to assure that greenway, bicycle,





and pedestrian facilities do not deteriorate due to safety concerns, crime, or from fear of criminal activity

Task: Accurate and Organized Record Keeping

Good record-keeping techniques are essential to a comprehensive operations and maintenance program, particularly when multiple systems are involved. This information can be used to eliminate overlap or gaps in maintenance services provided, identify levels of use, and prioritize management needs.

- Daily activities
- Schedule of routine (and remedial) maintenance tasks
- Hazards, incidents, safety issues observed and action taken
- Inspection reports
- Annual maintenance budget, pursuing various funding sources
- Projected costs for subsequent years (short-term, medium term, and long-term to reflect on project prioritization as shown in Chapter 6: Prioritization of Projects
- Internal working database for existing, planned, or proposed projects for each system - greenway, bicycle, and pedestrian

6.2.2 Remedial Operations Defined

Remedial operations refer to activities required to sustain the quality of the greenway, bicycle, and pedestrian systems.

Task: Program Development

- Update informational signage (rules and regulations) to communicate proper usage of all network facility types
- Update directional signage to integrate greenway, bicycle, and pedestrian systems and as new projects are implemented
- Update user maps to reflect any additions or changes to the systems or overall network and also reference the connections between greenway, bicycle, and pedestrian facilities

Task: General Operations

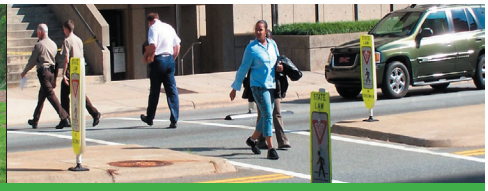
- Provide contact information and institute an agency response for facility users to report questions, comments, concerns, or complaints regarding the network, and a feedback phone number and Web address
- Continue to provide and establish new public education and citizen participation programs for network users - See Chapter 5: Education, Encouragement, and Enforcement
- Pursue development of an easy to use management manual and training program and incorporate it into existing and new maintenance programs and procedures within the participating agencies

6.3 Routine and Remedial Maintenance

The following task lists describe the general routine and remedial maintenance responsibilities for all network facilities. To complement this text, Tables 6(b) and 6(c) illustrate current maintenance efforts and provide recommendations for improvement.

Table 6(c) below lays out maintenance tasks for facilities such as pedestrian signals, crosswalks, bicycle lanes, and roadway shoulders. These types of pedestrian and bicycle facilities are provided within the roadway right-of-way and should be maintained by either the North Carolina Department of Transportation (NCDOT) or the City of Greensboro. A Greensboro MPO staff member should be designated as the main contact for the maintenance of pedestrian and bicycle facilities in the roadway right-of-way. This staff member should coordinate with the appropriate departments (such as the City of Greensboro Field Operations Program or NCDOT Division Seven Maintenance Program) to





conduct maintenance activities in the field. Funding for an ongoing maintenance program should be included in the County's operating budget or Capital Improvements Program.

Note that the schedule is intended to provide general guidance for routine and remedial maintenance activities. The frequency of pedestrian and bicycle facility maintenance within the roadway right-of-way will vary. Maintenance needs will depend upon many factors, including pavement surface type, the use of paint or thermoplastic for markings, and traffic volumes. The City of Greensboro and NCDOT should make immediate repairs to any pedestrian and bicycle facilities that are damaged or have hazardous conditions. The Greensboro MPO staff member in charge of maintenance should set up a free maintenance hotline for people to provide information about spot maintenance needs in the urban area.

Maintenance of Pedestrian and Bicycle Facilities Within Roadway Rights-of-Way
City of Greensboro & North Carolina DOT

Task	Frequency	Comments
Regular inspection	2 times per year	Includes all on-road bikeways, identify needed repairs of pavement signs, markings, etc
Shoulder and bike lane sweeping	2 times per year	All roadways with bicycle facilities
Shoulder and bike lane repairs	As needed	Repair of road surface, including potholes, cracks, or other problems on bicycle facilities
Median island and curb extension repairs	As needed	Repair of curb and gutters, removal of debris
Shoulder and bike lane resurfacing	During regular roadway repaving	Ensure that pavement width is maintained or increased during repaving projects
Debris removal from shoulders	As needed	Remove debris from roadway shoulders and bike lanes such as limbs, silt, and broken glass
Snow and ice removal	As needed	Plow snow off of roadway shoulders and bike lanes, and require property owners to shovel sidewalks
Pedestrian signals	As needed	Replace burned out or broken pedestrian signal heads; adjust pedestrian signal timing to accommodate MUTCD standard pedestrian walking speed
Signs and markings	As needed	Repair or replace pedestrian and bicycle warning signs, bicycle route signs, crosswalk markings, bicycle lane markings, and any other similar facilities identified during inspections
Vegetation control	During regular roadway maintenance	Mow grass and trim limbs and shrubs 2 feet back from sidewalk edge
Litter removal	6 times per year	Could be done with volunteers

Table 6(c). Maintenance schedule for on-road pedestrian and bicycle facilities.





6.3.1 Routine Maintenance Defined

Routine maintenance refers to the day-to-day regimen of litter pick-up, trash and debris removal, weed and dust control, trail sweeping, sign replacement, tree and shrub trimming, and other regularly scheduled activities. Routine maintenance also includes minor repairs and replacements such as fixing cracks and potholes or repairing a broken hand railing.

The following tasks should be performed on a regular basis to keep all network facilities in good, useable condition. Maintenance tasks should be conducted more frequently for greenway, bike, and pedestrian facilities where use is the most concentrated. Currently, the trails division of the Park and Recreation Department is researching the use of their popular trails with trail counters. Methods such as pedestrian and bicycle counts, sketch plan analysis methods for estimating pedestrian and bicycle demand, public survey results, and public meeting comments, such as the results found in Appendix B, can be used to determine which resources are the most heavily used and may require the most maintenance attention. The frequency of required maintenance tasks should be established as new facilities are implemented and should be reviewed and updated annually to reflect any changes in usage, safety issues, etc.

Task: Facility Maintenance

Basic housekeeping of greenway, bicycle, and pedestrian facilities will ensure that the network is clean and functional and will also improve the life of each facility. Volunteer efforts, such as those performed by the Greensboro Velo Club, Fat Tire Society, Piedmont Hiking and Outing Club, Bill Craft's Crafty Cruisers, and other volunteer groups, should be utilized in the performance of this maintenance task.

- Sweeping
- Trash removal

Task: Vegetation Management

To maintain a high quality network, regular attention should be given to the surrounding landscape, both natural and man-made. This not only improves the aesthetic quality of the network but also improves the users' sense of safety, as well.



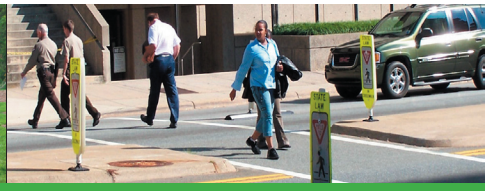
Figure 6(a). Vegetation management and aesthetic improvements can be carried out by volunteers in a variety of locations, here along a roadway.

- Tree and shrub trimming and pruning
- Mowing of vegetation
- Mulching and edging
- Invasive species control

6.3.2 Remedial Maintenance Defined

Remedial Maintenance refers to correcting significant defects in the network, as well as repairing, replacing or restoring major components that have been destroyed, damaged, or significantly deteriorated from normal usage and old age. Some items ("minor repairs") may occur on a five to ten year cycle such as repainting, seal coating asphalt pavement or replacing signage. Major reconstruction items will occur over a longer period or after an event such as a flood. Examples of major reconstruction remedial maintenance include stabilization of a severely eroded hillside, repaving a trail surface or a street used for biking, or replacing a





footbridge. Remedial maintenance should be part of a long-term capital improvement plan.

The following tasks should be performed on an as needed basis to keep network facilities in good, useable condition. Table 6(d) depicts the average life of each facility type, as well as general ancillary facilities, with normal wear and tear. The repair or replacement of existing facilities should be reflected in a projected budget for future maintenance costs.

Longevity of Facilities	
Mulch	2-3 years
Granular stone	7-10 years
Asphalt	7-15 years
Concrete	20 + years
Boardwalk	20 + years
Bridge/Underpass/ Tunnel	100 + years

Table 6(d). Approximate longevity of facility types and materials.

Task: Facility Repair or Replacement

All facilities will require repair or replacement at one time or another. The time between observation and repair/replacement will depend on whether the needed repair is deemed a hazard, to what degree the needed repair will affect the safety of the user, and whether the needed repair can be performed by an in-house maintenance crew or if it is so extensive that the needed repair must be done by outside entities or replaced completely. Some repairs are minor, such as repainting or resurfacing bicycle lanes and can be done in conjunction with other capital projects, such as repaving the adjacent street.

- Replenish gravel, mulch, or other materials
- Repaint/restrip/stain
- Repave/seal
- Replace asphalt or concrete
- Remove encroaching debris along paved trail/ sidewalk edges
- Regrade to prevent or eliminate low spots and drainage issues
- Add culverts, bridges, boardwalks, retaining walls, etc. to prevent or eliminate drainage/ erosion issues
- Reroute trail, if necessary, to avoid environmentally sensitive or overused areas and any safety issues

Task: Seasonal Maintenance

Seasonal tasks should be performed as needed. When conditions cannot be improved to provide for safe use, the facility should be closed to prevent the risk of injury to facility users. Designated maintenance crews will remove leaf debris, snow, and ice, etc. from all network facilities as soon as possible. Leaf debris is potentially hazardous when wet and special attention should be given to facilities with heavier usage. Ice control and removal of ice build-up is a continual factor because of the freeze-thaw cycle. Ice control is most important on grade changes and curves. Ice can be removed or gravel/ice melt applied. After the ice is gone, leftover gravel should be swept as soon as possible.

- Remove leaf litter from network facilities, via raking, blowing, mulching, etc. as needed to sustain the safe usability of all network facilities and prevent any storm water drainage and/or erosion issues
- Remove snow and ice from network facilities, via shoveling, picking, salt, sand, etc. as soon as possible after storm

Task: Habitat Enhancement and Control

Habitat enhancement and control can improve aesthetics, help prevent erosion, and provide for wildlife habitat. Habitat control involves mitigation of damage caused by wildlife.

- Plant vegetation, such as trees and shrubs
- Take preventative measures to protect

landscape features from wildlife, such as installing fencing around sensitive or newly planted plant materials
- Apply herbicide to eliminate any problem plant species, such as poison ivy or kudzu, etc.
- Apply herbicide to maintain facility edges and prevent encroaching vegetation, such as along trails and sidewalks
- Deter interaction between facility users and facility inhabitants, such as feeding the wildlife, etc.

6.4 Administration and Jurisdictional Responsibilities

6.4.1 Operation Responsibilities by Department

City of Greensboro Parks and Recreation Department

Duties for the Park and Recreation Department and Trail Division within the Department would include carrying out the recommendations from this Plan, applying for funding, and overseeing all greenway facilities. Staff should also conduct tasks such as updating and publishing new maps, creating and updating GIS layers of all greenway facilities, proposing future alternative routes, and working with adjacent communities/counties to coordinate linkages. The Parks and Recreation Trails and Greenway Director and/or staff should also play a role in education and encouragement programs.

Greensboro MPO (Greensboro Department of Transportation (GDOT) Planning Division)

Representatives from the Greensboro MPO should take on the responsibilities of "Pedestrian Coordinator" and "Bicycle Coordinator." These duties would include carrying out recommendations from this Plan, applying for funding, overseeing planning, design, and construction of the pedestrian and bicycle systems, and coordinating with local and regional jurisdictions and NCDOT. These coordinators should work with other MPO staff to conduct tasks such as updating and publishing new local bicycle maps, creating and updating GIS layers of all bicycle facilities, coordinating education, enforcement, and encouragement programs, monitoring the use and safety of pedestrian and bicycle facilities, proposing future alternative routes, and working with adjacent communities and regional organizations to coordinate pedestrian and bikeway linkages.

Field Operations Department / City Engineering and Inspections/GDOT

The Field Operations Director should oversee the construction and maintenance of all trail, bicycle, and pedestrian facilities. The Field Operations section devoted to Streets should also be devoted to future recommendations for the bicycle and pedestrian networks, discussed earlier in this plan. One member of the Field Operations Department should handle facility development and construction (including posting bicycle route signs) among his/her other responsibilities.

North Carolina Department of Transportation (NCDOT)

NCDOT Division Seven should maintain all pedestrian and bicycle facilities within the roadway rights-of-way that are owned by the state (with the exception of sidewalks on local streets). This includes paved shoulders, bicycle lanes, crosswalks, pedestrian signals, and sidewalks on main roadways. The Greensboro MPO should work with NCDOT to develop a schedule for routine maintenance and a means of identifying locations for spot maintenance improvements.

Police Department

All local police officers should be educated about North Carolina's bicycle and pedestrian laws to promote positive interactions between bicyclists, pedestrians,

and motorists. The Guide to North Carolina Bicycle and Pedestrian Laws, written by the NCDOT Division of Bicycle and Pedestrian Transportation, should be distributed to local law enforcement. Specific laws in the State of North Carolina include wearing a helmet under the age of 16, having an adequate light if riding after dark, riding on the right side of the road, and proper signaling when turning. Police officers should become more proactive in educating the public and enforcing laws when they are broken.



Figure 6(b). Local citizens cleaning along roadway at Barber Park. Volunteers can contribute in numerous ways, relieving the burden on City agencies.

