



Charlotte **BIKES** Bicycle Plan



Adopted by Charlotte City Council
May 22, 2017

City of Charlotte
Department of Transportation



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The City of Charlotte would like to thank Michael Hernandez of Hernandez Photography for providing many of the photos used in this document.

Executive Summary

Charlotte will offer an inclusive cycling environment, where people of all ages and abilities can use their bikes for transportation, fitness, and fun. The City will work to extend bicycle infrastructure, educational opportunities, and promotional events to all neighborhoods and households, striving for equitable and affordable mobility options that improve city-wide public health, support the local economy, and reduce automobile dependency in the Queen City.

- Charlotte BIKES Vision Statement

Introduction

Bicyclists are an indicator of the health of a city. When a city's streets are safe and comfortable enough to travel by bicycle, and bicycling is considered a normal, routine choice for getting around, that city will earn the benefits of a healthier and happier population.

Charlotte BIKES is the city's blueprint to achieve the vision statement on the previous page. This plan provides the vision, goals, strategies and initiatives to expand the city's network of safe and comfortable bicycle facilities, and develop a culture which recognizes and welcomes the bicycle as a means of transportation for bicyclists of all ages and abilities.

Charlotte's Made Progress

In the past fifteen years, Charlotte has taken significant steps towards becoming a bicycle-friendly city. During this time, the City adopted a comprehensive bicycle plan, hired its first full-time staff member dedicated to bicycling, and formed a city/county bicycle advisory committee. A bellwether period was the adoption of the Transportation Action Plan and Urban Street Design Guidelines in 2006 and 2007 respectively, which set the expectation that the city would include bicycle facilities along thoroughfares wherever feasible.

These changes in city policy created a mindset change in the way Charlotte plans for bicyclists, from an extra mode to be considered if possible to an essential transportation choice for the residents of our growing city. Changes in city policy led to changes on the ground for bicyclists. From one mile of bicycle lanes in 2001, Charlotte's bicycle network has grown to include over 90 miles of bicycle lanes, 55 miles of signed routes and 40 miles of greenways and off-street paths.



Charlotte's progress towards becoming a bicycle-friendly city was recognized by the League of American Bicyclists with a bronze-level Bicycle Friendly Community award in 2008, 2012, and 2016.

BICYCLING MILESTONES

- 1974 First Bicycle Plan
- 1999 Second Bicycle Plan
- 2000 First *Bike! Charlotte* events
- 2001 First Mayor's Bike Ride
- Formation of City/County Bicycle Advisory Committee
- First mile of bicycle lanes striped
- 2002 First signed bicycle route
- 2008 First *Bicycle Friendly Community (Bronze)* designation
- Third Bicycle Plan
- 2011 First bicycle-specific signal detector
- 2012 First green bicycle pavement markings
- Charlotte B-Cycle launches
- 2013 First buffered bicycle lane
- 2017 First protected bicycle lane

But We Have A Lot More Work To Do

After ignoring bicycles in the transportation planning process for nearly a century, a city does not become bicycle-friendly overnight. To continue Charlotte's progress towards becoming an increasingly bicycle-friendly community and achieving the Charlotte BIKES vision, this plan addresses bicycling on six different fronts:



EQUITABLY implementing bicycle efforts throughout Charlotte,



ENGINEERING safe and comfortable bicycle facilities,



EDUCATING bicyclists and motorists to ride and drive safely,



ENCOURAGING a bicycle-friendly culture through facilities and events,



ENFORCING traffic laws to foster safety and accountability, and



EVALUATING and planning for an expanded bicycle network and expanded use.

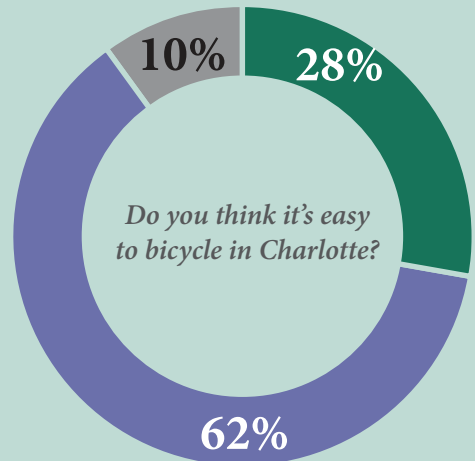
Some of the key recommendations identified in Charlotte BIKES include:

Creating a bicycle network and bicycle-related programming that benefits people of all ages, abilities, and neighborhoods in Charlotte.

The bicycle can be a tool to address inequities in Charlotte by providing an affordable, convenient transportation option. The City will ensure that bicycle-related planning, projects, and programs are designed to be beneficial for all residents and areas of the city.

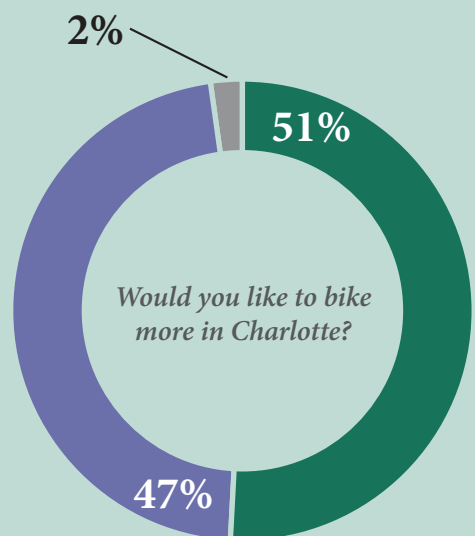
2016 CHARLOTTE TRANSPORTATION SURVEY

62% of Charlotte residents do not think it is easy to bicycle in Charlotte



● YES ● NO ● DON'T KNOW

51% of Charlotte residents would like to bicycle more than they currently do



● YES ● NO ● DON'T KNOW



Incorporating the latest in bikeway design guidance

Emerging national guidance and community feedback reveal that standard, “unprotected” bicycle lanes are not perceived as safe enough to encourage people of all ages and abilities to bicycle on Charlotte’s busy streets. The city will implement safe and comfortable bikeways, incorporating the latest national guidance on bikeway facility design in a context-sensitive approach.



Funding a Bicycle Program that addresses all aspects of creating a bicycle-friendly city

While Charlotte’s Community Investment Plan (CIP) typically focuses on the infrastructure to help people drive, walk and bicycle through the city, Charlotte BIKES recommends investments to advance all six of the “E’s” of creating a bicycle-friendly city, from constructing protected bicycle lanes and off-street paths, to sponsoring bicycling education courses, city-wide bicycle events and dedicated bicycle/pedestrian counting equipment.

Charlotte has made significant strides since the adoption and funding of the first bicycle program nearly sixteen years ago. However, there are four more levels of bicycle friendly community designations above bronze, and Charlotte will target a silver-level designation by 2020.



Charlotte BIKES lays out the goals, strategies and initiatives needed to continue to progress towards becoming an increasingly bicycle-friendly community that enables all members of our community to get outside and on a bike.

\$4 million *per year*



World-class bicycle projects, programs, and a bicycle-friendly community



BACKGROUND



What is Charlotte BIKES?

Charlotte BIKES is the city's blueprint toward becoming an increasingly bicycle-friendly city. This plan provides the vision, goals, strategies and initiatives to both expand the city's physical network of bicycle facilities and create a culture which recognizes and welcomes the bicycle as a means of transportation for cyclists of all ages and abilities.

Charlotte BIKES is organized around the 6 "E's" of creating a bicycle-friendly city.



EQUITABLY implementing bicycle efforts throughout Charlotte,



ENGINEERING safe and comfortable bicycle facilities,



EDUCATING bicyclists and motorists to ride and drive safely,



ENCOURAGING a bicycle-friendly culture through facilities and events,



ENFORCING traffic laws to foster safety and accountability, and



EVALUATING and planning for an expanded bicycle network and expanded use.

The final chapter of this plan is a recommended funding plan and set of initiatives to guide and implement the city's bicycle program.

Relationship to Other Plans

2008 Bicycle Plan

The City of Charlotte produced previous bicycle plans in 1974, 1999 and 2008. This Charlotte BIKES plan is considered an update to the Charlotte Bicycle Plan, which has served as a useful guiding document for citywide bicycle policy since its adoption in 2008. The 2008 Charlotte Bicycle Plan was an extensive effort, detailing policy recommendations and long-term bicycle facility recommendations. Many of the policy recommendations are still relevant, and the policies and recommendations of this 2016 Charlotte BIKES plan are intended to refresh and re-affirm past policies and to introduce new ones. The 2008 plan will continue to be referenced for background information concerning the development of policy. However, this update prevails in the event of any conflicts between the two documents.



Transportation Action Plan

The Transportation Action Plan (TAP) Update provides a framework to keep Charlotte's people and goods moving while accommodating an estimated 43 new residents per day over the next 25 years. Since the TAP's first adoption in 2006, increased funding for transportation of over \$530 million has been used to advance key road and intersection projects.

The key components in the TAP, as it relates to bicycling, are Objective

TAP Objective 2.6

The City will complete an additional 50 miles of bikeway facilities within the city by 2020, and an additional 200 miles by 2040.

2.6 (construction of 10 miles of new bikeway per year) and relates policies, as well as the Proposed Expenditure Plan, detailing approximately \$5 billion in transportation investments over the next 25 years. **The TAP calls for funding the bicycle program at \$4 million per year.**

Many of the other recommended investments in the TAP would also benefit bicyclists through the routine provision of bicycle facilities as part of other capital projects.



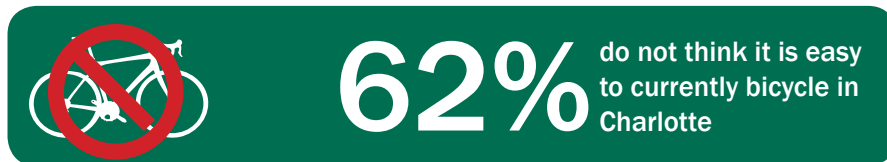
Why Charlotte BIKES?

It's What Our Residents Want

A bicycle-friendly Charlotte is what many Charlotte residents have been asking for.