Volunteers

Services from volunteers, student labor, and seniors, or donations of material and equipment may be provided in-kind, to offset construction and maintenance costs. Formalized maintenance agreements, such as adopt-a-trail/greenway or adopt-a-highway can be used to provide a regulated service agreement with volunteers. Other efforts and projects can be coordinated as needed with senior class projects, scout projects, interested organizations, clubs or a neighborhood's community service to provide for the basic needs of the proposed networks. Advantages of utilizing volunteers include reduced or donated planning and construction costs, community pride and personal connections to the City's greenway, bicycle, and pedestrian networks. Greensboro has been utilizing volunteer efforts to assist in the maintenance of greenway facilities. However, because annual obligations are not enforced, volunteer services are not being used to their greatest advantage. Specific tasks should be outlined in an agreement between the Trails Division and the volunteer party. A review of this agreement should be done as needed to maximize this important resource.

6.4.2 Maintenance Responsibilities by Facility Type

Maintenance responsibility will be with the Parks and Recreation and Field Operations departments depending on the type of facility to be maintained. A number of other jurisdictions and entities, homeowner associations, and business groups will also have roles in maintaining specific facilities in the pedestrian, bicycle, and greenway networks. It will be helpful to create a citizen's group that could ultimately play an important role in coordinating and advocacy (See stewardship discussion, Section 6.1.2). A recommended maintenance schedule is included in Tables 6(b) and 6(c) for each system.

Type I Greenway Facilities and other Resource Conservation Areas

These spaces would be maintained by Field Operations or Leisure Services crews or by homeowner associations where appropriate, for dedicated areas added into the system by new development.

Type II, III, and IV Greenway Facilities

The City Parks and Recreation and Field Operations Departments will be key agencies in the maintenance of facilities along roads, utility corridors, and stream





corridors. The Parks and Recreation Department, or where appropriate, homeowners associations, should maintain the off-street trail and greenway system.

Bicycle Facilities (Type V Greenway Facilities)
This system should be maintained by GDOT and the Field Operations Departments, NCDOT, and patrolled by the City Police Department and Guilford County Sheriff's Office. A key to continued success will be the establishment and acceptance of bicycle facility operations and maintenance guidelines and proper training of both supervisory and field personnel regarding on-road bicycle facility upkeep. There should also be interagency coordination and user feedback protocols that assure timely response to citizen complaints and suggestions, including a website and toll-free hotline for pedestrian and bicycle maintenance requests. Bicycle route signs and bicycle racks should also be maintained by GDOT and NCDOT, depending on the types and locations of facilities.

Pedestrian Facilities (Type V Greenway Facilities)
Within the City of Greensboro, major sidewalk repairs are made by the City. Yet, there is a significant backlog of sidewalk maintenance needs. Routine sidewalk maintenance is to be performed by the adjacent property owners and tenants, as prescribed by city ordinances. This may include individual owners, business and resident associations and special districts, as applicable. In suburban and rural areas outside the City, sidewalks on main roadways should be maintained by NCDOT and sidewalks on residential streets should be maintained by property owners.

Trailheads and Feature Areas
These areas are to be maintained by the Field Operations and Parks and Recreation Department or the respective homeowners associations if appropriate.

Other Ancillary Facilities
Special furnishings and amenities such as benches and signage will be the responsibility of the appropriate jurisdictional entity such as the Field Operations and Parks and Recreation Departments.

6.4.3 Administrative and Jurisdictional Recommendations

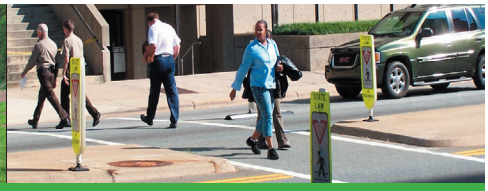
Actions to implement the following administrative and jurisdictional recommendations are described for each system below.

Overall Network
To sustain the relationship between the Parks and Recreation and GDOT/MPO, a committee should be formed to integrate facilities, provide programs and distribute information, investigate alternative funding options, develop performance measures, and share information, such as GIS data. Communications with and involvement from stakeholders and citizens should be continued throughout the implementation of this Plan.

Action: Create an interdepartmental committee
- To oversee the implementation of this plan
- Provide oversight, coordination, and leadership for the overall network
- Sustain communication between departments/agencies to avoid overlap or gaps in the operation, maintenance tasks, or implementation of the network

Greenway
Currently, the Park and Recreation Department's Trails Division is responsible for the majority of greenway operations and maintenance. However, funding is extremely limited. Only 35% of the already limited operations and maintenance budget goes directly to routine and remedial maintenance costs. In order to increase the revenue generated for operations and





maintenance of greenway facilities, the following actions are recommended.

Action: Develop a non-profit group or coalition for greenways.

The following is a list of the duties associated with the Friends of the Little Tennessee River Greenway in Macon County, NC. *Friends of the Greenway (FROGs) assist Macon County in the management and development of the Little Tennessee River Greenway in a number of ways:*

- *Serve the public through the acquisition, restoration, protection, and enhancement of the natural resources.*
- *Integrate public recreational, historical, and cultural facilities with compatible commercial interest adjoining the Greenway.*
- *Develop an informational center and educational materials to enhance awareness of environmental and historical value of the Greenway.*
- *Assist local government in funding through grants, donations, leasing of concessions, and special events.*
- *Maintain a board and committees that fairly represent a diversity of interests in the community*

The City of Greensboro should work to establish a "Friends of the Greenways" organization that can help to advocate for and promote the full development of the community-wide greenway system. Friends groups can help to raise awareness and funds for greenway facility development and operation. The mission of these groups can be very simple, for example, the Friends of the Grand Forks Greenway has the following mission:

"The Friends of the Greenway is a volunteer community grass-roots effort to support the development of the Red River and Red Lake River corridors that exist between the Army Corps of Engineers Flood Protection Project within the cities of Grand Forks, ND and East Grand Forks, MN."

The Greensboro Friends of the Greenways could be a subset of the Friends of the Parks organization. In this manner, the two Friends organizations would coordinate activities and mutually support each other's mission. It must, however, be clearly understood that both Friends organizations should operate on equal footing. In other words, the Friends of the Greenways would not be subservient to Friends of the Parks. Support and backing for Parks is not more important than support and backing for Greenways. So it will be up to the City and the Friends organization to work out the logistics so that equal opportunity is afforded both groups.

Typically, Friends of the Greenway will assist the City with promoting and advocating for the Greenway System. They can sponsor events that raise funds for the system. They can host community forums and meetings that increase awareness. They can sponsor events, such as hikes and races, which encourage residents of the community to use the greenways more often. Many Friends organizations operate under a non-profit, 501c3 status so that they can receive contributions from individuals and private sector groups.

Action: Organization of Greenway O&M

This organizational structure is currently under review at the City of Greensboro Parks and Recreation.

Action: Hire and train new greenway maintenance crew personnel

- To maintain greenway facilities as described





in Table 6(b), Greenway Routine and Remedial Maintenance Tasks

The Trails Division currently has two full-time employees and one part-time employee to maintain 47.2 miles of trail. Maintenance responsibilities include mowing, weed eating, repair of storm damage, blowing trails, removing leaves, installing drainage, pesticide application (with license), etc. The only task not handled by the maintenance crew personnel is paving or repaving trail surfaces. Mowing and any other required maintenance is provided to each existing trail every 2-3 weeks. To improve maintenance standards for greenway facilities and predict future maintenance needs, the consultant recommends a maintenance crew person for every 16 miles of trail in need of maintenance. Currently, another full time maintenance crew person should be hired for the existing trail system. As additional mileage is added to the system, staff should be added in part time or full time positions to accommodate greater maintenance needs.



Figure 6(c). Signage is an ancillary facility that requires maintenance.

Bicycle

Action: Continue to work with other local and regional jurisdictions and NCDOT to develop and maintain bikeways.

The Greensboro MPO should designate a full-time Bicycle Coordinator, as mentioned below. This coordinator would be responsible for the development of the bicycle system, which will require coordination with many other agencies and jurisdictions.

Action: Create an Assistant Bicycle Coordinator Position.

Because of the growing need to develop the on-road bicycle system and supporting education, enforcement, and encouragement programs, the Bicycle Coordinator should also have an assistant. The general responsibilities of the Bicycle Coordinator and Assistant Bicycle Coordinator are listed below.

Bicycle Coordinator

- Overall implementation of on-road bicycle recommendations in this Plan
- Future on-road bikeway planning
- Roadway design and construction project review
- Interagency and jurisdiction coordination
- Grant applications
- Public outreach
- Staff training on bicycle issues
- Reporting to the transportation director

Assistant Bicycle Coordinator

- Reviewing and addressing public feedback
- Monitoring on-road bicycle system

performance (safety, usage, amount of facilities provided)
- Coordinating education, enforcement, and encouragement programs
- Monitoring the demand for and installing new bicycle racks
- Replacing bicycle route signs and continually evaluating bicycle routes
- Oversight of on-road bicycle facility maintenance

Pedestrian

Action: Continue to work with other local and regional jurisdictions and NCDOT to develop and maintain pedestrian facilities.

The Greensboro MPO should designate a full-time Pedestrian Coordinator, as mentioned below. This coordinator would be responsible for the development of the sidewalks and pedestrian crossing facilities, which will require coordination with many other agencies and jurisdictions.

Action: Create an Assistant Pedestrian Coordinator Position.

The significant amount of pedestrian facility and program needs will require additional staff to address adequately. Therefore, the Pedestrian Coordinator should also have an assistant. The general responsibilities of the Pedestrian Coordinator and Assistant Pedestrian Coordinator are listed below.

Pedestrian Coordinator
- Overall implementation of pedestrian recommendations in this Plan
- Future pedestrian facility planning
- Roadway design and construction project review
- Interagency and jurisdiction coordination
- Grant applications
- Public outreach
- Staff training on pedestrian issues
- Reporting to the transportation director

Assistant Pedestrian Coordinator
- Reviewing and addressing public feedback
- Monitoring the performance of sidewalk and pedestrian crossing facilities (safety, usage, amount of facilities provided)
- Coordinating education, enforcement, and encouragement programs
- Oversight of pedestrian facility maintenance

6.5 Cost of the Operations and Maintenance Program

Annual operations and maintenance costs vary, depending upon the facility to be maintained, level of use, location, and standard of maintenance. Operations and maintenance budgets should take into account routine and remedial maintenance over the life cycle of the improvements and on-going administrative costs for the operations and maintenance program. Table 6(e) provides an overview of approximate costs for basic bicycle, pedestrian and greenway trail operations and maintenance services. The estimates include field labor, materials, equipment and administrative costs. Table 6(f) provides a sample of comparable programs in other metropolitan areas that may be helpful in gauging the costs associated with a large-scale greenway, bicycle, and pedestrian system.





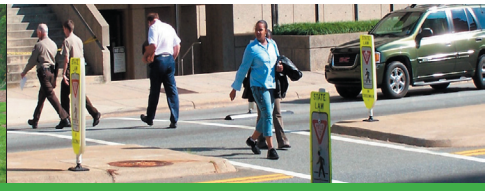
Annual Maintenance Costs		
Description/Activity	Frequency	Costs
Drainage Maintenance	4x/year	$750
Sweeping/Blowing Trails	20x/year	$1500
Pick Up & Trash Removal	20x/year	$1500
Weed Control	10x/year	$1250
Mowing - 3 foot safe zone	20x/year	$1800
Minor Repairs	Annual	$750
Maintenance and Supplies	Annual	$500
Equipment fuel and repairs	Annual	$1000
Total Maintenance - One Mile		$9050

Table 6(e). Approximate annual costs per mile of facility.

Comparable Programs			
Entity	Facilities Mix	Acreage	Annual Budget
Jefferson County Open Space Program, Golden, Colorado	Mostly natural open space with all-terrain trails, trailheads and minimal amenities. (450,000 residents in jurisdiction with 2 million visitors to open space.)	51,000	$6 million (from 1/2 cent sales tax)
South Suburban Parks and Recreation District, Littleton, Colorado	Mix of parks, paved and non-paved trails (111 miles), open space. Metro Denver (160,000 residents in District)	3,200	$5 million (property tax)
City of Albuquerque Open Space Program	Mostly natural open space (mountains, arroyos and river bottomlands with all-terrain trails, trailheads and minimal amenities (450,000 residents in city). Includes administration, resource management, law enforcement and visitor services.	28,000	$3.5 million (1/4 cent gross receipts tax)

Table 6(f). Comparable programs and associated budgets.





6.5.1 Routine Operations and Maintenance Costs

While actual costs will vary depending upon a number of factors, such as future availability of water and labor rates, the estimates can provide a general idea of potential operations and maintenance obligations. Following are typical annual costs for key components:

Natural and Buffer Areas

Maintenance of greenway corridors costs between $75 and $200 per acre, per year, depending on the level of use and disturbance. The Jefferson County Open Space Program offers a comparable situation, managing 51,000 acres of passive facilities at a cost of $118 per acre annually. Two million visitors use the facilities in the Metro Denver area each year.

Drainage channels

With minimal landscaping and including debris pick up, weed control, and minor repairs, a drainage channel may cost about $2,500 per mile, annually. It is assumed that the City Field Operations Department and homeowner associations would participate in this effort.

Landscaped greenspace (Approximately 100 foot wide corridor)

Landscaped greenspaces are assumed to be semi-developed park spaces and cost $37,000 per mile, per year to maintain. Maintenance includes addressing items such as: weed control; litter and graffiti management, erosion control, irrigation, plant grooming, and law enforcement.

Type II and III Greenway Facilities (All-Terrain Trails)

Annual maintenance costs range from nominal to $2,000 per mile/year depending on usage and level of development. East Bay Regional Park District has estimated $1,000 per mile/year. Volunteers may absorb all or part of this function.

Type IV Greenway Facilities (Multi-Use Off-road Trails)

Crew sizes tend to range from 0.5 to 5 full time employees (FTE's) per 10 miles of off-street trail. Annual routine maintenance costs may range from less than $3,000 to over $7,000 per mile. Routine cleanup and monitoring of facility conditions should be handled by volunteers and maintenance crews.

Bicycle Facilities

It is assumed that the current City of Greensboro street maintenance crew and NCDOT Maintenance Division will be able to maintain the on-roadway bicycle facility system. Some provision should be made however for fifteen regular inspections per year, to include minor repair or replacement of signs, vegetation grooming and other items that an inspector could remedy in the field. Additional attention should be paid to any potholes or other pavement damage. Some additional sweeping will be required where bicycle lanes and wider shoulders are provided along roads.

Pedestrian Facilities

In the City of Greensboro, NCDOT requires property owners or Homeowner Associations (HOAs) to maintain sidewalks. Sidewalks on local and collector streets are assumed to be maintained by property owners and homeowner associations, while sidewalks on arterial streets should be maintained by the Department of Field Operations. Crosswalks, pedestrian signals, curb ramps, median crossing islands, and other pedestrian facilities should be maintained by GDOT or NCDOT, depending on right-of-way ownership. The City of Greensboro has agreed to maintain sidewalks in some places where they have been required by development regulations. It is recommended that NCDOT maintain all sidewalks on NCDOT rights of way. Maintaining





these pedestrian facilities is an important part of maintaining the complete right of way for all users. NCDOT should maintain sidewalks and pedestrian crossing facilities on major roadways in areas outside of the City of Greensboro. Cracks, surface defects, tree root damage, and other problems should be identified on a regular basis and fixed to ensure that sidewalks remain accessible to all types of pedestrians.

6.5.2 Remedial Operations and Maintenance Costs

(These tables are included in the annual routine maintenance costs.)

Type II and III Greenway Facilities
(Off-road non-paved-all-terrain trails)

For purposes of this study, remedial work on non-paved trails will be assumed to be negligible, since volunteers may accomplish much of this work. There may be some administrative costs associated with this.

Type IV Greenway Facilities
(Off-road paved trails)

A 10-to-12-year life is assumed for asphalt and crushed fine trails after which an overlay may be required. A complete resurfacing after 20-25 years is anticipated. Concrete is assumed to last twice as long. Bridges, tunnels, retaining walls and other heavy infrastructure are assumed to have a 100-year life or longer.

On-road Bicycle Facilities

Remedial work for on-road bicycle facilities includes asphalt repaving (5' on either side of the street for a two-way bike route, total 10' width) along with curb and gutter, sewer-grate and manhole repair. Pothole and crack repair are considered routine. Pavement markings, such as bicycle lane lines, bicycle stencil markings, and edgelines should be re-installed when other roadway pavement markings are improved. Since this work is done as part of the current street maintenance regime the cost is assumed to be covered.

Pedestrian Facilities

Sidewalks should be constructed with concrete, which requires replacement in 50 to 75 years. A rough cost estimate for a linear mile of concrete sidewalk is $400,000, including the base material, concrete, and construction work. This does not include the design and Right-of-Way (ROW)/easement purchases.

6.6 Funding the Operations and Maintenance Program

Identifying funding sources, creating funding sources and sustaining reliable funding over the long term is critical to the overall success of operations and maintenance and, ultimately, the success and growth of the Greensboro Bicycle, Pedestrian and Greenway Network. Several types of funding sources can be identified and a combination of these might offer the best solutions. The following are potential sources for operations and maintenance. Appendix D identifies funding sources for project design and implementation.

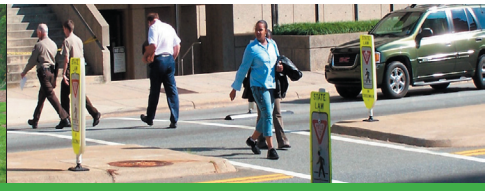
Budget Allocations to Current Agency Programs

These are funds coming directly from existing agency and department programs as part of annual budget contributions. Typically this is the base revenue source for operations and management.

Multi-Objective Partnerships

Most trails serve multiple public and private benefits including access for floodway and ditch upkeep, utility access, street maintenance, and enhancement of adjacent private properties. This may pose a number of opportunities for task sharing and cost sharing among the various beneficiaries, particularly with respect to storm drainage management along river, creek, and wetland corridors.





In-Kind Services

In-kind services involve people, such as volunteers, youth and student labor, and seniors to provide routine maintenance practices to network facilities. In-kind services may also include donations of material and equipment. Another consideration is the adopt-a-trail program, which works with service clubs, scouts, school groups, businesses and others. Adopt-a-trail programs should include credit signage and written agreements with the adopting group.

Trust Fund

Working in partnership with the Friends of the Greenway, the City of Greensboro may be able to establish a Greenway Trust Fund. This Trust Fund would be a dedicated source of funding that supports the operation and management of portions of the greenway system. The Friends of the Greenways would work with a private financial institution to set up an investment account or work with a local foundation to establish an endowment. Contributions to the fund would be solicited from greenway advocates, businesses, civic groups, and other foundations. The goal would be to establish a capital account that would earn interest and use the interest monies to support greenway maintenance and operations. Special events could be held whose sole purpose is to raise capital money for the Trust Fund. A trust fund can also be used in the acquisition of high-priority properties that may be lost if not acquired by private sector initiative.

The following is an example of the Mountains-to-Sound Greenway Legacy Fund in Washington.

The Mountains to Sound Greenway Legacy Fund is an endowment fund managed by The Seattle Foundation. Its purpose is the protection of the Mountains to Sound Greenway, for the public good, in perpetuity. It will be used to support restoration, enhancement, education and advocacy programs of the Mountains to Sound Greenway Trust. Currently we have a goal of raising $1 million for the Greenway Legacy Fund by July 2006. This will kick off a multi-year endowment fund campaign with a goal to raise $5 million.

Revenue from Programming

The City of Greensboro should also work with the Friends of the Greenway to capture and direct fees and revenues that are derived from greenway events and activities into an account that can be dedicated to operating and managing the greenway system. Revenues could be used to support the Greenway Trust Fund. As defined in Chapter 5, there are numerous opportunities to program greenway lands and facilities for activities that can generate revenues. The City of Greensboro should work actively, and in partnership with a Friends of the Greenway organization, to define events that can occur throughout the calendar year, and determine which of these events has the capability of generating revenues that support operations and management of the greenway. Grand Forks, North Dakota has demonstrated that a properly operated greenway can generate upwards of $250,000 in direct revenues annually for use in off setting the cost of operations and maintenance costs.

Working with the Community Foundation of Greater Greensboro

Throughout the United States, more and more community foundations are becoming interested and involved with the development of greenway systems. Greenways are excellent community-based pursuits and normally match up well with the mission of community foundations. Action Greensboro, Inc. is a partner in The Community Foundation of Greater Greensboro, and has been one of the principal partners in the preparation of this Plan. So the link between greenways and the local community foundation has already been established.





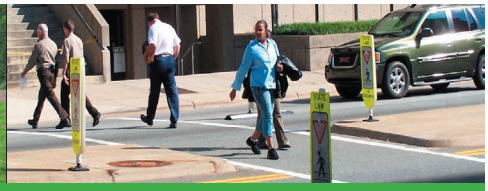
Other community foundations throughout the nation have taken on the task of greenway development as a major initiative. For example, the Community Foundation for Southeastern Michigan took a lead role in developing the Southeast Michigan Regional Greenway Plan. The foundation raised more than $25 million for the greenway system, provided technical assistance to partners, awarded financial grants to build projects and established an endowment for maintenance and operation.

6.7 Other Operations and Maintenance Resources

6.7.1 Conflict Reduction

- Plan, design, and manage to reduce conflicts among users, with adjacent properties including: reckless and unsafe behavior; incompatible uses; trespassing; disturbances and adverse environmental impacts
- Recognize the different goals of different users, such as equestrians and bicyclists, and separate where feasible
- Provide user education through signage, patrol, volunteers, brochures, and media
- Provide adequate trail mileage and bicycle, pedestrian, and greenway acreage to accommodate user populations
- Solicit input from user groups by providing contact information to report problems and responding promptly and effectively to complaints, concerns, or suggestions
- Monitor, document, and log problem areas and address problems through design and management
- Promote trail etiquette
- Educate bicyclists and hikers on how to pass horses using subdued voice cues rather than bells, horns, or sudden loud noise that might startle a horse
- Avoid excessive regulatory signage
- Employ temporary closure of facilities when conditions dictate or for resource recovery
- Maintain facilities as specified in this chapter
- Distribute or publish a maintenance schedule
- Respond to illegal or disturbing activity quickly





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Best Practices in Trail Maintenance

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LTAP
LOCAL TECHNICAL ASSISTANCE PROGRAM

Indiana LTAP







Best Practices in Trail Maintenance

A Manual by the Ohio River Greenway

PURDUE
ENGINEERING

Best Practices in Trail Maintenance

A Manual by the Ohio River Greenway

November 2014

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This manual is intended for practical use by trail maintenance managers, and particularly those working along the Ohio River Greenway and in similar environs. It will also be useful for policy makers who are tasked with anticipating and planning for maintenance budget and personnel needs.

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Abstract

This manual is intended for practical use by trail maintenance managers. It will also be useful for policy makers who are tasked with anticipating and planning for maintenance budget and personnel needs. The recommendations included in this manual were chosen, in part, to facilitate widespread adoption by other trail operators. They are cost-effective solutions that require minimal technological or financial commitments.

This manual does not provide guidance for trail construction and design, except where a maintenance issue can best be resolved by constructing new trail segments. For best practices in design and construction, consult the thorough list of resources provided on the Recreational Trails Program page of the Federal Highway Administration website.[1]

The contents of this manual reflect the views of the author, who is solely responsible for the accuracy of the data presented. This manual does not constitute or supersede standards, specifications, or regulations, and does not establish a legal standard of care for users.

Keywords: best practices, maintenance, trail, greenway, Indiana, assets

[1] Federal Highway Administration. (2014). Recreational Trails Program. *http://www.fhwa.dot.gov/environment/recreational_trails/guidance/manuals.cfm*

Section 1: Overview/Background

1.1 Trail Maintenance: Trends, Standards, and Practices

A national push for the construction of new bicycle and pedestrian facilities began in the early 1990s. The results were notable: an 80-fold increase in new construction spending (between 1988 and 2002), the designation through the White House Millennium Initiative of more than 2,000 local, shared-use Millennium Trails, and close to 5,000 state-driven trails projects in progress in 2002.[2] In Indiana, this movement has created "more than 3,268 miles of trails and bikeways open for public use across the state," nearly meeting the goal set by the Indiana Department of Natural Resources of "having a trail within 7.5 miles (or 15 minutes) of all Indiana residents by 2016" in July, 2013.[3]

The explosion of multi-use paths brings increased health and recreational opportunities for users, and new planning challenges for trail managers. While the majority of Indiana's trails have been built with a mix of state and federal funding, the funding options for non-construction activities are comparatively few: in addition to the RTP (Recreational Trails Program), the FHWA lists only the "STP (including the enhancement set-aside), the Highway Safety Improvement Program, and the CMAQ Program (23 U.S.C. 217(a)). State and Community Highway Safety Grant Program funds (Section 402) are to be used exclusively for nonconstruction activities."[4] Additionally, it is far easier to find technical support for design and construction matters than for maintenance concerns. This manual, sponsored by the Indiana Local Technical Assistance Program, is a first response to this deficit of information.

Deferred trail maintenance is a nationwide issue. As our leading expert in parks and preservation services, the National Park Service, approaches its 100-year anniversary in 2016, it faces a multi-billion dollar backlog of deferred maintenance.[5] The problem of securing funding for maintenance is not unique to trails: Smart Growth America states that, between 2009 and 2011, annual state spending on expanding and constructing roadways (accounting for 1% of the total state-owned road network) was at $20.4 billion, while annual state spending on maintenance and preservation (caring for the other 99% of the network) stood at only $16.5 billion.[6] Such spending priorities do not reflect that nearly a quarter (21%) of the national road network was rated in poor condition in 2011.

In 2011, INDOT estimated the cost-per-mile of constructing new separate-alignment, shared-use paths at $775,000, and the cost-per-mile of building out and maintaining an existing separate-alignment, shared-use path at $115,000. [7]

[2] Center for Environmental Excellence, p. 48

[3] INDOT, Bicycle and Pedestrian Program

[4] INDOT, Bicycle and Pedestrian Program; FHWA, Bicycle & Pedestrian Program

[5] Clementino, *Deferred Maintenance*

[6] Smart Growth America, *Repair Priorities 2014*

[7] INDOT, Indiana Safe Routes to School Program. This is no longer a standalone program, so these figures could not be investigated; however, these are the most recently available figures available from the state, and are thus included herein.

Table 1. Milwaukee Construction Cost-Per-Mile Estimates

Segment/Trail	Description	Cost-per-mile
Honey Creek Parkway	bike trail from Portland Ave to 70th St, not including bridge construction	$149,206 per mile for 10 foot wide asphalt trail
Root River	from 60th St. under Hwy 100 to Rainbow Airport, not including boardwalk	$301,014 per mile for 10 foot wide asphalt trail
South Side Trail (a.k.a. Kinnickinnic River Bicycle Trail)	base construction including trail amenities, signage, and drainage issues	$176,470 per mile for a 10 foot wide asphalt trail
Hank Aaron State Trail (West Allis Line)	6.5 miles, including retrofit of bridges	$224,307 per mile for a 10 foot wide asphalt trail

Source: Milwaukee County Dept. of Parks, Recreation, and Culture
http://www.americantrails.org/resources/ManageMaintain/MilwMaintcost.html

A comparison of the cost estimates for construction in Milwaukee (Table 1, above) and an assortment of cost estimates for maintenance services (Table 2, below) likewise demonstrate that construction is much more costly than routine maintenance.