Public Surveys

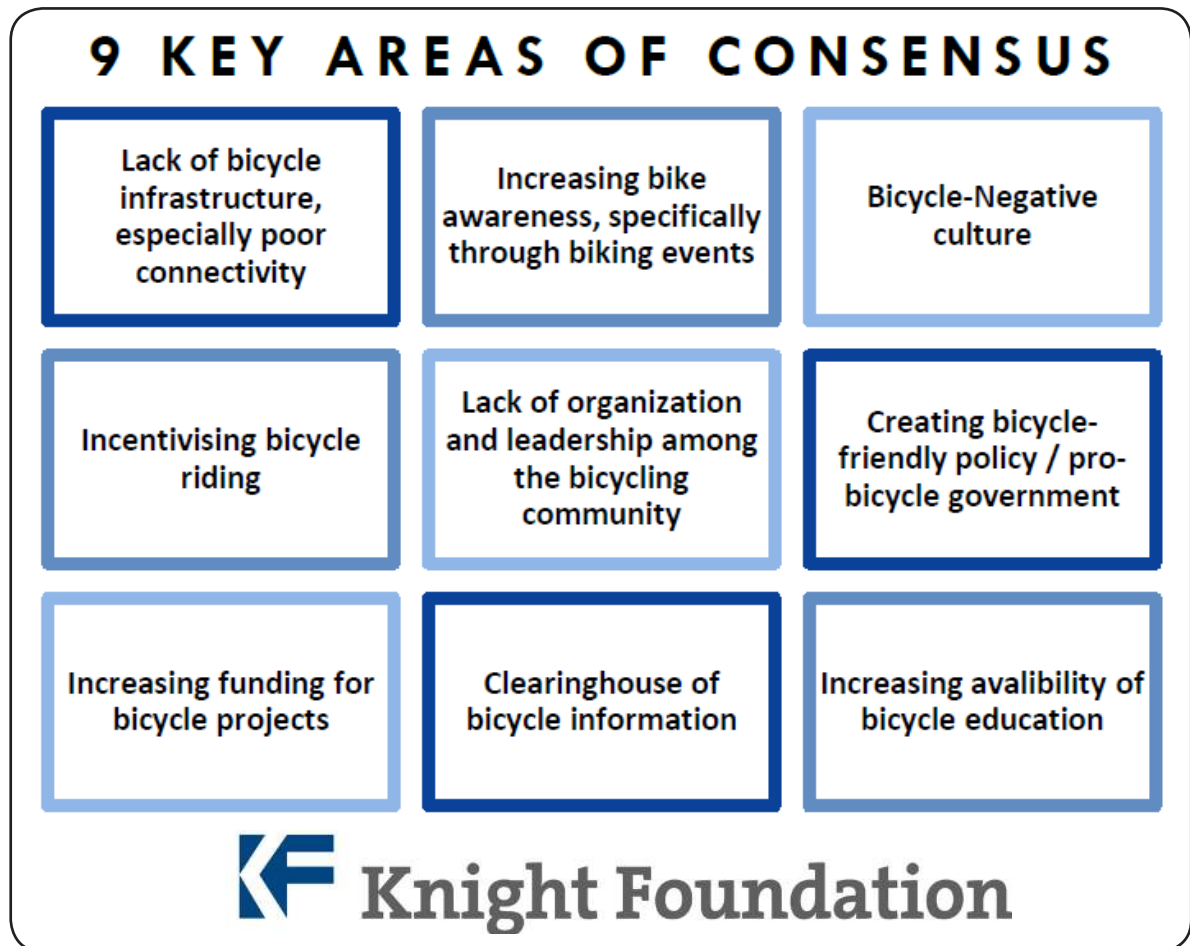
Bicycling has become an increasingly popular choice and desire among our residents, and there exists a large percentage of Charlotteans who currently don't bicycle, but would like to do so. In a statistically-valid 2016 transportation survey conducted by Charlotte DOT, the results indicated:



Community Dialogues

In addition, the Charlotte community has a history of coming forward and advocating for a more bicycle-friendly city. Thanks to the dedicated efforts of non-profits and individuals, there have been numerous community efforts to both advocate for better bicycling conditions and encourage more and safer bicycling through events.

One of the latest such efforts, in the fall of 2014, was a “Charlotte Cycles Community Dialogue”, launched by the John S. and James L. Knight Foundation. The conversation convened cycling advocates, nonprofit leaders, bicyclists, government officials, and other community members to discuss how to make Charlotte the next great bicycle-friendly city. Through this dialogue, the facilitators arrived at nine key areas of consensus, shown below:

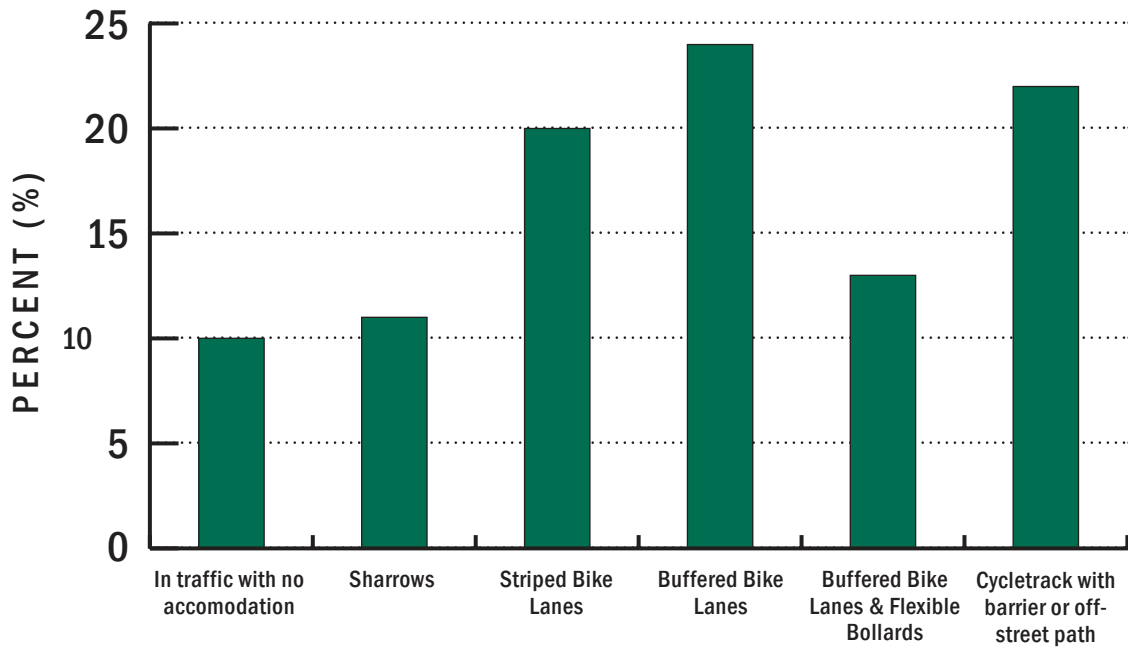


This Charlotte Cycles Community Dialogue is just one example of the many ways in which residents and advocates have discussed a desire to create a bicycle-friendly city. Public engagement related to city initiatives such as the Cross Charlotte Trail and Uptown Connects study have also received substantial feedback from bicyclists and the bike-curious, almost always focused on pushing the City to become as bike-friendly as possible, as quickly as possible.

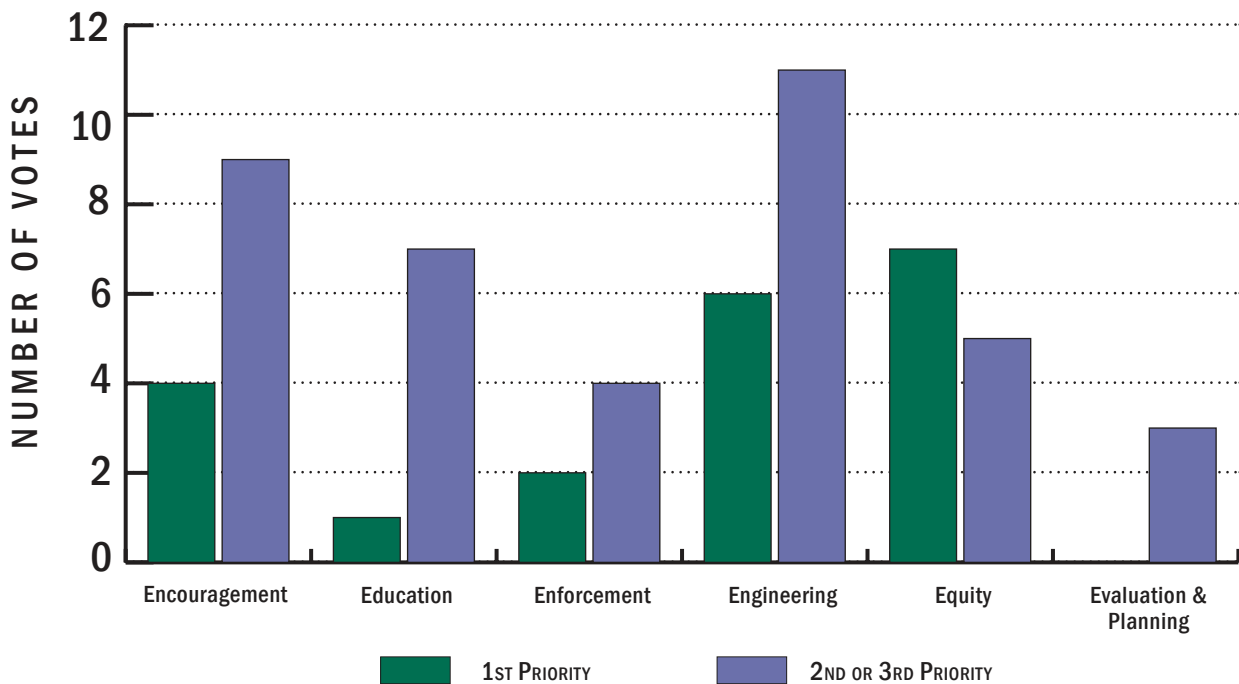
Public Input for Charlotte Bikes

Staff also gathered specific public input to guide the development of Charlotte BIKES. Staff asked three key questions of residents at public workshops and pop-up events:

“What type of bicycle facility would make you comfortable riding a bicycle on a busy street in Charlotte?”



“Which of the 6 “E’s” of a bicycle-friendly city is important and deserving of the most attention?”



It's Part of the Solution to Keep Charlotte Moving

A bicycle-friendly Charlotte will give residents another option to move around in our rapidly growing city.

Charlotte is one of the fastest-growing cities in the country. The city's population is projected to increase by nearly 50% over the next 25 years from 800,000 to almost 1,200,000. This gain of approximately 400,000 residents alone is roughly equivalent to the current populations of some of the nation's largest cities, such as Minneapolis (407,000), Cleveland (389,000) or, in a North Carolina context, Raleigh (440,000).

The transportation needs of Charlotte's current and future population cannot be met by motor vehicles alone as the growth outpaces the ability to develop serviceable street networks. Charlotte made a commitment to providing transportation choices with the adoption of the Transportation Action Plan in 2006. The bicycle is one of those essential choices. As Charlotte grows and becomes increasingly dense, the bicycle will become an increasingly competitive transportation choice due to its low cost and ease of parking compared to a motor vehicle. It's estimated that nearly 50 percent of all trips in the US are 3 miles or less... less than a 20 minute bike ride (USDOT Summary of Travel Trends: 2009 National Household Travel Survey).

Bicycling also complements the City's investment in transit by providing first- and last-mile travel to and from transit. Each CATS bus has a bicycle rack, and bicyclists can either lock their bike up at light rail stations, or roll them right on the train.



All CATS buses are equipped with bicycle racks.



Charlotte B-Cycle gives residents and visitors the opportunity to ride bicycles.