Table 2. Assorted Maintenance Cost Estimates

Source	Trail	Cost-per-mile
provided in the Iowa Trails 2000 plan by the Iowa Department of Transportation	a mixture of different surfaces	$1,500 per mile
Milwaukee County Park System	all asphalt paths	$2,525 per mile
Rail Trail Maintenance & Operation Manual provided by the Rails-to-Trails Conservancy		$1,200 per mile (absolute minimum)
for government run trails in the Rail Trail Maintenance & Operation Manual provided by the Rails-to-Trails Conservancy		$2,077 per mile
in the Trail Cost Model - Draft by the Wisconsin Department of Natural Resources	unpaved trail	$2,042.06 per mile

Source: Milwaukee County Dept. of Parks, Recreation, and Culture
http://www.americantrails.org/resources/ManageMaintain/MilwMaintcost.html

Despite the difficulties with comparing collected cost data, which is compiled by different agencies on varying criteria, it is clear that initial construction costs dwarf the costs of routine maintenance and enhancement of existing facilities; however, as this manual will stress, deferring maintenance can dramatically increase maintenance costs and invert that cost balance. Unfortunately, deferment is common since funding for routine maintenance has been comparatively difficult to secure. As trails age without appropriate maintenance, opportunities for substantial cost-savings through early intervention shrink. Despite a present lack of funding and technical support, local trail managers are obligated to maintain federally-funded trailways in accordance with standards for public safety and access rights (see Table 1). In addition to compiling a menu of best practices for managers' reference, this document highlights the important role of maintenance to the longevity of trail systems.

Table 3. National, State, and Industry Standards

Indiana Department of Transportation – 2013 Design Manual. Chapter 51 – Special Design Elements.	http://www.in.gov/indot/design_manual/files/Ch51_2013.pdf
ADA.gov. Information and Technical Assistance on the Americans with Disabilities Act	http://www.ada.gov/ada_req_ta.htm
The American Association of State Highway and Transportation Officials. Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2010 (AASHTO Pedestrian Guide)	http://www.railstotrails.org/resources/documents/ourWork/trailBuilding/DraftBikeGuideFeb2010.pdf
The American Association of State Highway and Transportation Officials. Guide for the Development of Bicycle Facilities, 1999 (AASHTO Bike Guide)	http://www.fhwa.dot.gov/environment/recreational_trails/guidance/manuals.cfm#aashto
Federal Highway Administration. Program Guidance.	http://www.fhwa.dot.gov/environment/recreational_trails/guidance/manuals.cfm#links
Federal Highway Administration. A Guide for Maintaining Pedestrian Facilities for Enhanced Safety.	http://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa13037/

1.2 The Ohio River Greenway: History

The Ohio River Greenway is a paved, multi-use, urban, linear recreational trail in Southern Indiana that roughly follows the course of the Ohio River. When it is completed in 2015, the 7-mile trail will pass through the Southern Indiana cities of Jeffersonville and New Albany and the town of Clarksville, and, with the 2014 opening of the Big4 Pedestrian Bridge, spans the Ohio River to link Jeffersonville to Louisville, KY.

The purpose of the Greenway is to increase connectivity between the three riparian localities, between their residents and the natural resources and services provided by the Ohio River, and between the cities on either side of the Ohio River. The design of the Ohio River Greenway provides recreational opportunities, a contiguous alternative transportation option between municipalities, natural resource protection, opportunities for cultural and educational learning, a local economy stimulus, and health and wellness activities.

Governance of the Greenway is complicated, as the trail falls within three local governmental jurisdictions – the cities of New Albany and Jeffersonville, and the town of Clarksville – which, in turn, are within the boundaries of Floyd and Clark counties. Additionally, the Greenway intersects with lands that belongs to a state (Falls of the Ohio State Park), and lands that are managed by the U.S. Army Corps of Engineers, a federal agency. Each of these entities observes a distinct set of rules related to funding sources and management procedures, which were partially spelled out in the June 2003 Project Cooperation Agreement between the Department of the Army (Corps of Engineers) and the non-Federal sponsors (Ohio River Greenway Development Commission, City of New Albany, Town of Clarksville, and the City of Jeffersonville).

The Ohio River Greenway Commission was created in 1993 to facilitate the collaborative governance of the Greenway, and to serve as a non-profit, quasi-governmental channel for funding and other resources. The genesis of the Ohio River Greenway Commission was a charter by the Indiana Legislature in April 1993, which created the Ohio River Greenway Development Commission and granted it the power to coordinate, recommend, and implement Ohio River Greenway activities.

The Commission is comprised of three persons from each of the three local governments – the Chief Executive (Mayor or Town Council President) of each locality and that Chief Executive's two citizen appointees – as well as representatives from Clark and Floyd Counties who are appointed by the Governor for four year terms. Non-voting members that lend support to the Commission include the Director of the Office of Tourism, the Director of the Indiana Department of Natural Resources, the Commissioner of the Indiana Department of Transportation, and the President of the Indiana Economic Development Corporation. Appointed and non-voting members of the Commission are volunteers (Ohio River Greenway Commission, 2014). The present organization and membership of the ORGC, including its standing committees, are shown in Appendix A.

In 2007, the Commission added an employee, a project manager, and in 2013, it hired a part-time administrative assistant. Also in 2013, realizing the pressing need for a maintenance policy and manual to coordinate maintenance of the completed portions of the greenway, the Commission applied for and was awarded a grant through the Indiana Local Technical Assistance Program (LTAP) to research and develop a trailway maintenance manual.

Figure 1. Map of the Ohio River Greenway



Source: Ohio River Greenway, http://www.ohiorivergreenway.org

1.3 Ohio River Greenway: Current Maintenance Practices & Anticipated Needs

The first step to creating a maintenance program is to understand current and anticipated needs and assess the local capacity to meet them. Currently, maintenance of the Ohio River Greenway is handled by various departments within each of the three communities. The table below summarizes the current approach to maintenance. This information was gathered through interviews with officials from the three Ohio River Greenway communities.

Table 4. Current Practices

	Clarksville Parks & Recreation	New Albany Flood Control District	Jeffersonville Parks and Recreation	Jeffersonville Redevelopment
Mowing	Y	Y	Y (Contract Out)	
Edging	Y	Y	Y (Contract Out)	
Landscaping	Y	Y	Y (Contract Out)	
Trash/Debris Removal	Y	Y	Y	
Graffiti Removal	Y	Y	Y	
Signage	N	Y		Y
Gate & Fencing	–	Y		Y
Lighting	Y (Contract Out)	Y		Y
Drainage & Riprap Areas	Not Yet	Y	N	N
Benches	Y	Y		Y
Picnic Tables	Y	Y		Y
Garbage Cans	Y	Y	Y	Y
Play Structures	–	Y	–	–
Flagpoles	Y	Y		Y
Docks	–	Y		Y
Seasonal Care (i.e. snow removal, flooding, etc.)	N	Y	N	N
Other				

The interviews revealed common concerns. For example, none of the communities currently uses a mobile application to capture trail user concerns, although there is expressed interest in doing so in the future. Many robust models exist currently: one well-designed example is the Louisville Mobile "suite" of apps, created by Ohio River neighbor Louisville, KY, which includes user feedback options for the 100-mile Louisville Loop multi-use path.[8] Additionally, all three communities anticipate a range of repairs to the asphalt and concrete trailways and bridge decks in the near future, and are concerned with associated costs.

[8] Net Tango, Louisville Mobile

Taking or updating an inventory of fixed assets is another important step in managing maintenance planning. The Ohio River Greenway inventory was created using GISCloud, a mapping software, to list and map its fixed assets. The major challenge in creating an inventory is to define its scope: determining the relevant distance from the trailway edge, whether to count trees and other natural features, whether and how to note the presence of above or below ground fiber optic and power lines, what trail uses are allowed, and so on. If the trail is in an urban setting, it might be useful to inventory trail crossings, noting elements such as crossing width and type, signage and pedestrian signals, and ADA accessibility for the ramp and grade.[9] There are numerous, customizable inventory templates available online, and the Ohio River Greenway inventory template is included in Appendix C.

Section 2: Tools for Creating and Implementing a Maintenance Plan

2.1 Anticipating Maintenance Costs

Maintenance costs are highly variable. Geography, regional economy, exposure, allowed uses, frequency of vandalism, labor costs, and requirements of needed maintenance all play a role in determining the financial burden of trail maintenance.

Labor: Many trails owners reduce labor costs by partnering with local nonprofit or volunteer advocacy groups, while others enjoy a dedicated budget or an active collaboration with an existing agency, such as a local parks and recreation department. In recent years, contracting out for major work has become increasingly common, as governmental hiring has slowed and budgets have contracted in recent years. Thus, in-house skills and resources of a trail management crew is a determining factor of the cost of maintenance.

Man hours required to complete annual maintenance tasks on the Schuylkill Trail in Montgomery County, PA, can be found on the AmericanTrails.org website: http://www.americantrails.org/resources/ManageMaintain/SchuylMaint.html

Regional Economy: Service and material costs vary widely between and even within regions. The Indiana Department of Transportation compiles a yearly summary of unit prices for all pay items included in the low, high, and average bids included in INDOT-awarded project contracts.[10] (This document is accessible through http://www.in.gov/dot/div/contracts/pay/)

Vandalism: Costs associated with acts of vandalism can be difficult to control; however, some design and maintenance practices can lower costs by discouraging vandalism. See, for example, preventive measures in Section 3.5: Graffiti.

Maintenance Practices: The degree to which routine preventive maintenance is practiced can greatly impact total costs, particularly by extending pavement life. See Figure 3.

Exposure Factors: A trail's particular weather and traffic exposure factors are major determinants of total maintenance costs. For example, the cost data from St. John's County, Florida (see Table 5) does not necessarily apply to trails in regions that do not receive as much sun or where winter weather can affect pavement condition by the use of de-icing materials.

Maintenance Requirements and Geography: Mobilization of a trail crew can be a major component of maintenance costs. Gaining access to trails to perform maintenance can be challenging and time-consuming. Engelmann writes that "maintaining trails entails different challenges than maintaining roads. For example, trails are narrow and may have been constructed with less sub-base support, so when heavy road maintenance equipment is used, that equipment may cause more damage than the repairs," and that consequently, many "contractors won't work on trails because their equipment is too heavy for trails or too large for narrow trail corridors."[11] Mobilization should therefore be a key component of contract negotiation. Solid pre-bid meetings should include checks on certifications and relevant experience, and discussion of a contractors' plan to sub-contract specialized jobs and gain access to the project area.

[9] 11/07/2014, Personal email communication with Amy Hartzog and Dawn Ritchie.

[10] INDOT, Pay Items

[11] Engelmann, "Preventive Maintenance"

Keeping variability in mind, the information in the following table might provide a useful baseline estimate. It should also provide incentive to practice preventive maintenance in order to delay and perhaps reduce costs of major reconstruction work.

Table 5. St. John's County Greenway Maintenance 2003 Cost Estimates

Maintenance Task	Task Type	Recommended Frequency	Cost
Routine maintenance: • Yearly facility evaluation to determine the need for minor repairs • Tree/brush clearing • Mowing • Map/signage updates • Trash removal/litter clean-up • Repair flood damage: silt clean-up, culvert clean-out, etc. • Patching, minor regrading, or concrete panel replacement • Planting, pruning, and general beautification • Installation and removal of seasonal signage	Routine	On-Going	$1,500 Annually
Sealcoating for 6-foot pedestrian trail	Minor Repairs	Every 5 years	$3,500 per mile
Sealcoating for 10-foot multi-use trail	Minor Repairs	Every 5 years	$5,800 per mile
Amenity replacement	Minor Repairs	As needed	On par with original costs
Resurfacing for 6-foot pedestrian asphalt trail	Major Reconstruction	Every 10 years	$7,920 per mile for 1-inch overlay
			$15,840 per mile for 2-inch overlay
Resurfacing for 10-foot multi-use asphalt trail	Major Reconstruction	Every 10 years	$13,200 per mile for 1-inch overlay
			$26,400 per mile for 2-inch overlay
Complete replacement, regrading, resurfacing	Major Reconstruction	Every 20 years	On par with original costs

Source: http://www.sjcfl.us/LAMP/media/SJC_GBT/trail_op_main_mgmt.pdf (pp 66-68)

St. John's County recommends that "trail operators should maintain records of the general costs of trail amenities as a means of estimating future repair and replacement costs. If custom elements such as lighting, decorative railings, or benches are used in trail design, the trail owner should consider ordering extra elements at the time of construction and storing them for future use, thereby defraying the cost of single-runs later."[12] However, experience along the Ohio River Greenway have shown that ordering supplies for anticipated future needs can be difficult when budgets are tight.

A best practice when purchasing new or replacement items is to procure items with the greatest life cycle cost and require the least amount of maintenance. Often these items may be more

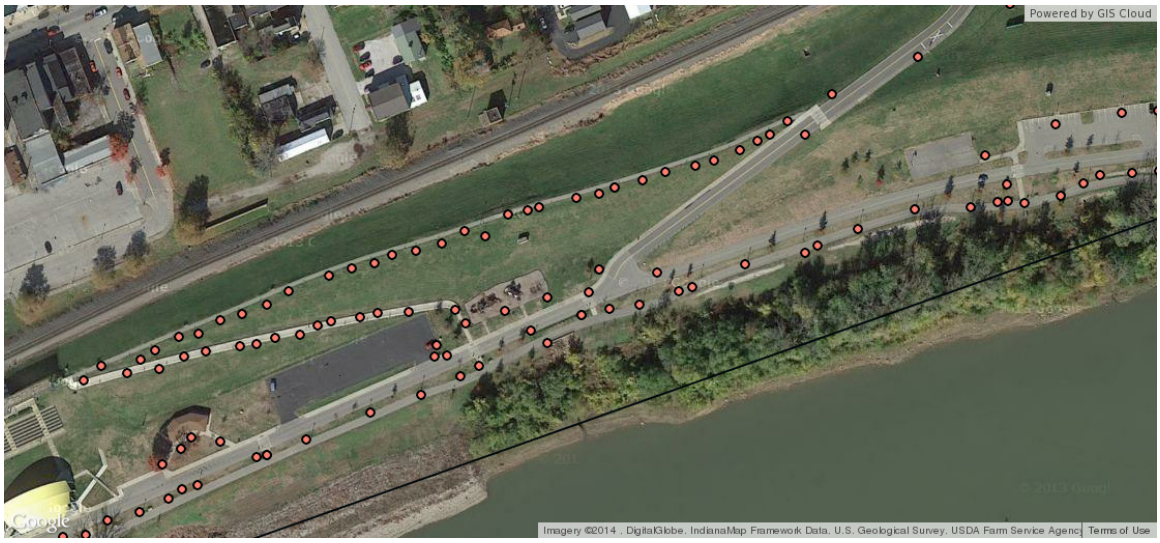
[12] St. John's County, p. 67

expensive up front, but can pay for themselves overtime. Factoring in such items during the planning phases, engineer estimates, and the grant proposal will help ensure getting the right assets incorporated at the right time, especially when funding is more likely to be available.

2.2 Technologies for Asset Management

An inventory of fixed assets on the Ohio River Greenway was created using GISCloud, a free, cloud-based software for collecting, mapping, and sharing geographical data. (GIS, which stands for Geographical Information Systems, is a standardized method of collecting and displaying geographic information.) While GISCloud is similar in function to well-known ArcGIS, it does not carry the cost of proprietary software, has a smoother learning curve, and allows for cloud-based, easily exportable data collection, representation, and sharing. Field data collection is accomplished using a mobile application (available for both Android and iOS) which shows the data fields that populate the spreadsheet. A GISCloud inventory can be used to facilitate maintenance functions ranging from the easy ordering of replacement bulbs to tracking real-time flooding or snow removal. An example of the early stages of this work is shown in the figure below; each dot represents an asset and corresponding data including location, condition, manufacturer, and maintenance jurisdiction.

Figure 2. Ohio River Greenway Features Inventory, Made with GISCloud Software



Source: Ohio River Greenway Inventory, 2014

GIS technology can be used to organize a variety of data and make it actionable. The PASER Cooperative Road Condition Survey Demonstration Project showed that "the combination of GIS, GPS and the PASER rating system is an excellent methodology for the rapid, accurate, and cost-effective collection of surface condition data…"[13]

Technology supporting the collecting of user-generated data is growing in popularity. Mobile applications that allow trail users to report concerns are a useful and increasingly common technology for gathering public safety data. Some of these applications are designed for city-wide concerns, while others are designed specifically for a trailway or parks system. While it is possible that allowing public reporting might obligate trail managers to respond to a number of uninformed complaints, user-supplied data can also increase information flows and response efficiency. Trail managers are obligated, legally and professionally, to prioritize maintenance issues wherever there are safety issues on a trail. Management of lighting, landscaping, debris, and pavement conditions is important for both public perception of trail security and actual public safety outcomes.

[13] Domonkos, PASER, p. 4

2.3 Considerations for Selecting Contractors

Liability, relevant skills and certifications, and resources are the three major considerations for selecting a contractor. While trails that are built with federal funding automatically fall under INDOT, bonding and insurance is also paramount for quoting out smaller contracts. One useful reference for setting up a good contract is the standard contract used by the City of Bloomington (see Appendix E). Key provisions of this contract are summarized in Table 6.

Table 6. City of Bloomington Contract Excerpts

	Required by
The Contractor is prohibited from subletting or assigning any portion of the contract.	Section 4.03.02
The Contractor must carry minimum insurance coverages, as specified in the contract.	Sections 4.05.01 - 4.05.05
The Contractor is responsible for providing the state with any certification, authorization, license, permit or registration that is required by local, state or federal law.	Section 4.06
The Contractor certifies all construction, materials of construction, and design work for one year from date of completion.	Section 4.09
The Contractor indemnifies the City and bonds all work at 100% of the contract amount.	Sections 4.01 and 4.12
Contractor must use domestically-produced steel in accordance with Indiana Code 5-16-8	Section 4.17
Contracted services are defined in Attachment A, "Scope of Work."	Section 4.04

Source: City of Bloomington, Sample Construction Contract Agreement

2.4 Prioritizing Maintenance Needs

Life cycle estimates for fixed assets can be helpful for anticipating maintenance requirements. Although variable exposure to the elements (intensity of sun exposure, pooling water, etc) and to traffic loads can greatly impact outcomes, the ranges shown below can give an idea of average life of asphalt pavement preservation treatments.

Table 7. Estimated Extended Life (years) for Preservation Surface Treatments for Asphalt Pavements

Treatment Type	**Existing Pavement Condition**		
	Good	***Fair***	***Poor***
Crack filling/ sealing	3-4	2-3	0-2
Chip and seal	6-8	4-6	3-4
Fog seal	4-5	1-4	Not Recommended
Slurry Seal	6-7	3-6	2-4
Thin Overlay	6-17	5-10	2-4
Scrub Seal	4-6	4-6	1-4

Source: USDOT, FHWA http://www.fhwa.dot.gov/preservation

Section 3: Quick Reference Maintenance Solutions

Several best-practice timetables for trailway maintenance tasks are readily available on the internet. One excellent online source for such a schedule is Table 16: Frequency of Common Maintenance Tasks, found in Appendix 2 of "Ensuring the Future of Your Trail – A Survey of 100 Rails-Trails."[14]

3.1 Traffic Control Devices: Signage and Markings

Signage and roadway markings are a critical part of trail user experience, providing safety and information.

Purpose: Provide for trail safety and information.

Best Practices: The Federal Highway Administration has established the Peer-to-Peer Program (P2P) as a resource for public-sector agencies that need help navigating the MUTC.[15]

Notes: *2011 Indiana Manual on Uniform Traffic Control Devices (Revisions 1& 2)*. The MUTCD is the national standard under US 23 Code of Federal Regulations 655.603, and it applies to all roads (including bikeways) in Indiana:

"The responsibility for the design, placement, operation, maintenance, and uniformity of traffic control devices shall rest with the public agency or the official having jurisdiction, or, in the case of private roads open to public travel, with the private owner or private official having jurisdiction. 23 CFR 655.603 adopts the MUTCD as the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel (see definition in Section 1A.13).

02 23 CFR 655.603 also states that traffic control devices on all streets, highways, bikeways, and private roads open to public travel in each State shall be in substantial conformance with standards issued or endorsed by the Federal Highway Administrator."[16]

3.2 Trash Removal and Sweeping

There are two approaches to managing trash accumulation on a trailway. The most common method is to establish a program of ongoing trash removal and as-needed debris management. The other is to institute a "carry in / carry out" policy in which trash cans are not provided and the public is asked to remove any trash generated while on the trailway. Rural Brown County State Park has pursued carry in / carry out with success, while the urban Falls of the Ohio State Park abandoned a similar policy based on poor outcomes, finding better results with a mixed approach of providing trash receptacles and removal for its parking and picnic areas and a carry in / carry out policy for its paths and fossil beds. Regardless of the preferred approach, the goals of trash and debris removal policies are the same: to improve public health and safety and enhance trial user experience. The primary reasons for implementing a street sweeping program are air and water quality control, access and appearance, and maintenance clean-up.

Purpose: Protect public health and safety, improve air and water quality, and improve trail user experience.

Best Practices: Design guidelines and maintenance notes for hazardous materials planning and response can be found in *Indiana Design Manual*, Ch. 51, 51-10.0 Hazardous Materials.[17]

Reasons for sweeping and types of sweepers are among the topics covered in *Resource for Implementing a Street Sweeping Best Practice*. The information can be adapted for trails.[18]

[14] Poole, *Ensuring the Future*, Appendix 2

[15] USDOT & FHWA, *Manual on Uniform Traffic Control Devices*

[16] INDOT, *2011 Indiana Manual*

[17] INDOT, *2013 Design Manual*

[18] Kuehl, *Resource for Implementing*

3.3 Vegetation / Erosion

Landscaping and erosion control are closely linked goals. Revegetation and planting in native vegetation can be particularly helpful in controlling erosion. Additionally, edging and weeding help maintain trail width, improve drainage, and prevent pavement heaving (i.e. pop-ups; see p. 31).[19]

Purpose: Control erosion, improve drainage, and protect trail width and surface.

Best Practices: Design guidelines and maintenance notes can be found in Indiana Design Manual, Ch. 51, Section 51-8.0 Landscaping.[20]

The University of Minnesota's *Best Practices Handbook on Roadside Vegetation Management* covers best practices in vegetation selection and control,mowing policies, snow drift control, and public relations.[21]

Notes: Berms that build up along the trail edge and uphill slopes should be monitored for erosion onto trails.

Environmentally safe solutions should be used for weeding. The proximity of the Ohio River Greenway to the Ohio River and its tributaries means that runoff of herbicides cannot be avoided, so weeding must be done by hand. Similarly, the US Army Corps of Engineers prohibits the use of herbicide on the levee.

Planting in low-mow or no-mow vegetation can significantly offset maintenance requirements, saving money and time while reducing environmental impact.

3.4 Graffiti

There are three elements to a solid graffiti control program: pretreating, deterrents, and removal.

Purpose: Enhance trail user experience, control vandalism cost, and discourage the "broken window" effect which can lead to additional property damage.

Best Practices: *Graffiti Removal and Prevention: What's Working for Bloomington Parks and Recreation* (included in Appendix D of this manual) describes the design choices, policies, and products that have been successfully used with to address graffiti in Bloomington, IN.[22]

3.5 Bridges

The value of a bridge includes the direct value of the asset itself as well as the access and continuity it provides.[23] As with road surfaces, preventive nonstructural maintenance can yield significant gains in the longevity of the asset (typically 30-50 years), postponing and reducing major structural rehabilitation or replacement costs.

Purpose: Extend the life-cycle of the asset, and prioritize public safety and access

Best Practices: Bridge owners should establish a program of inspection, condition rating, and preventive maintenance. The Federal Highway Administration Bridges and Structures webpage offers links to applicable legislation and policies, local examples of bridge preservation and maintenance programs, management best practices, and research and development.[24]

The American Public Works Administration (Preventive Maintenance Programs Keep Your Bridges Open for Years to Come) explains that the sufficiency level of a bridge (based on structural adequacy and safety, serviceability and functional obsolescence,

[19] Simpson, *Best Practices*

[20] INDOT, *2013 Design Manual*

[21] Johnson, *Best Practices Handbook*

[22] Williams, *Graffiti Removal*

[23] Herbst, Preventive Maintenance Programs

[24] USDOT, FHWA, Bridges and Structures

essentiality for public use, and special reductions) should be reported to the Federal Highway Administration and can be useful in developing a maintenance program like those highlighted in two case studies from Florida.[25]

The Greater Buffalo-Niagara Regional Transportation Council details best practices for bridge maintenance in the colder climate in the Erie-Niagara area. Cyclical Maintenance includes preventive measures such as bridge washing and debris clearing, deck sealing, steel bearings lubrication, and painting load-carrying steel members. Corrective Maintenance includes replacement of an element (joints, bearings, pedestals, bridge seat/pier cap, or columns/ stems) of a bridge that is otherwise in good structural condition.[26] The Bridge Maintenance Technical Guide (see pages 9 and 10 of the Guide) lays out the following maintenance activities schedules for Cyclical and Corrective measures:[27]

Cyclical Activity	Selection Criteria	Cycle
Bridge Washing (including substructure concrete, deck & crack sealing)	All functional structures regardless of CR, priority to structures over highways.	2 years
Deck Sealing (including crack & substructure concrete, sealing)	Concrete wearing surfaces (present wearing surface codes 02, 03, 06, 12, 22, 32, 42, 45, 52 in RC 15 of BDMS) rated ≥ 5.0 on structures rated 4.5 to 7. • 02 - Portland Cement concrete overlay • 03 - Precast Portland Cement Concrete Plank • 06 - Integral or Monolithic Portland Cement Concrete • 12 - Bonded Concrete • 22 - Concrete with membrane • 32 - High Density Concrete • 42 - Latex Modified Concrete • 45 - Micro-Silica Overlay • 52 - Class "HP" Concrete	6 years
Bridge Painting	Painted structures (coating types 1, 2 or 3 in RC 15 of BDMS) on structures rated 4.5 to 7. • 1 - Painted, Lead-Based • 2 - Painted, Not Lead-Based • 3 - Painted, Unknown	12 years
Deck Overlay	Wearing surfaces (present wearing surface codes 04, 14, 24, 34, 44, 54, 64 in RC 15 of BDMS) on structures rated 4.5 to 7. • 04 - Asphalt Concrete • 14 - Asphalt Concrete without Membrane • 24 - Asphalt Concrete with Membrane • 34 - Asphalt Concrete with Preformed Sheet Membrane • 44 - Asphalt Concrete with Coal Tar Epoxy Membrane • 54 - Asphalt Concrete with Membrane other than Coal Tar • 64 - Asphalt Concrete with Mastic Membrane	12 years

[25] Herbst, Preventive Maintenance Programs

[26] Greater Buffalo-Niagara Regional Transportation Council, p. 3

[27] Greater Buffalo-Niagara Regional Transportation Council, pp. 9-10

Corrective Activity	Selection Criteria	Objective
"5 – 7" Program	Bridges in generally good condition (Condition Rating > 4.8) that have individual structural elements that are deficient (Element Ratings < 5).	Repair the deficient element and thus extend the non-deficient life of the bridge.
"Vertical Down"	Structures with average condition rating between 4.8 and 6 with a substructure condition index ≤ 5.0.	Repair deficient substructures (i.e. bearings, pedestals, bridge seat/pier cap, columns/stems) where needed
"Joints"	Structures with average condition rating between 4.8 and 6 with joints (Joint Type codes 07, 11, 12, 13, 15, 16, 17, 18, 21, 22, 27, 28, 29, 30, 31, 32, 33, 34 in RC02 and RC15 of BDMS) rated ≤ 5.0. • Elastometric 07 - expansion 27 - fixed • Armored Elastometric 11 - expansion 28 - fixed • Armored Compression Seal 12 - expansion 29 - fixed • Compression Seal 13 - expansion 30 - fixed • Strip Seal with Integral Armoring Angle 15 - expansion 31 - fixed • Strip Seal – Extrusion Anchored to Deck, No Elastometric Concrete 16 - expansion 32 - fixed • Strip Seal – Extrusion Embedded in Elastometric Concrete 17 - expansion 33 - fixed • Strip Seal – Type Unknown 18 - expansion 34 – fixed • Sawed and Filled 21 - fixed • Filled, Elastic Material 22 - fixed	Repair deficient joints to prevent water and chlorides from falling onto substructure elements.