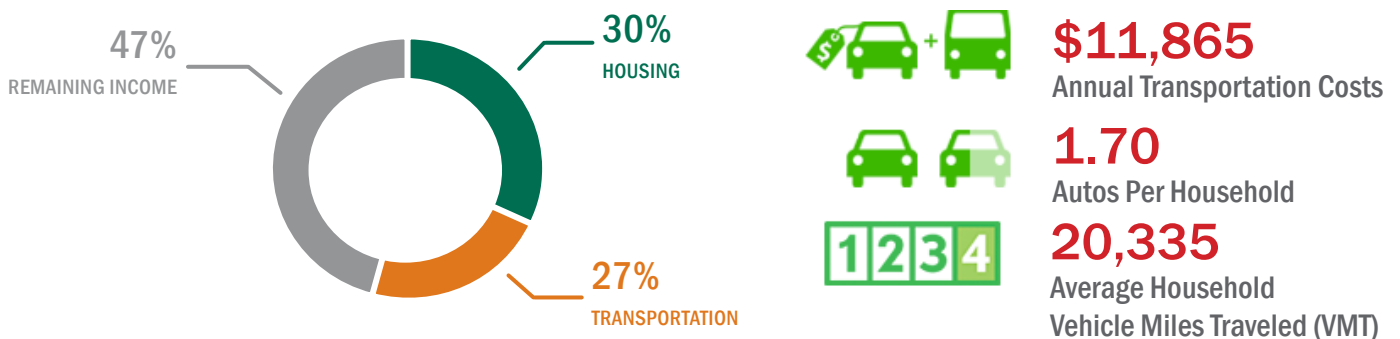
It's Good For Our Residents

A bicycle-friendly Charlotte will encourage residents to take those bicycles out of the garage and get the wheels rolling.

Affordable

A reliable, functional bicycle and all of the relevant equipment such as a rack, fenders, lights and a lock can be acquired inexpensively from one of the numerous bicycle shops in Charlotte. After purchase, a bicycle can afford residents access to their daily needs for the annual cost of less than \$100. In contrast, the AAA estimates the annual cost of automobile ownership at \$8,698 (*Your Driving Costs*, AAA, 2015). Due to the large expense of owning and maintaining an automobile, transportation accounts for the second-largest expense for the average US household budget (Bureau of Labor Statistics, 2014).

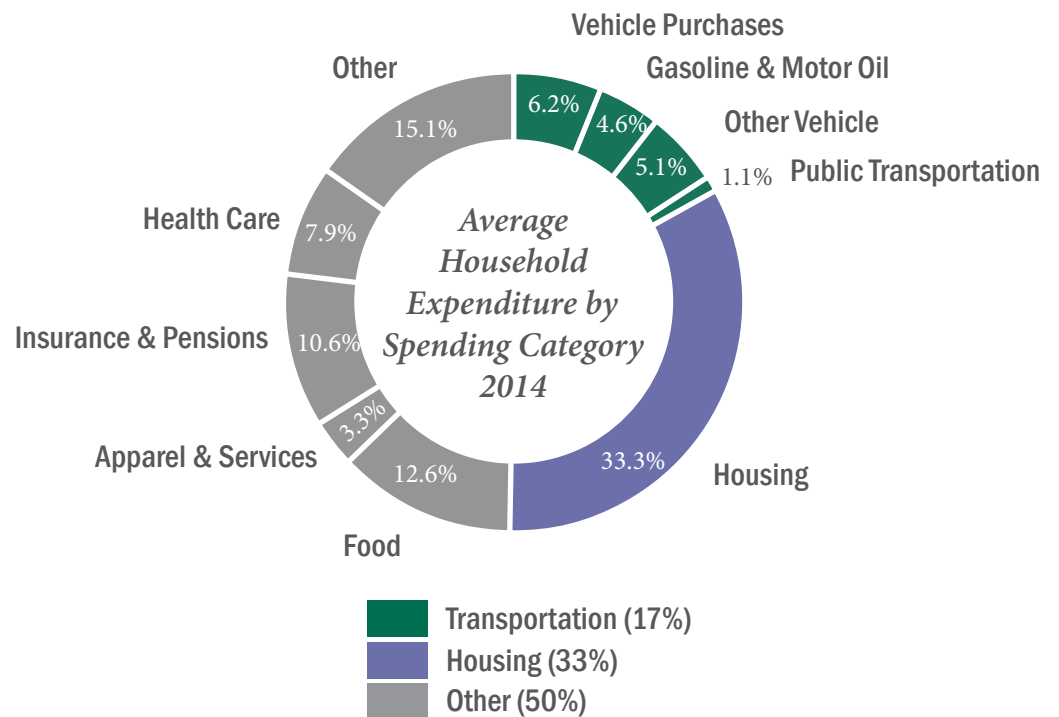
The Center for Neighborhood Technology provides the following transportation and housing expense estimates for the typical household in Charlotte:



At a time when housing affordability has become a hot topic in Charlotte, investments in bicycling present an opportunity to partially mitigate the rising costs of housing by offering a less expensive transportation option.

A bicycle-friendly Charlotte can literally save residents thousands of dollars in transportation costs. This money could be better spent on housing, education, or supporting the local economy in more productive ways than at the gas pump.

Average Household Expenditures by Spending Category: 2014



Source: US Census 2010

Available

According to CDOT's 2016 *Transportation Survey*, it is estimated that 65 percent of Charlotte households have access to at least one bicycle. For those that don't, Charlotte B-Cycle provides an opportunity for residents to bicycle without the need for bicycle ownership since its launch in 2012. In 2015, B-Cycle sold 15,700 24-hour memberships and 700 annual memberships, indicating that residents and visitors are taking advantage of this service.

One factor often overlooked in transportation planning is that roughly thirty percent of the population is unable to drive a motor vehicle. This cohort includes those who are too young to obtain a driver's license, those of advanced age for whom independent driving is no longer an option, those with disabilities which interfere with being able to drive, or those who either choose not to drive or cannot afford to drive.

Healthy

Bicycling is a low impact and cost-effective way to achieve the 150 minutes of weekly, moderate aerobic activity recommended by the Department of Health and Human Services. Once the initial investment in a bicycle is made, a person can build the exercise into their daily errand or commute trips for free, which beats paying for a gym membership and spending time and money driving to a gym.

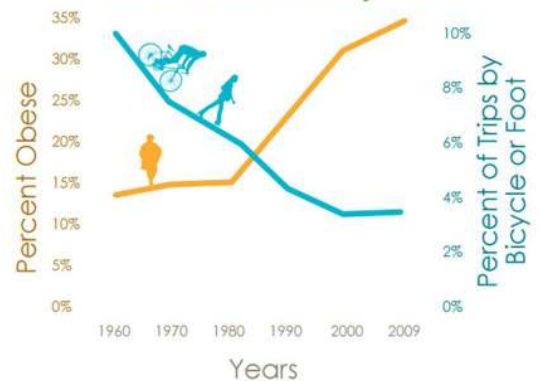
Blue Cross Blue Shield of North Carolina (BCBSNC), a company with a business incentive to encourage healthy communities, embraced bicycling in Charlotte with over \$2 million in sponsorship to launch Charlotte's bike share system, Charlotte B-Cycle. BCBSNC funded the system through its "Get Outside North Carolina" campaign, a four-year state-wide initiative that encourages active lifestyles. The Charlotte B-Cycle system has since provided over 200,000 trips since the 20-station, 200-bike system launched in 2012.

"There's no machine known that is more efficient than a human on a bicycle... bowl of oatmeal, 30 miles – you can't come close to that."

– Bill Nye



Change in Walking and Bicycling Rates vs. Adult Obesity Rates



Source: BikewalkNC

2 fifteen min. bike rides **x** **5** days per week = **A healthier Charlottean!**



It's Good For Our Economy

A bicycle-friendly Charlotte will help attract residents, businesses and jobs.

A vibrant city needs to attract new businesses which bring economic opportunity, and new residents, who demand employment, housing, services and goods. In recent years, bicycle-friendliness has become one of the indicators of a desirable city.

For example, real estate listings highlight measurements such as *Walkscore* and *Bikescore*, and reference proximity to greenways. Charlotte developers are realizing the marketable benefits of bicycling for their tenants and customers.

In recent years, the private market has responded to the increased interest in bicycle-friendliness by:



Including *Walkscore* and *Bikescore* as part of real estate listings



Developing along bicycle-friendly corridors like greenways and the rail trail



Marketing properties adjacent to trails as an amenity



Installing custom bicycle parking racks in highly-visible locations



Funding the installation of new bike share stations as part of new developments



Providing bicycle repair stations for residents

It's Good For Our Neighborhoods

A bicycle-friendly Charlotte will make our neighborhoods better places to live.

A common complaint of neighborhood residents is their concern of motor vehicles “cutting through” their neighborhood, often speeding and using their residential streets as a way to avoid congestion on thoroughfares. In comparison, residents typically have no issues with bicyclists riding through their neighborhood as bicycles are quiet, do not speed and do not represent a danger to children or pets.

“My one rule in moving to a new city is simple: Live within walking or biking distance to a great cup of coffee and a cold brew. That rule has never steered me wrong in finding great communities and fun, useful resources within a walk or bike ride from my home. I understand that living near the places that matter most to you is important when looking for a home. “

- Casse Cunningham, local realtor

In fact, some neighborhoods in Charlotte have advocated to get more residents traveling by bicycle. The Plaza-Midwood Neighborhood Association sponsored an “Alternative Transportation Challenge”, which encouraged residents to run, walk or ride a bike during a “car-free week” and celebrate the neighborhood’s new community-designed-and-installed bike racks.

Other events, such as the Tour de Turns charity bicycle ride, show how it is possible to navigate Charlotte’s neighborhoods by bicycle. The Tour de Turns route ties together 25 distinct Charlotte neighborhoods on mostly local, bicycle-friendly streets. Likewise, the Biketoberfest event produced by Sustain Charlotte encourages participants to walk and bicycle to various destinations in the Uptown and South End neighborhoods through a scavenger hunt format. The Open Streets 704 events, funded by a grant from the Knight Foundation, encouraged thousands of residents to enjoy their neighborhoods, interact with each other, and discover local businesses and vendors on routes closed to cars on two Sunday afternoons in 2016.



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Charlotte’s Progress Towards Becoming Bicycle-Friendly