Notes: While bridge inspection is only federally mandated for vehicular bridges spanning more than 20 feet, all bridge owners should note that substantial public welfare and financial costs can result from deferred bridge maintenance.

3.6 Pavement

Pavement inspection and maintenance are the most important activities for ensuring trail safety and longevity. Many resources for evaluation of trail surface conditions, ranging from simple ratings systems to complicated integrated planning tools, are available for no cost online. Decisions about preventive maintenance and major reconstruction depend on a host of factors, including available funding and the age of the trail.

Purpose: The benefits of pavement preservation include extended pavement life and reduced long-term expenses through preventative maintenance. FP2 reports that every $1 spent on pavement preservation yields a savings on future rehabilitation or reconstruction of $6 to $10.[28] Additionally, Table 7 of Section 2.4 of this document provides the estimated lifecycle extensions for asphalt pavements that can be gained through recommended preventative maintenance applications.

An Indiana LTAP presentation on PASER - Pavement Management offers the following cost-benefit information (per mile of roadway):

Figure 3. Cost Effectiveness of Treatments

Fix Type	Cost ($ Per Mile)	Added Life ESL	Cost per Year of Added Life
Crack Seal	$4,000	1 yr.	$4,000
Seal Coat & CS	$20,000	4-9 yr.	$5,000
Overlay	$100,000	8-12 yr.	$12,500
Crush & Shape	$150,000	14 yr.	$10,700
Reconstruction	$300,000	15 yr.	$20,000

Source: Domonkos, Richard. (09/2014). PASER – Pavement Management. Indiana Local Technical Assistance Program. Prepared for 2014 AIC Annual Conference

Best Practices: A comprehensive pavement management system should evaluate four trail characteristics: roughness (ride), surface distress (condition), surface skid characteristics, and structure (pavement strength and deflection). Surface condition can be simply evaluated with the rating system outlined in the Asphalt PASER Manual.[29]

An Indiana LTAP presentation on PASER – Pavement Management shows the correlation of PASER rating and typical treatments:

Figure 4. Typical Treatments Tied to PASER Ratings

Rating 9 & 10	No Maintenance Required
Rating 8	Little or No Maintenance
Rating 7	Routine Maintenance – Crack Seal, Patching
Rating 5 & 6	Preservative Treatments – Sealcoat
Rating 3 & 4	Structural Improvement = Overlay / Recycle
Rating 1 & 2	Reconstruction

Source: Domonkos, Richard. (09/2014). PASER – Pavement Management. Indiana Local Technical Assistance Program. Prepared for 2014 AIC Annual Conference

[28] FP2, Why Pavement Preservation

[29] Walker, *Pavement Surface and Evaluation*

For planning purposes, a custom inventory which combines PASER ratings with other data (pavement type, width, length, etc.) can be created by using the Wisconsin Information System for Local Roads (WISLR) as a template.

Table 8. Sources of "Check Lists" for Asphalt Pavement Maintenance and Preservation Construction

Title	Website
Crack Seal Application	http://www.fhwa.dot.gov/pavement/preservation/ppcl01.cfm
Chip Seal Application	http://www.fhwa.dot.gov/pavement/preservation/ppcl02.cfm
Fog Seal Application	http://www.fhwa.dot.gov/pavement/preservation/ppcl04.pdf
Thin Hot Mix Application	http://www.fhwa.dot.gov/pavement/preservation/ppcl03.pdf
Slurry Seal Application	http://www.fhwa.dot.gov/pavement/preservation/ppcl13.cfm

Source: FHWA: http://www.fhwa.dot.gov/preservation

The Pavement Preservation Checklist Series is available as a mobile app through the Google Play store or the iTunes App store. Additionally, FP2 maintains a helpful "Preservation Toolbox" link on their website homepage that is organized by topic.[30]

Pavement preservation methods can be categorized as nonstructural preventive maintenance (including surface treatments like slurry surfacing, crack sealing, chip sealing, micro surfacing, rejuvenation, hot and cold in-place recycling and thin-lift hot-mix asphalt paving) or structural preservation.[31]

The following is a maintenance check schedule from Best Practices for Bicycle Trail Pavement Construction and Maintenance in Illinois (p.34):

Table 9. PCC-Surfaced Trail Maintenance Recommendations

Maintenance Task	Maintenance Interval (years)
Check drainage components for proper function, no pooling water	1
Identify and complete joint crack sealing	6
Identify and complete patching	6

Source: https://www.ideals.illinois.edu/bitstream/handle/2142/45812/FHWA-ICT-12-009.pdf?sequence=2

Solutions: Surface deterioration can be corrected with fog seal, seal coat, slurry seal, or micro surfacing. Engelmann notes that "each of these treatments is successively more costly but also lasts longer. Fog sealing is least expensive, yields a smooth surface, and lasts four to six years. Seal coating costs more than fog sealing but lasts 6 to 10 years. Slurry sealing is a bit more costly than seal coating and lasts a little longer. Micro surfacing is most expensive and has an 8 to 10 year lifespan."[32]

[30] FP2, Home

[31] FP2, Home

[32] Engelmann, "Preventive Maintenance for Recreational Trails"

Table 10. INDOT Standard Materials for Seal Applications

INDOT Standard Specification's Section	Application	Asphalt Emulsion or Paving Grades
404	Seal Coat	RS-2, AE-90, AE-90S, or HFRS-2
408	Sealing Cracks	AE-90, AE-90S, AE-150, or PG64-22
412	Fog Seal	AE-F

Source: http://www.in.gov/indot/files/INDOT_Treatment_Guidelines_for_Pavement_Preservation.pdf

Complete replacement can mean installing a new crushed limestone surface, completely overlaying a crushed limestone or asphalt trail with a new asphalt surface, or replacing of an asphalt trail with a concrete trail. Costs should be on par with the original construction costs, though crew mobilization might be an added complication.[33]

Providers in Indiana can be found by searching the IRMCA (Indiana Ready Mix Concrete Association) directory. This directory is available in printable format at http://www.irmca.com/sites/default/files/bin/imagecache/slide/images/irmca.print_.directory.pdf. A companion application, IRMCA Directory App, is available for Android and iOS platforms.

Notes: Several agencies and industry groups, including the U.S. Green Building Council and the National Ready Mix Concrete Association (NRMCA), are promoting the use of pervious concrete pavement for trails and paths to mitigate issues of pollutant run off and tree root heaving. NRMCA has developed design, construction, and maintenance procedures as well as certification training programs for producers and contractors.

Several studies report that maintenance costs are lower for porous pavements than for standard asphalt trails. An accounting of costs from a Wisconsin trailway concludes that "by reducing the need for winter plowing, labor, and equipment, Middleton's cost savings amount to $3,500 per year compared to regular asphalt trails. Maintenance costs for the crushed rock trail are about $5,000 per year compared to only $300 per year for the porous pavement. The trail is cleaned a couple of times a year with sweepers or blowers to remove accumulations of leaves or dirt.

Additionally, there is support for using "porous asphalt as an overlay for existing asphalt trails that have begun to deteriorate. While the old impermeable layer will not let much moisture through, the real benefit is the flexibility of the porous overlay. Even where unstable soils keep shifting the trail base, cracks do not seem to show through the top layer of porous asphalt."[34]

The Director of the Luray-Hawksbill Greenway in Virginia notes that routine maintenance for porous pavements includes bi-annual vacuuming to remove accumulations of dirt and debris, annual vacuuming and fine gravel replacement, and weekly to monthly sweeping or blowing.[35]

See Appendix B for additional information on porous pavements.

[33] St. John's County, *Greenway, Blueway, and Trails Master Plan*

[34] Macdonald, Porous Asphalt Shows Advantages

[35] Beard, Permeable Pavement Benefits

3.7 Seasonal Issues

Snow, ice, and flooding can pose serious seasonal threats to the integrity of the trail pavement and to trailway access. According to FP2, "Poor drainage is the single most common problem that leads to premature failures on all types of pavements. It can be responsible for rutting, cracking, potholes, erosion, washouts, heaving and flooding and eventual premature roadway failure. Estimated life extension: 5-20 years."[36]

Balancing public safety with environmental stewardship and efforts to control maintenance costs can be challenging, as many of the popular deicing products contain harmful agents (calcium and magnesium chloride, particularly) that can leach into the surrounding landscape and can damage pavement integrity over time. Operators of privately-funded trails can weigh these competing goals when setting a winter weather policy; conversely, trails that are constructed with federal funds must be kept clear and passable, as mandated by several federal regulations, including the Americans With Disabilities Act. Exceptions to this requirement are made for situations (for example, an ice storm or a flood) which pose a public hazard, as determined by local authorities; in these scenarios, local authorities may close the trailway until the hazard is resolved. However, not having a maintenance program in place to address routine inclement weather conditions is not grounds for trailway closure.[37]

Purpose: Ensure public access and protect the trail pavement.

Best Practices: Minnesota LTAP's *Minnesota Snow and Ice Control Handbook* covers preparations in advance of snow and ice events, as well as removal options.[38]

The Winter Parking Lot and Sidewalk Maintenance Manual has detailed information (including cost estimates and product information) for deicing and other removal options.[39]

"Drainage Maintenance and Repair" offers concise information on the actions needed to protect pavement from ground water and rain.[40]

Indiana Drainage Handbook offers in-depth review of best practices and applicable policies.[41]

Note: Correcting drainage problems can cause unintended problems, particularly near slopes where improved drainage can result in slope erosion.

Costs for snow removal can vary dramatically. A Milwaukee study reports that "Snow removal costs range from $24.13/mile on the Glacial Drumlin Trail - E to $154.13/mile on the Red Cedar State Trail."[42]

For more on environmental impacts of deicers, see Stanko et al. "Do Road Salts Cause Environmental Impacts?"

Porous pavements require little or no salt application and suffer minimal surface damage from freezing weather conditions. The primary reason is that the design does not allow water to accumulate and freeze. A study from Wisconsin notes that, "…ice and snow tended to linger on the traditional surfaces while melting away quickly on the porous asphalt surface. Apparently as some melting takes place during the day, the water re-freezes on the impervious asphalt. The porous material is able to absorb a great deal of water as it melts, gradually leaving the surface ice-free."[43] A report for the Luray-Hawksbill Greenway in Virginia notes that porous pavement does not require annual maintenance such as crack sealing, and that plowing is a sufficient response to winter weather.[44]

[36] FP2, Drainage Maintenance and Repair

[37] 10/29/2014, Private Communication with Michael Cales

[38] Minnesota LTAP, *Minnesota Snow and Ice Control*

[39] Dindorf, *Winter Parking Lot and Sidewalk Maintenance*

[40] FP2, *Drainage Maintenance and Repair*

[41] Indiana DNR, *Indiana Drainage Handbook*

[42] Milwaukee County, Construction and Maintenance Costs

[43] Macdonald, Porous Asphalt Show Advantages

[44] Beard, Permeable Pavement Benefits

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Appendix A: Ohio River Greenway Commission

Table A1. ORGC Advisory Committees

Title	Function
Steering Committee	Set agenda for ORGC
Design and Construction	Consult on technical design and construction issues
Community Outreach / Friends of the Greenway	Coordinate volunteers and community events.
Finance and Funding	Pursue funding

Table A2. Members of the Ohio River Greenway Commission, October 2014

Name	Position
Clarksville	
Patrick Duggins	Clarksville Appointee
Jim McCoskey	Clarksville Appointee
Bob Polston	Clarksville President Town Council
New Albany	
Unappointed (10/27/14)	New Albany Appointee
Jeff Gahan	New Albany Mayor
Pat Leist-Stumler	New Albany Appointee; ORGC Treasurer
Jeffersonville	
David Boome	Jeffersonville Appointee; ORGC Vice-Chair
Philip Hendershot	Jeffersonville Appointee; ORGC Chair
Mike Moore	Jeffersonville Mayor
Non-voting Members	
Wendy Dant Chesser	One Southern Indiana
Jim Epperson	Southern Indiana Tourism Bureau
Matt Hall	One Southern Indiana
Kelly Morgan	DNR – Falls of the Ohio
Jim Ude	INDOT
Governor's Appointees	
Jay G. Conner	Clark County Appointee
Ed Jerdonek	Floyd County Appointee
Staff	
Meredith Gainer	Administrative Assistant
Shaunna Graf	Project Director
USACE	
Jim Childs	Construction Manager
Carol Labashosky	Public Affairs Officer
Matt Schueler	Project Manager

Appendix B: Additional Resources

Additional Information on Pavement Maintenance

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Asphalt Pavement Preventative Maintenance Videos

Craftco crack sealing instruction manual: https://www.youtube.com/watch?v=53uVzix9WKo

Crack sealing asphalt pavement (part 1): https://www.youtube.com/watch?v=if9Pw4julG8

Crack sealing asphalt pavement (part 2): https://www.youtube.com/watch?v=jnjfr-twWjw

Crack repair in asphalt concrete pavement: https://www.youtube.com/watch?v=g50xu7jl6Kw

Preventative maintenance: https://www.youtube.com/watch?v=51YLS6WBmnI

Slurry seal Kuihelani Hwy, Maui, HI: https://www.youtube.com/watch?v=a9qJoRFQYMU

PASS scrub seal, City of Vista: https://www.youtube.com/watch?v=U7BOen-nAsA

Microsurfacing project, western emulsions: https://www.youtube.com/watch?v=gJU71Jy6ckk