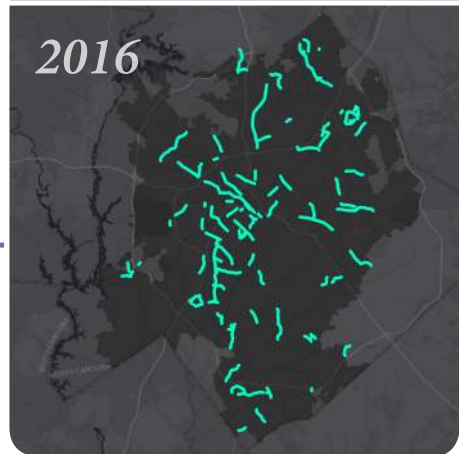
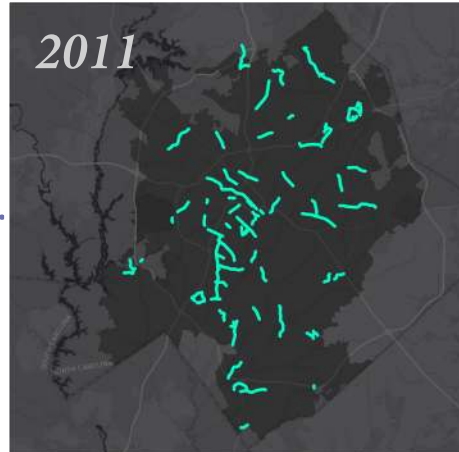
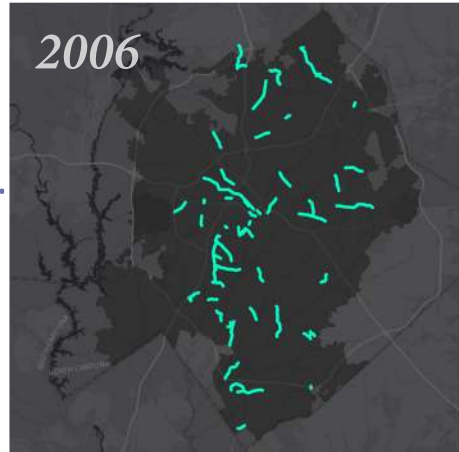
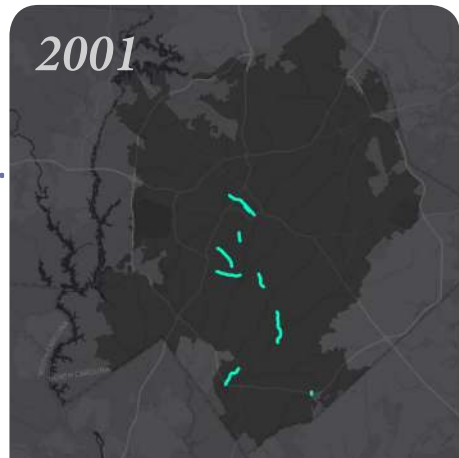
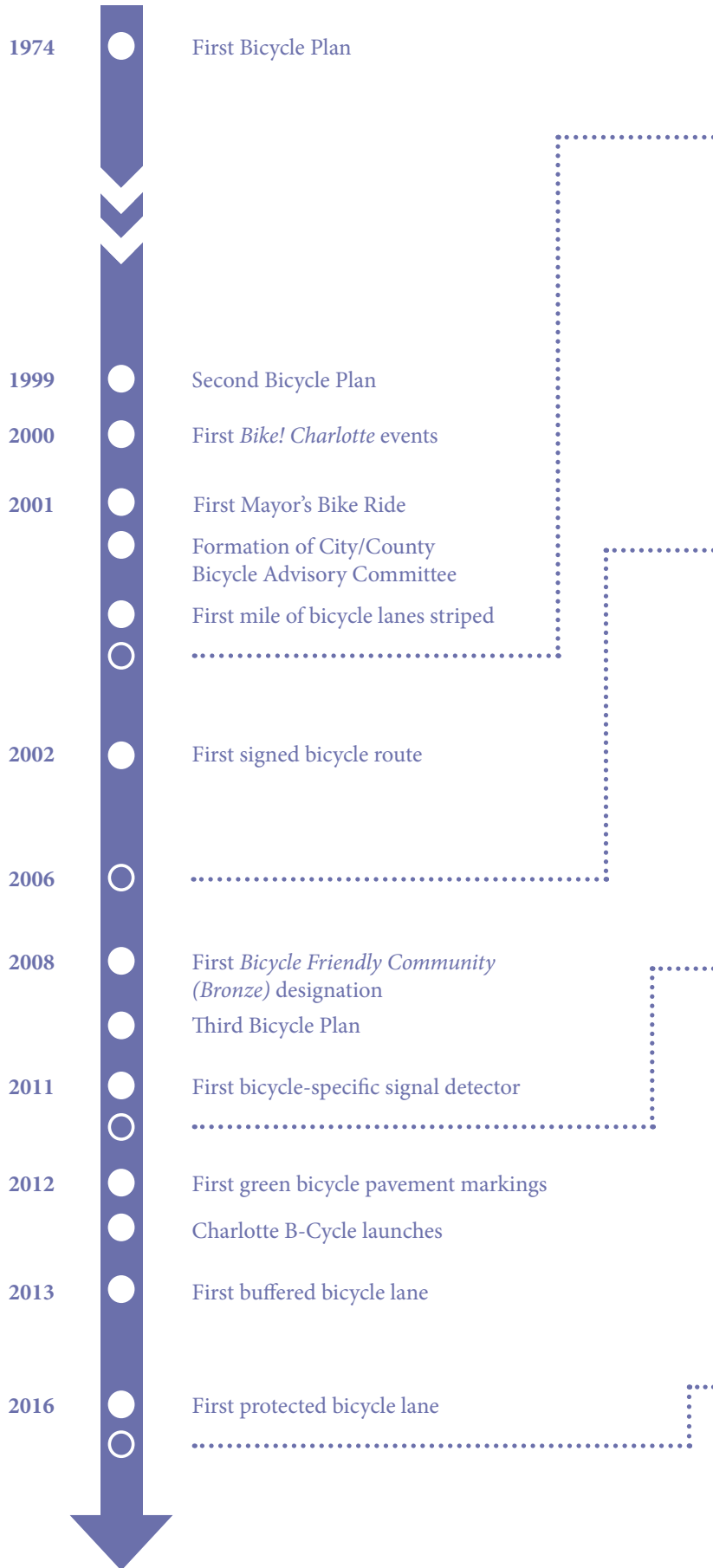
Bicycle Network Growth

1999 was a pivotal year for bicycle infrastructure in the City of Charlotte. With support and urging from the bicycling community, the city adopted its first bicycle plan and hired its first bicycle planner. Soon thereafter, bicycle facilities began emerging, with the first bicycle lane marked on Colony Road in 2001. In the early 2000’s, the city began including bicycle lanes on select projects, and formally embraced bicycle lanes as the preferred bicycle facility on Charlotte’s thoroughfares with the adoption of the Urban Street Design Guidelines (2007) and Charlotte Bicycle Plan (2008).

Over time, bicycle lanes developed as part of isolated projects have begun to tie together into a more connected network. In addition, the city has installed ten distinct signed routes, and the city and Mecklenburg County have been constructing off-street paths and greenways, respectively. This network has come to total over 190 miles of bicycle facilities in 2016, and the city continues to add to this network every year through capital projects and maintenance activities.

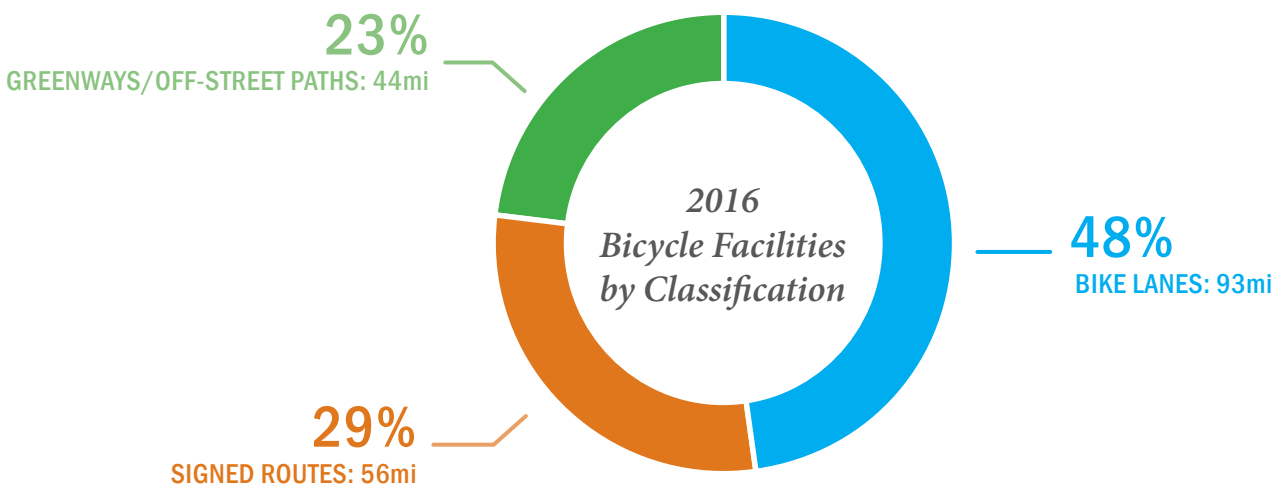
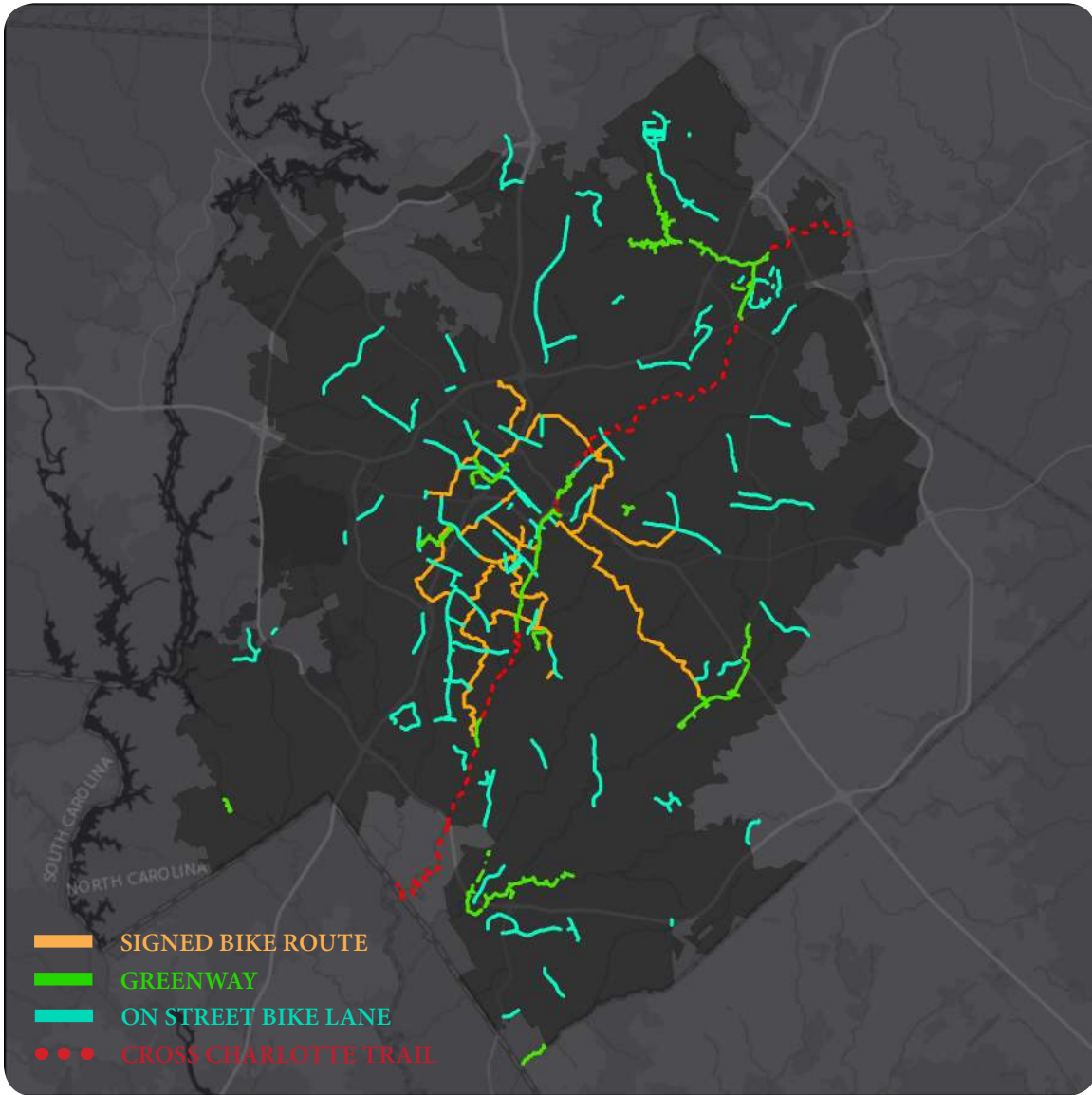


BICYCLING MILESTONES



////// BICYCLE NETWORK GROWTH 2001 – 2016

2016 Bicycle Facilities Map



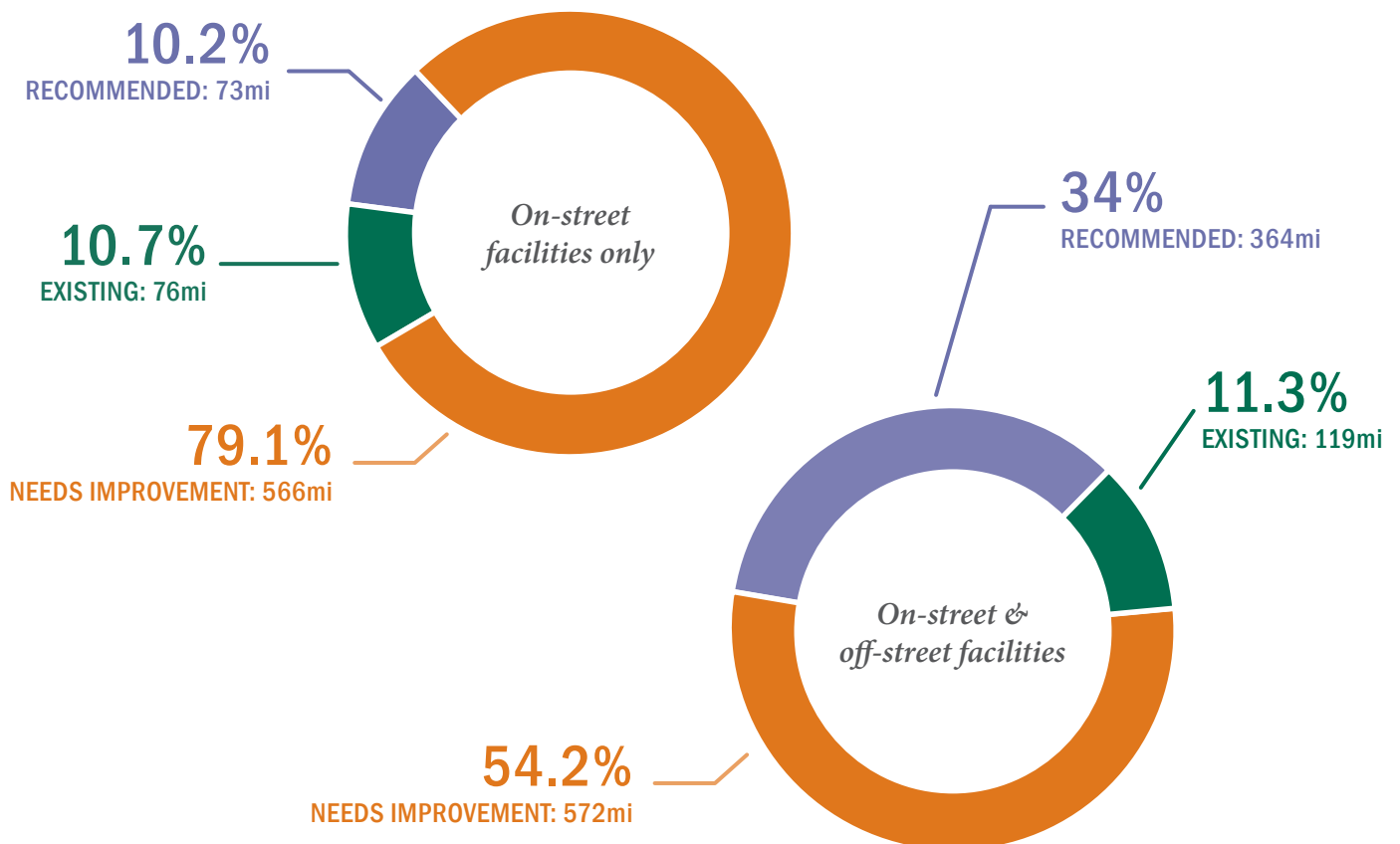
Comprehensive Transportation Plan

In 2015-2016, City staff conducted an assessment of street network conditions as part of the development of the Charlotte Regional Transportation Planning Organization's Comprehensive Transportation Plan (CTP). The CTP consists of four maps illustrating staff's assessment of travel networks for motorists, bicyclists, pedestrians, transit riders and freight. CRTPO staff worked closely with staff from NCDOT and local jurisdictions, including Charlotte, to prepare the CTP and ensure that it reflects adopted plans and policies.

This recent assessment of thoroughfare network conditions provides insight into the completeness of this network for bicyclists in Charlotte. The CTP classifies thoroughfare segments into one of three categories:

- **Existing** — The existing facility is not expected to change. The facility may be considered adequate based on a variety of factors such as appropriate design, expected future traffic volumes, consistency with adopted plans, or livability objectives. The facility may also be considered adequate based on its context within the larger transportation network or because it is unbuildable due to physical constraints.
- **Needs Improvement** — The existing facility or service is (or is expected to be) inadequate and should be changed to accommodate expected traffic volumes, improve inadequate design or identified safety issues, reflect pedestrian and bicycle facilities shown in adopted plans, improve poorly designed facilities, or fill in connectivity gaps.
- **Recommended** — There are no existing facilities or services and a new facility or service is needed.

CTP Bicycle Network Status

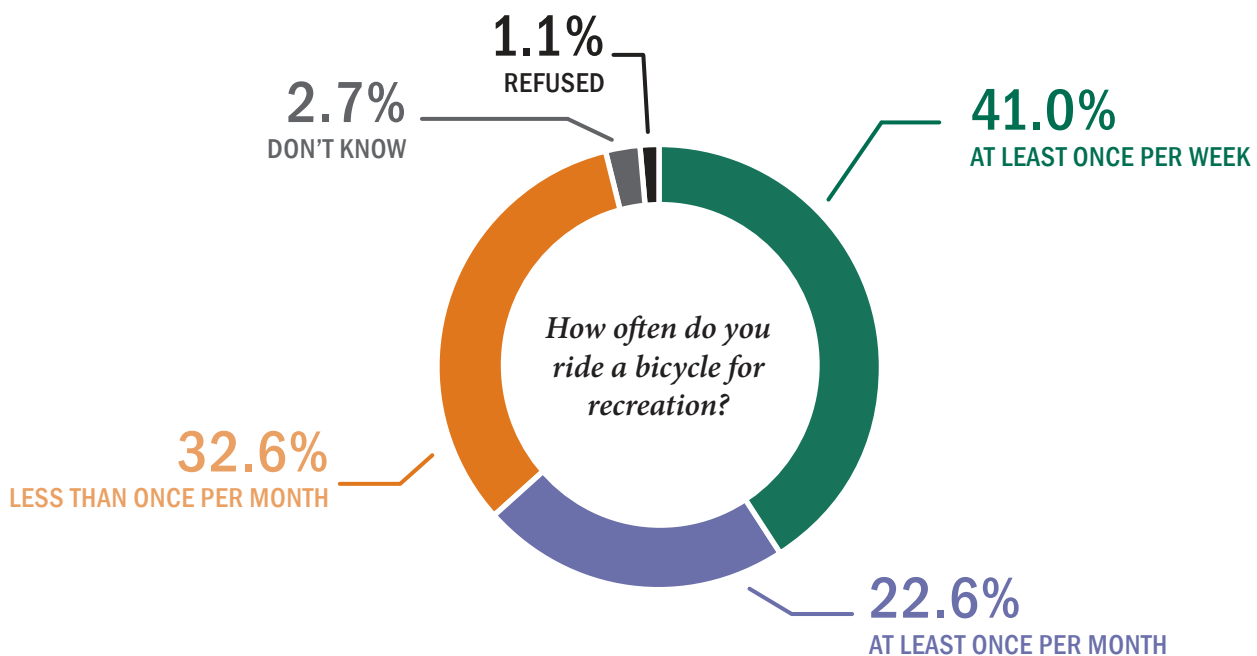
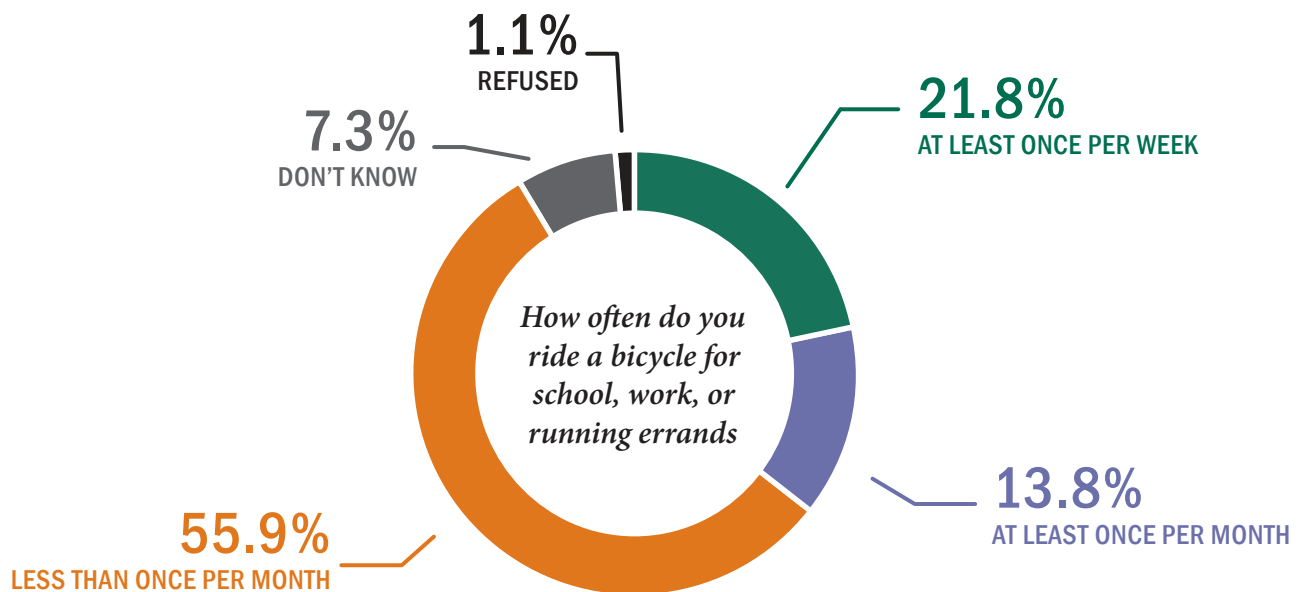


Ridership Trends

Until recently, no one counted bicycle use on the city's streets as is commonplace for motor vehicles. However, as part of a partnership with the North Carolina Department of Transportation and the Institute for Transportation Research and Education (ITRE), eighteen dedicated bicycle/pedestrian counters have recently been installed at ten locations on city streets and trails. In future years, these counters will provide an important trend-line for the city to measure its progress towards accommodating bicycle trips. In the meantime, the city has inferred or indirectly measured bicycling use in a few different ways which are highlighted below.