Chip seal application (LTAP): https://www.youtube.com/watch?v=X8PY0WX9__s

IRMCA App Directory

https://play.google.com/store/apps/details?id=edu.purdue.irmca.directory

https://itunes.apple.com/us/app/indiana-ready-mix-concrete/id776122426?mt=8

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Asset Management Tools

Eppley Institute for Parks and Public Lands. (2014). http://eppley.org/category/resources/tools/

Winter Weather Maintenance Best Practices

Cebe, J. (2014, February). Winter bike lane maintenance: A review of national and international best practices. *Perspectives in planning white paper 2*(1). Alta Planning + Design. http://www.altaplanning.com/wp-content/uploads/winter-bike-riding-white-paper-alta.pdf

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Estimated Costs (Including Man Hours) Required for Maintenance Activities

McCormick, T., & Assoc. (2007, April 16). Maintenance costs for the Schuylkill trail. *American Trails, Trails Maintenance and Management*. http://www.americantrails.org/resources/ManageMaintain/SchuylMaint.html

Recommended Maintenance Schedules and Scheduling Templates

Greenways, Inc., & Arbor Engineering. (2007, August). Chapter 6: Operations and maintenance, section 6.3 routine and remedial maintenance. *Trails & greenways master plan*. http://www.greenvillesc.gov/PlanningZoning/MasterPlans.aspx

Public Sector Consultants, Inc. (2007, March). Appendix B: Frequency of maintenance activities. *Statewide greenways maintenance inventory and case studies*. Michigan Trails and Greenway Alliance. http://www.michigantrails.org/sites/default/files/statewide-trails-maintenance-inventory-and-case-studies.pdf

Comparisons of Available Trail Surfacing Options

Anasazi Trails. (2014). *Rio Grande trail corridor study: Trail surfacing report. American Trails*. http://www.americantrails.org/resources/trailbuilding/Rio-Grande-Trail-Surfacing.html

Comprehensive Manual on Policies and Practices for Pedestrian Facilities Maintenance USDOT & FHWA. (2013, October). *A guide for maintaining pedestrian facilities for enhanced safety.* http://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa13037/

Appendix C: Assets Inventory

Table C1. Template for Taking an Inventory of Ohio River Greenway Assets

Asset	Make/Model	Supplier	Photo	Maintenance Notes	Jurisdiction
Trash can					
Bollard					
Limestone wall					
Bench					
Water Fountain					
Picnic Bench					
Restroom					
Lighting					
Handrail					
Safety and Informational Sign					
Pavement Markings					
Pavement					
Parking Lots					
Tree Canopy					
Landscaping					
Culverts					
Bridges					
Retaining Walls					

Appendix D: Bloomington, IN, Parks and Recreations Graffiti Removal and Prevention Program

Graffiti Removal and Prevention
What's Working for Bloomington Parks and Recreation

Bloomington Parks and Recreation, like many urban park departments, is challenged with frequent incidents of graffiti on its trails and other facilities. Substantial resources in labor, equipment, and materials are expended toward our graffiti removal and prevention program. We subscribe to the "broken window" philosophy; when damage caused by graffiti or vandalism is not attended to immediately it can create a negative impression to the public that no one cares, and the site will continue to be vandalized. We also find that rapid response can result in graffiti taggers going elsewhere, knowing their work may not be on display for an extended period of time at our facilities.

Design Details and Detterents
Pay attention to the details of your trail's design; especially vertical elements (light poles, signs and sign posts), site furniture, building exteriors and finishes, and signage.

- Consider "fluted" poles for lighting, sign posts, and other trail features. From our experience, fluted (vs. smooth metal or wood surfaces) poles are more difficult to attach stickers and signs and are less frequently tagged.
- Consider using the color black for site amenities such as trash receptacles, benches, and tables. If multiple manufacturers of site furniture are used, there will be subtle differences in the same color of blue, green, etc. This can make covering over the graffiti by painting a more difficult task, often requiring an inventory of several different color shades of paint. The color black is standard regardless of manufacturer, and cans of paint or spray paint in different sheens are readily available at the local hardware store.
- Be careful with site furniture that has expansive smooth, flat, surface areas prone to being tagged more frequently. Consider slatted steel benches over other materials. When purchasing tables, consider designs that have perforated, slatted, or punched hole seats and tops.
- When using limestone, consider using "rock face" or roughened surfaces to deter graffiti. Tagging on smooth limestone, due to its porosity, can be very difficult to remove.
- Painting the backside of stop signs and other signage black can deter tagging, and if tagged, makes covering over with spray paint an easier task.
- For expansive exterior surfaces such as building exteriors, retaining walls, and bridges, consider employing an artist to create artwork or a mural. We have found this to be a cost effective deterrent to graffiti on frequently tagged outdoor facilities such as restrooms, as artwork by others may be left alone by taggers.
- When using informational or interpretive signage, consider products that feature a high pressure layered laminate process that helps preserve the sign image when graffiti removal products are used.

Removal Products and Equipment
We have tested numerous graffiti removal products and have settled in on three products. The active ingredients in the products listed below are likely available from numerous other manufacturers. It's critically important that staff who use these products read the labels and wear personal protection equipment such as gloves and eye protection. The key to any removal is a rapid response. The longer the tag is allowed to remain on the surface, the more difficult it can be to remove.

- *Elephant Snot*. Manufactured by: Momar-Atlanta GA
    - Apply product with a good quality paint brush. This product works best in temperatures above 45 degrees. Let the product set for 45 minutes and remove with a pressure washer using hot water. Excellent for removal of graffiti on limestone.

- *Mark Off*. Manufactured by: Momar-Atlanta GA
  - Excellent product for removal of graffiti from markers, crayons, or paint.
  - Spray on surface and let set for minute; wipe off. May require a repeat application. Product can also be removed with high pressure water.
- *Blister*. Manufactured by: Momar-Atlanta GA
  - Works well on stone, brick, and other masonry surfaces. Spray on and let set for three minutes. Remove by using a pressure washer using hot water. Product works as a paint stripper and is also effective for removal of decals and stickers.
- We use a trailer mounted pressure washer unit with heated water for most removals and find this piece of equipment to be critical important to our efforts. These rigs are expensive (~$7,500), but the combination of heated water and high pressure water works extremely well and causes minimal, if any, damage to the tagged surface.

Appendix E: Bloomington, IN, Sample Construction Contract Agreement

CITY OF BLOOMINGTON
parks and recreation

AGREEMENT

BETWEEN

The City of Bloomington, Indiana
Department of Parks and Recreation

AND

----------.

FOR

PROJECT NO. BPR---------

THIS AGREEMENT, executed by and between the City of Bloomington, Indiana, Board of Parks Commissioners (hereinafter CITY), and ---------- (hereinafter CONTRACTOR);

WITNESSETH THAT:

WHEREAS, CITY is desirous of ----------(more particularly described in Attachment A, "Summary of Work:"; and

WHEREAS, CONTRACTOR is capable of performing all applicable work for ----------; and

WHEREAS, said proposal was determined to be the lowest responsible and responsive proposal for said project.

NOW, THEREFORE, in consideration of the mutual promises hereinafter enumerated, the parties agree as follows:

ARTICLE 1. TERM

1.01 This Agreement shall be in effect upon execution of this Agreement by all parties.

ARTICLE 2. SERVICES

2.01 CONTRACTOR shall complete all work required under this Agreement within **--calendar days from the written Notice to Proceed.** Substantial Completion shall be considered to be completion of all work.

2.02 It is hereby understood by both parties that time is of the essence in this Agreement. Failure of CONTRACTOR to complete all work as herein provided will result in monetary damages to CITY. It is hereby agreed that CITY will be damaged for every day the work has not been performed in the manner herein provided and that the measure of those damages shall be determined by reference to the then current INDOT Schedule of Liquidated Damages for Each Day of Overrun in Contract Time. CONTRACTOR agrees to pay CITY said damages or, in the alternative, CITY, at its sole discretion, may withhold monies otherwise due CONTRACTOR. It is expressly understood by the parties hereto that these damages relate to the time of performance and do not limit CITY's other remedies under this Agreements, or as provided by applicable law.

2.03 CONTRACTOR agrees that no charges or claims for damages shall be made by him for any delays or hindrances, from any cause whatsoever during the progress of any portion of the services specifies in the Agreement. Such delays or hindrances, if any, may be compensated for by an extension of time for reasonable period as may be mutually agreed upon between the parties, it being understood, however, that permitting of CONTRACTOR to proceed to complete any service, or any part of the, after the date to which the time of completion may have been extended, shall in no way operate as a waiver on the part of CITY or any of its rights herein.

ARTICLE 3. COMPENSATION

3.01 CONTRACTOR shall provide services as specified in Attachment A, "Scope of Work", attached hereto and incorporated into this Agreement.

3.02 Upon the submittal of approved claims, CITY shall compensate CONTRACTOR in lump sum of **----------. ($#######).** CITY may withhold payment, in whole or in part to the extent necessary to protect itself from a loss on account of any of the following:

1. Defective work.
2. Evidence indicating the probable filing of claims by other parties against CONTRACTOR which may adversely affect CITY.
3. Failure of CONTRACTOR to make payments due to subcontractors, material suppliers or employees.
4. Damage to CITY or a third party.

3.03 The submission of any request for payment shall be deemed a waiver and release by CONTRACTOR of all liens and claims with respect to the Work and period to which such payment request pertains except as specifically reserved and noted on such request.

3.04 CONTRACTOR shall maintain proper account records for the scope of all services of this Agreement and provide an accounting for all charges and expenditures as may be necessary for audit purposes. All such records shall be subject to inspection and examination by CITY's representatives at reasonable business hours.

3.05 CONTRACTOR shall submit time sheets (WH-347) for his own and all subcontracted employees, to City Contract Compliance Officer or his/her representative for approval and review, including review for compliance with Prevailing Wage requirements, if applicable to the project.

ARTICLE 4. GENERAL PROVISIONS

4.01 CONTRACTOR agrees to indemnify and hold harmless CITY and its officers, agents, officials and employees for any and all claims, actions, causes of action, judgments and liens arising out of and negligent act or omission by CONTRACTOR or any of its officers, agents, officials, employees, or subcontractors or any defect in materials or workmanship of any supply, materials, mechanism or other product or service which it or any of its officers, agents, officials, employees, or subcontractors has supplied to CITY or has used in connection with this Agreement and regardless of whether or not it is caused in part by a party indemnified hereinunder. Such indemnity shall include attorney's fees and all costs and other expenses arising therefrom or incurred in connection therewith and shall not be limited by reason of the enumeration of any insurance coverage required herein.

4.02 Abandonment, Default and Termination

4.02.01 CITY shall have the right to abandon the work contracted for in this Agreement without penalty. If CITY abandons the work described herein, CONTRACTOR shall deliver to CITY all surveys notes, drawings, specifications and estimates completed or partially completed and these shall become the property of CITY. The earned value of

the work performed shall be based upon an estimate of the proportion between the work performed by CONTRACTOR under this Agreement and the work which CONTRACTOR was obligated to perform under this Agreement. This proportion shall be mutually agreed upon by CITY and CONTRACTOR. The payment as made to CONTRACTOR shall be paid as a final payment in full settlement of his services hereunder.

4.02.02 If CONTRACTOR defaults or fails to fulfill in a timely and proper manner the obligations pursuant to this Agreement, CITY may, after seven (7) days written notice to has been delivered to CONTRACTOR, and without prejudice to any other remedy it may have, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due to CONTRACTOR. In the alternative, CITY, at its option, may terminate this Agreement and take possession of the site and of all materials, equipment, tools and construction equipment and machinery thereon owned by CONTRACTOR, and may finish the project by whatever method it may deem expedient, and if the such action exceeds the unpaid balance of the sum amount, CONTRACTOR or his surety, shall pay the difference to CITY.

4.02.03 Default: If CONTRACTOR breaches this Agreement or fails to perform the work in an acceptable manner, he shall be considered in default. Any one or more of the following will be considered a default:

1. Failure to begin the work under this Agreement within the time specified.
2. Failure to perform the work with sufficient supervision, workmen, equipment and materials to insure prompt completion of said work.
3. Unsuitable performance of the work as determined by the Parks and Recreation Department Administrator or his/her representative.
4. Neglecting or refusing to remove defective materials or failure to perform anew such work as shall have been rejected.
5. Discontinuing the prosecution of the work or any part of it.
6. Inability to finance the work adequately.
7. If, for any other reason, CONTRACTOR breaches this Agreement or fails to carry on the work in an acceptable manner.

4.02.04 CITY shall send CONTRACTOR a written notice of default. If CONTRACTOR, or his Surety, within a period of ten (10) days after such notice, fails to remedy the default, then CITY shall have full power and authority, without violation of the Agreement, to take the prosecution of the work out of the hands of said CONTRACTOR, to appropriate or use any or all materials and equipment on the ground as may be suitable and acceptable, and may at his option, turn the work over to the Surety, or enter into an agreement with another Contractor for the completion of the Contract according to the terms and provisions thereof, or CITY may use such other methods as, in its opinion, shall be required for the completion of said Contract in an acceptable manner.

4.02.05 All cost of completing the work under the Contract shall be deducted from the monies due or which may become due said CONTRACTOR. In case the expenses so

incurred by CITY shall be less than the sum which would have been payable under the Contract if it had been completed by said CONTRACTOR, CONTRACTOR shall be entitled to receive the difference. However, in case such expense shall exceed the sum which would have been payable under the Contract, CONTRACTOR and his Surety will be liable and shall pay to CITY the amount of said excess. By taking over the prosecution of the work, CITY does not forfeit the right to recover damages from CONTRACTOR or his Surety for his failure to complete the work in the time specified.

4.02.06 Notwithstanding any other provision of the is Agreement, if funds for the continued fulfillment of the Agreement by CITY are at any time not forthcoming or are insufficient, through failure of any entity to appropriate the funds or otherwise, then CITY shall have the right to terminate this Agreement without penalty by giving prior written notice documenting the lack of funding in which instance unless otherwise agreed to by the parties, this Agreement shall terminate and become null and void on the last day of the fiscal period for which appropriation were received.

4.02.07 CITY agrees that it will make its best effort to obtain sufficient funds, including but not limited to, including in its budget for each fiscal period during the term hereof a request for sufficient funds to meet its obligations hereunder in full.

4.03 Successors and Assigns

4.03.01 Both parties agree that for the purpose of this Agreement, CONTRACTOR shall be an Independent Contractor and not an employee of CITY.

4.03.02 No portion of this Agreement shall be sublet, assigned or otherwise disposed of by CONTRACTOR except with the written consent of the CITY being first obtained. Consent to sublet, assign, or otherwise dispose of any portion of this Agreement shall not be construed to relieve CONTRACTOR of any responsibility of the fulfillment of this Agreement.

4.04 Extent of Agreement: Integration

4.04.01 This Agreement consists of the following parts, each of which is as fully a part of this Agreement as if set out herein:

1. This Agreement
2. Technical Specifications (Attachment A, “Scope of Work)
3. Where applicable, Bid/Quote Prices (Attachment B)
4. Upfront Specifications (Definitions and Bidder's Responsibilities – not applicable for this agreement)
5. CONTRACTOR’s submittals (not applicable for this agreement)
6. Federal Wage Requirements (not applicable)

4.04.02 In resolving conflicts, errors, discrepancies and disputes concerning the Scope of Work to be performed by CONTRACTOR, and other rights and obligations of CITY and CONTRACTOR, the document expressing the greater quantity, quality or other scope of

work in question, or imposing the greater obligation upon CONTRACTOR and affording the greater right or remedy to CITY shall govern; otherwise the documents shall be given precedence in the order as enumerated above.

4.05 Insurance

4.05.01 CONTRACTOR shall, as a prerequisite to this Agreement, purchase and thereafter maintain such insurance as will protect him from the claims set forth below which may arise out of or result from CONTRACTOR's operations under this Agreement, whether such operations be by CONTRACTOR or by any SUBCONTRACTORS or by anyone directly or indirectly employed by any or them, or by anyone for whose acts any of them maybe liable:

Coverage		Limits
A.	Workmen's Compensation & Disability	Statutory Requirements
B.	Employer's Liability Bodily Injury by Accident	$100,000 each accident
	Bodily Injury by Disease	$500,000 policy limit
	Bodily Injury by Disease	$100,000 each employee
C.	Commercial General Liability (Occurrence Basis) Bodily Injury, personal injury, property damage, contractual liability, products-completed operations, General Aggregate Limit (other than Products/Completed Operations)	$1,000,000
	Products/Completed Operation	$1,000,000
	Personal & Advertising Injury Limit	$1,000,000
	Each Occurrence Limit	$1,000,000
	Fire Damage (any one fire)	$50,000
	Medical Expense Limit (any one person)	$5,000
D.	Comprehensive Auto Liability (single limit, owned, hired and non-owned)	$1,000,000 each accident
	Bodily injury and property damage	$1,000,000

E.	Umbrella Excess Liability	$2,000,000 each occurrence and aggregate
	The Deductible on the Umbrella Liability shall not be more than	$10,000

4.05.02 CONTRACTOR's comprehensive general liability insurance shall also provide coverage for the following:

1. Premises and operations;

2. Contractual liability insurance as applicable to any hold-harmless agreements.

3. Completed operations and products; which also must be maintained for a minimum period of two years after final payment and CONTRACTOR shall continue to provide evidence of such coverage to city on an annual basis during the aforementioned period; and

4. Broad form property damage - including completed operations;

5. Fellow employee claims under Personal Injury;

6. Independent Contractors.

4.05.03 With the prior written approval of CITY, CONTRACTOR may substitute different types or amounts of coverage for those specified as long as the total amount of required protection is not reduced.

4.05.04 Certificates of Insurance, naming the City of Bloomington as an "additional insured", showing such coverage then in force (but not less than the amount shown above) shall be on file with CITY prior to commencement of work. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled or non-renewed until at least sixty (60) days prior written notice has been received by CITY.

4.06 **Necessary Documentation** CONTRACTOR certifies that it will furnish CITY any and all documentation, certification, authorization, license, permit or registration required by the laws or rules and regulations of the City of Bloomington, the State of Indiana and the United States. CONTRACTOR further certifies that it is now and will maintain in good standing with such governmental agencies and that it will keep its license, permit registration, authorization or certification in force during the term of this Agreement.

4.07 **Applicable Laws** CONTRACTOR agrees to comply with all federal, state, and local laws, rules and regulations applicable to CONTRACTOR in performing work pursuant to this Agreement, including, but not limited to, discrimination in employment, prevailing wage laws, conflicts of interest, public notice, accounting records and requirements. Unless otherwise specified, this Agreement shall be govern by the laws of the United

States, and the State of Indiana, and by all Municipal Ordinances and Codes of the City of Bloomington.

4.08 Non-Discrimination

4.08.01 CONTRACTOR and subcontractors shall not discriminate against any employee or applicant for employment, to be employed in the performance of this Agreement, with respect to hire, tenure, terms, training, conditions or privileges of employment, because of race, sex, color, religion, national origin, ancestry, age, handicap, or disabled veteran status. Breach of this covenant may be regarded as a material breach of the Agreement.

4.08.01 CONTRACTOR certifies for itself and all its subcontractors compliance with exiting laws of the State of Indiana and the United States regarding:

1. Prohibition of discrimination in employment practices on the basis of race, sex, color, religion, national origin, ancestry, age, handicap, or any other legally protected classification;

2. The utilization of Minority and Women Business Enterprises. CONTRACTOR further certifies that it:

   a. Has formulated its own Affirmation Action plan for the recruitment, training and employment of minorities and women, including goals and timetable; which has been approved by the City's Contract Compliance Officer.

   b. Strongly encourages the use of small business, minority-owned business and women-owned business in its operations.

4.08.03 FURTHER, PURSUANT TO IC 5-16-6-1, CONTRACTOR AGREES:

A) That in the hiring of employees for the performance of work under this Agreement or any subagreement hereunder, no contractor, or subcontractor, nor any person acting on behalf of such CONTRACTOR or subcontractor, shall be reason of race, sex, color, religion, national origin, ancestry, or any other legally protected classification, discriminate against any citizen of the State of Indiana who is qualified and available to perform the work to which the employment relates.

B) That no contractor, subcontractor, or any person of their behalf, shall, in any manner, discriminate against or intimidate any employee hired for performance of work under this Agreement on account or race, religion, color, sex, national origin, ancestry, handicapped, or any other legally protected classification.

C) That there may be deducted from the amount payable to CONTRACTOR, by CITY, under this Agreement, penalty of Five Dollars ($5.00) for each person for each

calendar day during which such person was discriminated against or intimidated in violation of the provisions of this Agreement. Any such person discriminated against retains the right to file a discrimination complaint with the appropriate civil rights agency or court.

D) That this Agreement may be canceled or terminated by CITY and all money due or to become hereunder may be forfeited, for a second or any subsequent violations of the terms or conditions under this section of the Agreement.

4.09 Workmanship and Quality of Materials

4.09.01 CONTRACTOR shall guarantee the work for a period of one (1) year form the date of substantial completion. Failure of any portion of the work within one (1) year due to improper construction, materials of construction, or design may result in a refund to CITY of the purchase price of that portion which failed or may result in the forfeiture of CONTRACTOR's Performance Bond.

4.09.02 OR EQUAL: Wherever in any of the Contract Documents an article, material or equipment is defined by describing a proprietary product, or by using the name of a manufacturer or vender, the term "Or Equal" or the term "The Equivalent" if not inserted, shall be implied, and it is done for the express purpose of establishing a basis of durability and efficiency and not for the purpose of limiting completion. Whenever material or equipment is submitted for approval as being equal to that specified, the submittal shall include sufficient information and data to demonstrate that the material or equipment conforms to the Contract requirements. The decision as to whether or not such material or equipment is equal to that specified shall be made by the Parks and Recreation Department Administrator or his/her representative. The approval by the ADMINISTRATOR of alternate material or equipment as being equivalent to that specified, shall not in any way relieve CONTRACTOR of responsibility for failure of the material or equipment due to faulty design, material, or workmanship, to perform the function required by the Contract Documents.

4.09.03 CITY shall be the sole judge of the sufficiency of workmanship and quality of materials. Disputes shall be resolved by the Parks and Recreation Department Administrator and are not subject to arbitration.

4.10 Safety. CONTRACTOR shall be responsible for the safety of employees at all times and shall provide all equipment necessary to insure their safety. CONTRACTOR shall ensure the enforcement of all applicable safety rules, regulations, ordinances and laws, whether federal, state or local.

4.11 Amendments/Changes

4.11.01 Except as provided in Paragraph 4.11.02, this Agreement may be amended only by written instrument signed by both CITY and CONTRACTOR.

4.11.02 Without invalidating the Agreement and without notice to any surety, CITY may at any time or from time to time, order, in writing, additions, deletions or revisions in the Work. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents.

4.11.03 If CONTRACTOR believes that any direction of CITY under paragraph 4.11.02, or any other event or condition, will result in an increase in the Contract time or price, he shall file written notice with CITY no later than twenty (20) days after the occurrence of the event giving rise to the claim and stating the general nature of the claim with supporting data. No claim for any adjustment of the Contract time or price will be valid if not submitted in accordance with this Paragraph.

4.11.04 CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with CITY. No work shall be delayed or postponed pending resolution of any dispute or disagreement except as CONTRACTOR and CITY may otherwise agree in writing.

4.12 Performance Bond and Payment Bond

4.12.01 CONTRACTOR shall provide CITY with a Performance Bond and Payment Bond in the amount of one hundred percent (100%) of the contract amount.

4.12.02 Failure by CONTRACTOR to perform the work in a timely or satisfactory fashion may result in forfeiture of CONTRACTOR's Performance Bond.

4.12.03 If the surety on any bond furnished by CONTRACTOR becomes a party to supervision, liquidation, rehabilitation action pursuant I.C. 27-9 et seq. or its right to do business in the State of Indiana is terminated, CONTRACTOR shall, within thirty days thereafter, substitute another bond and surety, both of which must be acceptable to CITY.

4.13 Payment of Subcontractors CONTRACTOR shall pay all subcontractors, laborers, material suppliers and those performing services to CONTRACTOR on the project under this Agreement. CITY may, as a condition precedent to any payment hereunder, require CONTRACTOR to submit satisfactory evidence of payments of any and all claims of subcontractors, laborers, material suppliers, and those furnishing services to CONTRACTOR. Upon receipt of a lawful claim, CITY shall withhold money due to CONTRACTOR in a sufficient amount too pay the subcontractors, laborer, material suppliers, and those furnishing services to CONTRACTOR.

4.14 Written Notice Written notice shall be considered as served when delivered in person or sent by mail to the individual, firm, or corporation, or to the last business address of such known to CONTRACTOR who serves the Notice. Notice shall be sent as follows:

TO CITY:	**TO CONTRACTOR:**
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Showers City Hall ----------
Post Office Box 848 ----------
Bloomington, Indiana 47402 ----------

4.15 **Severability and Waiver** In the event that any clause or provision of this Agreement is held to be invalid by any court of competent jurisdiction, the invalidity of such clause or provision shall not affect any other provision of this Agreement. Failure of either party to insist on strict compliance with the provision of this Agreement shall not constitute wavier of that party's right to demand later compliance with the same or other provisions of this Agreement.

4.16 **Notice to Proceed** CONTRACTOR shall not begin the work pursuant to the "Scope of Work" of this Agreement until it receives an official written Notice to Proceed from the City. Contractor shall start active and continuous work on the contract within 15 calendar days after the date of the Notice to Proceed. In no case shall work being prior to the date of the Notice to Proceed. If a delayed starting date is indicated in the proposal, the 15 calendar day limitation will be waived. Work day charges will then begin on a date mutually agreed upon, but not later than the delayed starting date specified. In the event that any contract is canceled after an award has been made but prior to the issuing of the Notice to Proceed, no reimbursement will be made for any expenses accrued relative to this contract during that period.

4.17 **Steel Product**

4.17.01 To comply with Indiana Code 5-16-8, affecting all contracts for the construction, reconstruction, alteration, repair, improvement or maintenance of public works, the following provision shall be added: If steel products are to be utilized or supplied in the performance of any contract or subcontractor, only domestic steel products shall be used. Should CITY feel that the cost of domestic steel is unreasonable, CITY will notify CONTRACTOR in writing of this fact.

4.17.02 Domestic Steel products are defined as follows:

"Products rolled, formed, shaped, drawn extruded, forged, cast, fabricated or otherwise similarly processed, or processed by a combination of two (2) or more of such operations, from steel made in the United States by open hearth, basic oxygen, electric furnace, bessemer or other steel making process."

4.17.03 The United States is defined to include all territory subject to the jurisdiction of the United States.

4.17.04 CITY may not authorize or make any payment to CONTRACTOR unless CITY is satisfied that CONTRACTOR has fully complied with this provision.

This Agreement may be modified only by a written amendment signed by both parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed the day and year first written above.

Department of Parks and Recreation

BY:

Mick Renneisen, Director

Date:

CONTRACTOR (Firm & Address)

BY:

Name Date

Name Printed:

Title:

Date:

CITY OF BLOOMINGTON

BY:

Mark Kruzan, Mayor

CITY OF BLOOMINGTON
Legal Department
Reviewed By:
_____
DATE: _____

PURDUE
ENGINEERING

LTAP
LOCAL TECHNICAL ASSISTANCE PROGRAM

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