CDOT's Biennial Transportation Survey

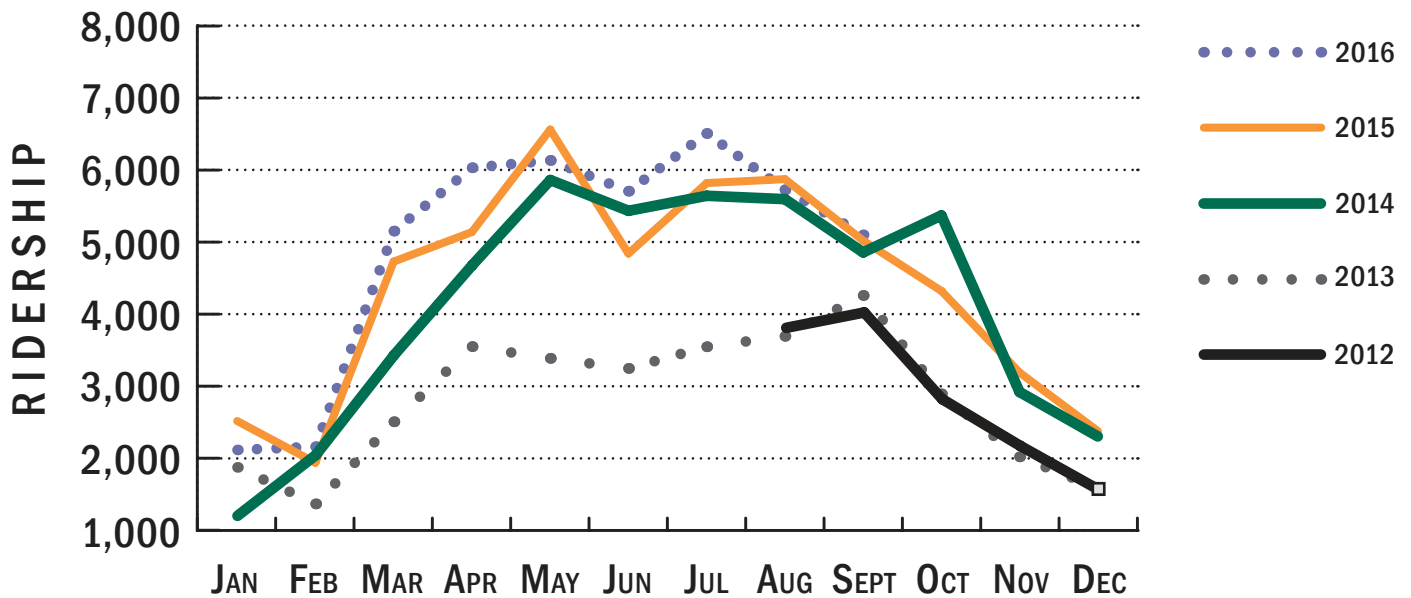
The City of Charlotte's 2016 Transportation Survey asked participants about their bike use. If they indicated that they did have access to a bicycle, the following two questions were asked:



B-Cycle Statistics

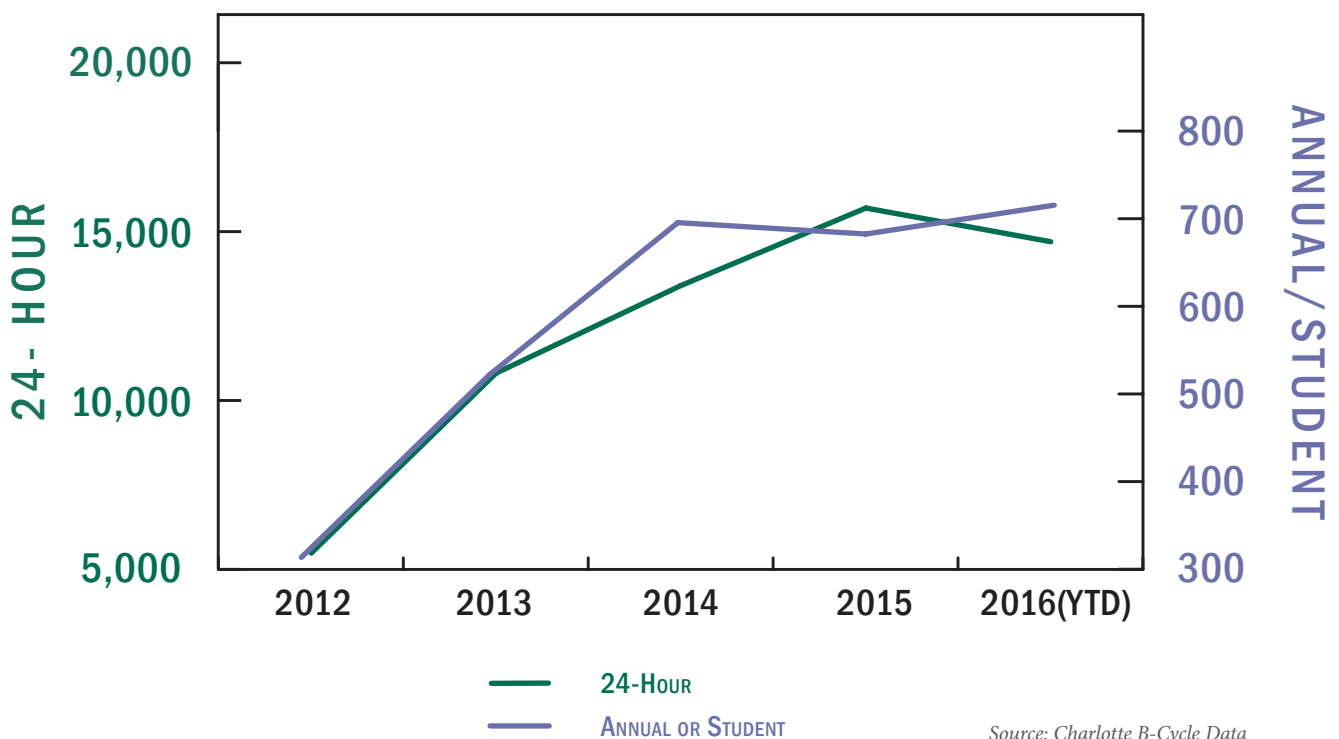
Charlotte B-Cycle was launched in 2012 by Charlotte Center City Partners with support from the City of Charlotte and funding from private sponsors. Since then, the system has expanded from 20 to 24 stations in and around Center City and has provided over 200,000 trips through its four years of operation. Charlotte B-Cycle has gathered data on ridership and membership trends since the launch of the system, including some of the statistics below:

Charlotte B-Cycle Ridership by Month Over Time



Source: Charlotte B-Cycle Data

Charlotte B-Cycle Membership by Year

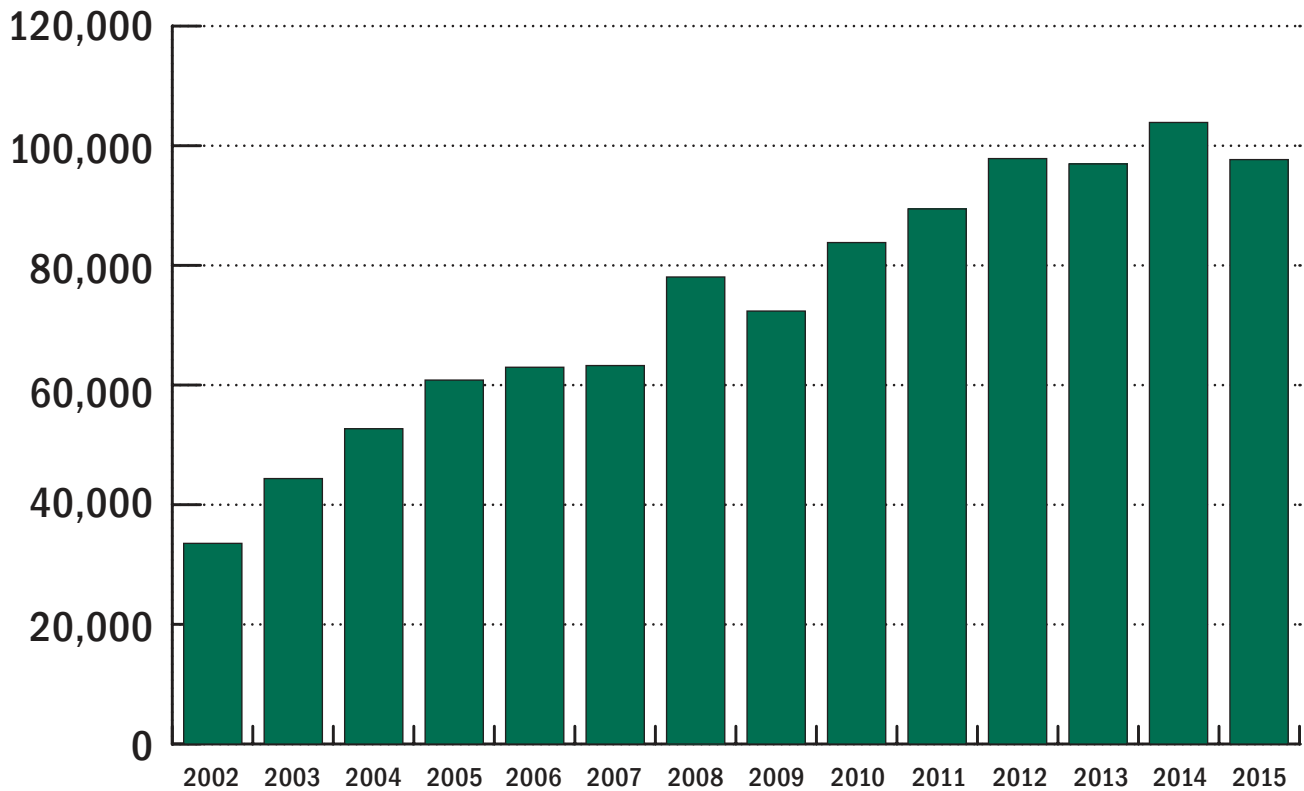


Source: Charlotte B-Cycle Data

CATS Bike-on-Bus Boardings

The Charlotte Area Transit System counts every bus rider who brings a bicycle with them for the ride. These “bike-on-bus” boardings represent the most consistent, if indirect, measure of bicycling use in Charlotte. Since the adoption of Charlotte’s 2008 Bicycle Plan, bike-on-bus boardings have increased 25 percent.

CATS Bike-on-Bus Boardings by Year

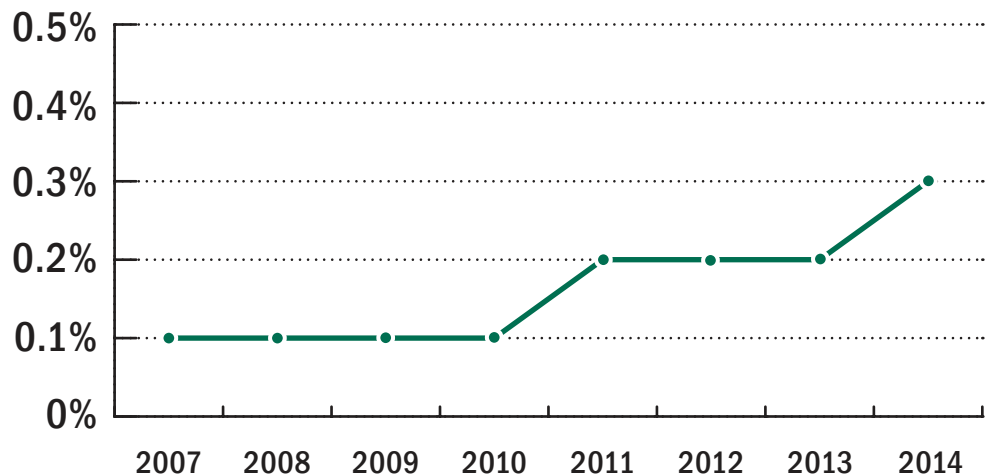


Source: CATS Ridership Data

American Community Survey Journey to Work Data

The US Census American Community Survey (ACS) represents the most commonly-used data source for comparing bicycling use across communities. This data source has some limitations, as it’s based on a sample of the population and it only asks about bicycle commuting, not bicycle ridership in general. Since the work commute trip only represents approximately 15 percent of all personal trips (2009 *National Household Transportation Survey*), the ACS mode share data likely undercounts the true mode share of bicycles for all trips. Even so, bicycle commuting increased 200 percent since the adoption of Charlotte’s 2008 Bicycle Plan.

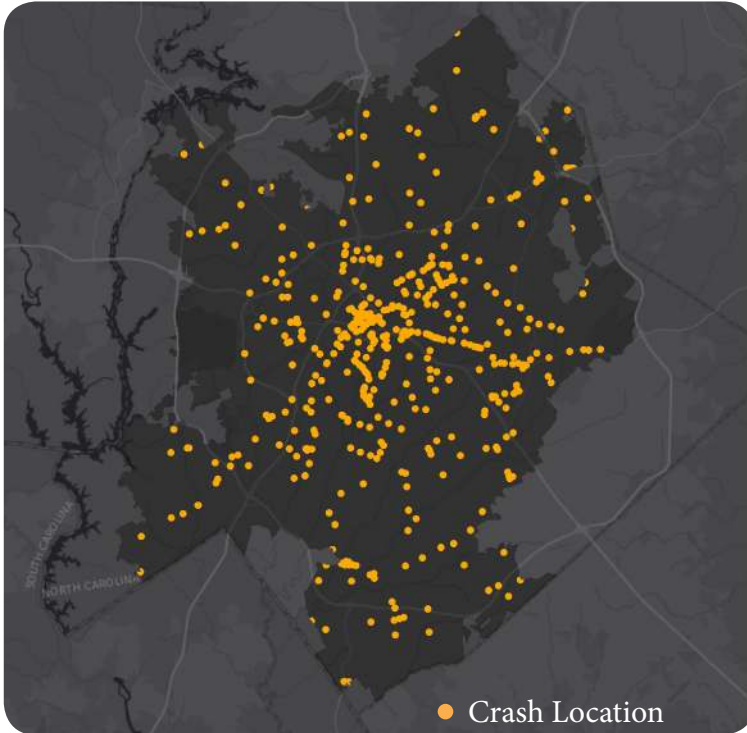
ACS Journey to Work Data (2007-2014)



Safety

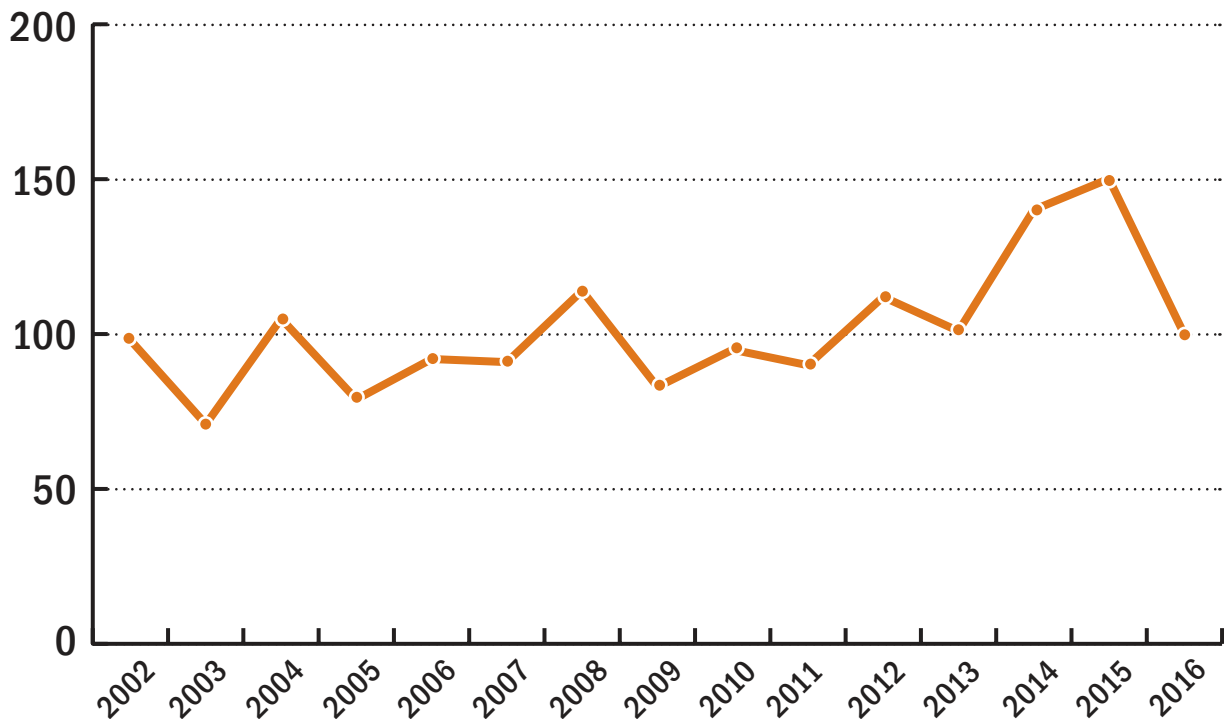
While Charlotte has made significant progress on expanding the bicycle network in Charlotte, bicycle crashes have also trended higher. Investing in bicycle infrastructure and programs will help address the safety of bicyclists.

Bicycle Crashes in Charlotte (2002-2015)



In 2016, there were 100 reported crashes involving bicyclists, a 20% increase since 2009. The recent rise in bicycle crashes has followed a general rising trend in crashes for all modes of travel.

Bicycle Crashes by Year in Charlotte (2002-2015)



Source: Charlotte-Mecklenburg Police Department

EQUITY

Bicycling for All





GOAL:

The City will create a safe, comfortable and convenient network of bicycle facilities that aid and encourage cycling for people of all ages, abilities and interests, in all areas of Charlotte.

Background

The bicycle is an affordable tool that should be useful and beneficial to a wide range of ages, abilities and neighborhoods in Charlotte. Yet, bicycling can sometimes have the perception of a privileged sport, embraced most frequently as a leisure activity for twenty-to forty-something white males. There is even an acronym to fit the stereotype – MAMIL, for “Middle-Aged-Man-In-Lycra.”

Nearly 100,000 bicyclists combined their bike trip with a Charlotte Area Transit bus ride in 2015

It’s true that Charlotte has had a strong recreational bicycling culture, with group rides full of lycra-clad road bicyclists departing from many locations in the Charlotte region. However, this stereotype doesn’t begin to capture the breadth of the existing and potential bicycling demographics of Charlotte. “Invisible cyclists” is a term meant to reflect the many bicyclists who are simply using a bike to get to work and school, yet aren’t typically represented in typical bicycling advocate organizations.

Likewise, we know many Charlotte residents of different ages and races, different neighborhoods, and different means have an interest in bicycling if they perceive it as safe, comfortable and convenient to do so. A study from Portland, Oregon conceptually divided the bicycling population into **four categories**, and is likely reflective of the population in Charlotte as well:



Charlotte’s challenge, as the CLT Bikes vision statement indicates, is to “offer an inclusive cycling environment, where people of all ages and abilities can use their bikes for transportation, fitness and fun.” If we’re successful, two-thirds of our residents will be comfortable using a bicycle for transportation in Charlotte.

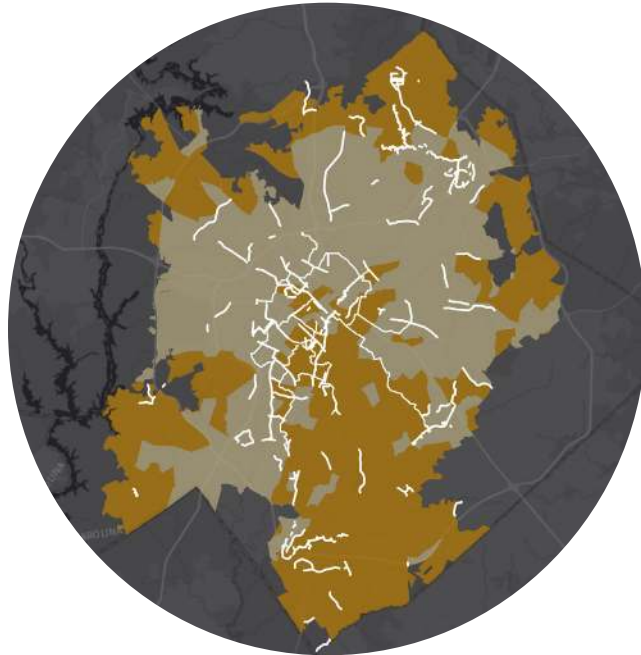




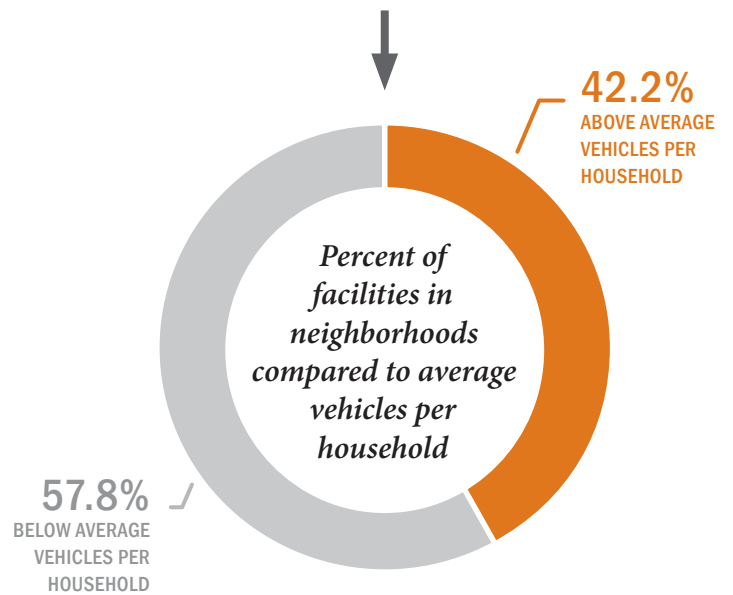
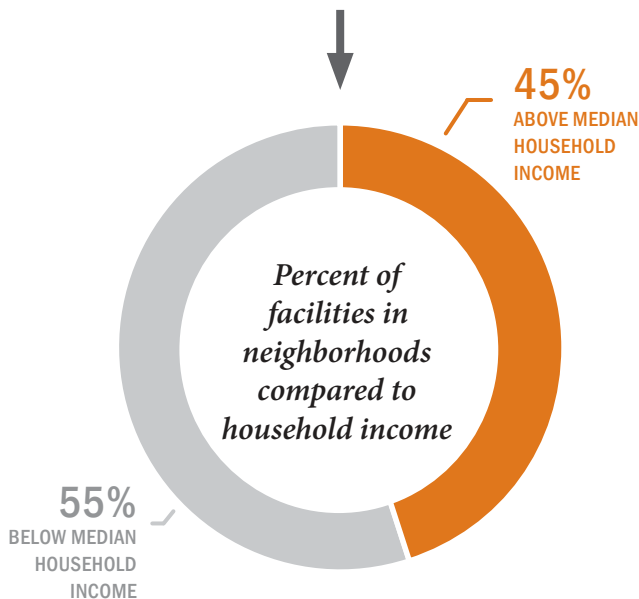
Equity in Engineering, Evaluation, and Planning

Due to the policy recommendations of the Transportation Action Plan and 2008 Charlotte Bicycle Plan, Charlotte strives to build bicycle facilities as part of all appropriate road projects and regular street maintenance, in all areas of the city. As a result of this policy, Charlotte's nearly 200 miles of bicycle facilities have been implemented across many different neighborhoods and areas of the city.

Bicycle Facilities & Household Income



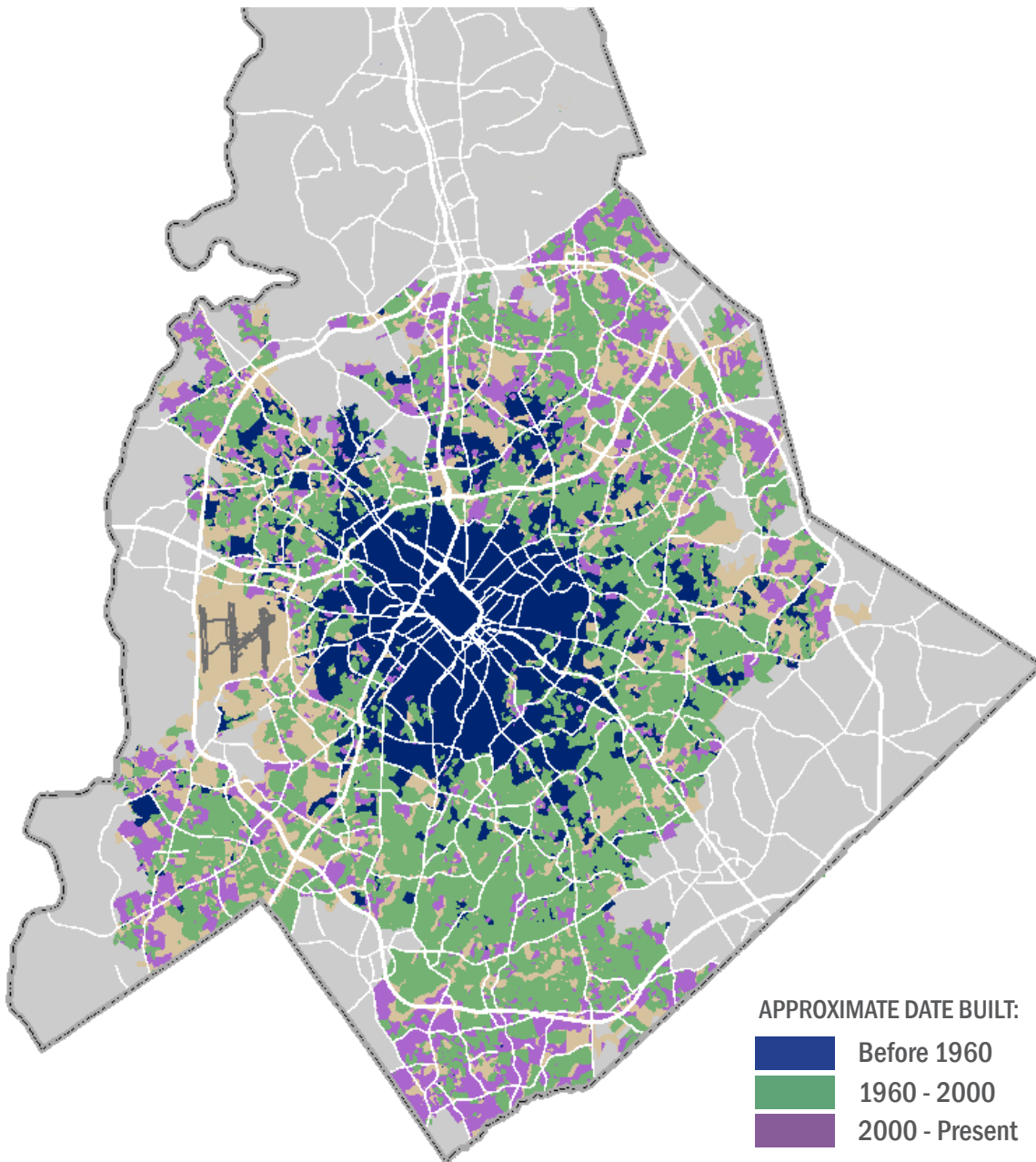
Bicycle Facilities & Vehicle Ownership



There is one aspect in which Charlotte has struggled to provide bicycle facilities equitably to all residents of Charlotte. In the areas of Charlotte developed generally between the 1960s and 2000, the transportation focus was almost entirely on accommodating motor vehicle traffic.

Consequently, the many Charlotte neighborhoods developed during this timeframe lack the local street connectivity that allows pedestrians and bicyclists to travel on low-volume, low-speed streets, while the thoroughfares built during this period were designed solely with motorists in mind, with little “extra” space or available road capacity to create bicycle facilities .

Land Developed 1960 - 2000



The areas of Charlotte shown in green were developed after 1960 and before 2000, and they often lack the local street connectivity that is so beneficial to cyclists.

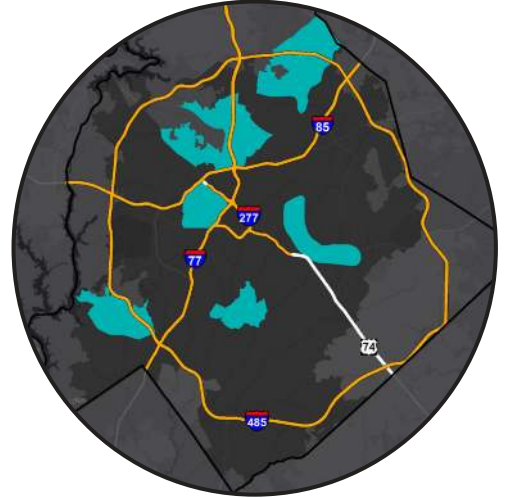
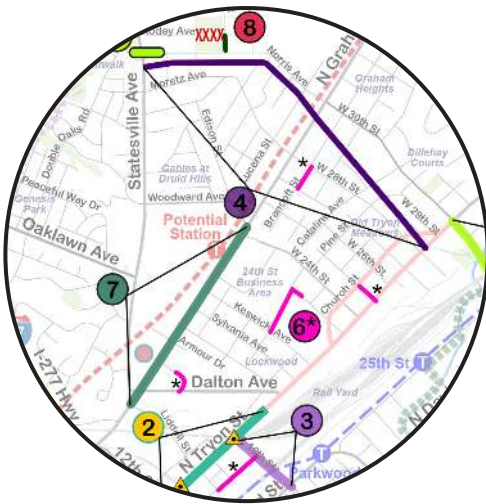




Retrofitting a network of bicycle facilities in these areas of Charlotte typically relies on significant street projects such as street upgrades and widenings. Fortunately, Charlotte City Council’s adopted 2016-2020 Community Investment Plan includes a number of projects that are expected to include bicycle facilities in a number of neighborhoods that currently have little or no bicycle facilities.

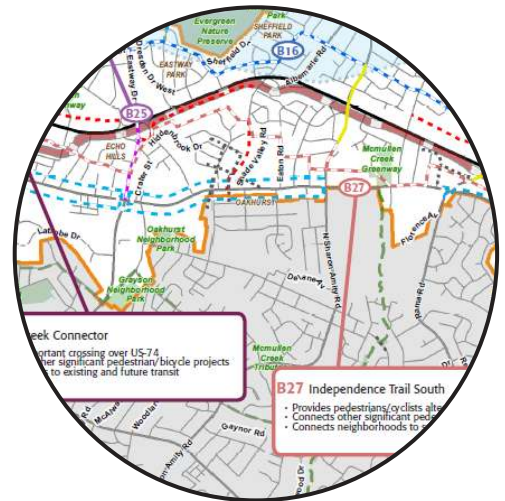
2016-2020 CITY PROJECTS AND PROGRAMS THAT INCLUDE BICYCLE FACILITIES:

SIX COMPREHENSIVE NEIGHBORHOOD IMPROVEMENT PROGRAM (CNIP) AREAS



APPLIED INNOVATION CORRIDOR (AIC) AND NORTHEAST CORRIDOR INFRASTRUCTURE PROGRAM (NECI)

INDEPENDENCE AREA SIDEWALK & BIKEWAY IMPROVEMENTS



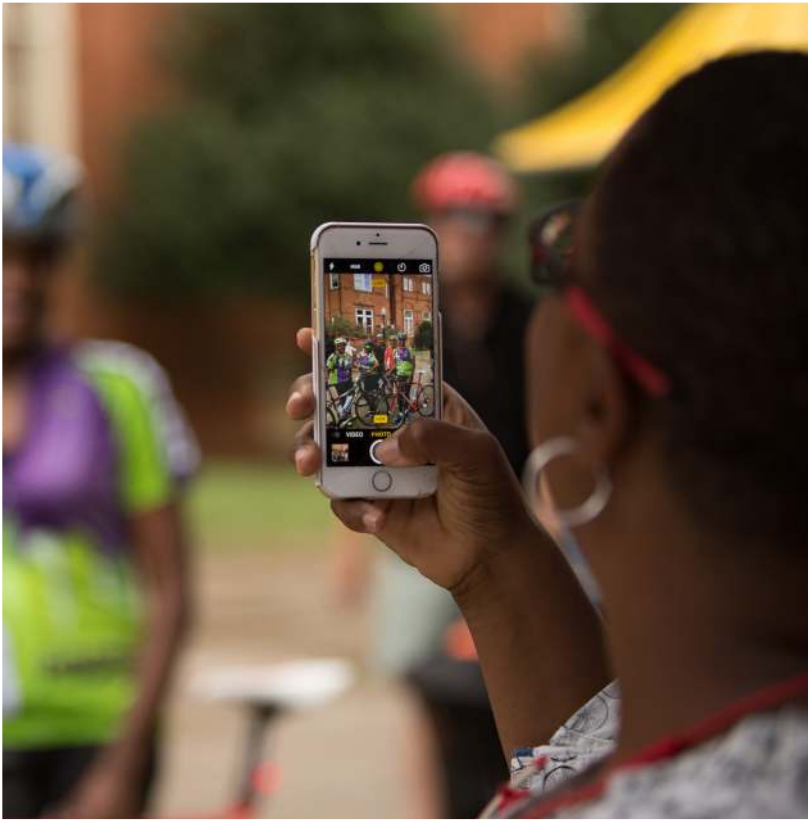
CROSS CHARLOTTE TRAIL

Equity in Education, Encouragement, and Enforcement

Charlotte is fortunate in that there are a number of bicycle-related non-profit groups who are attempting to serve all ages, abilities and neighborhoods in Charlotte. Descriptions of these efforts are located within the appropriate following chapters.

Charlotte BIKES intends that all of the strategies identified under the remaining five “E’s”, as well as any city-sponsored bicycle program initiatives reflect the plan’s vision of an inclusive cycling environment.

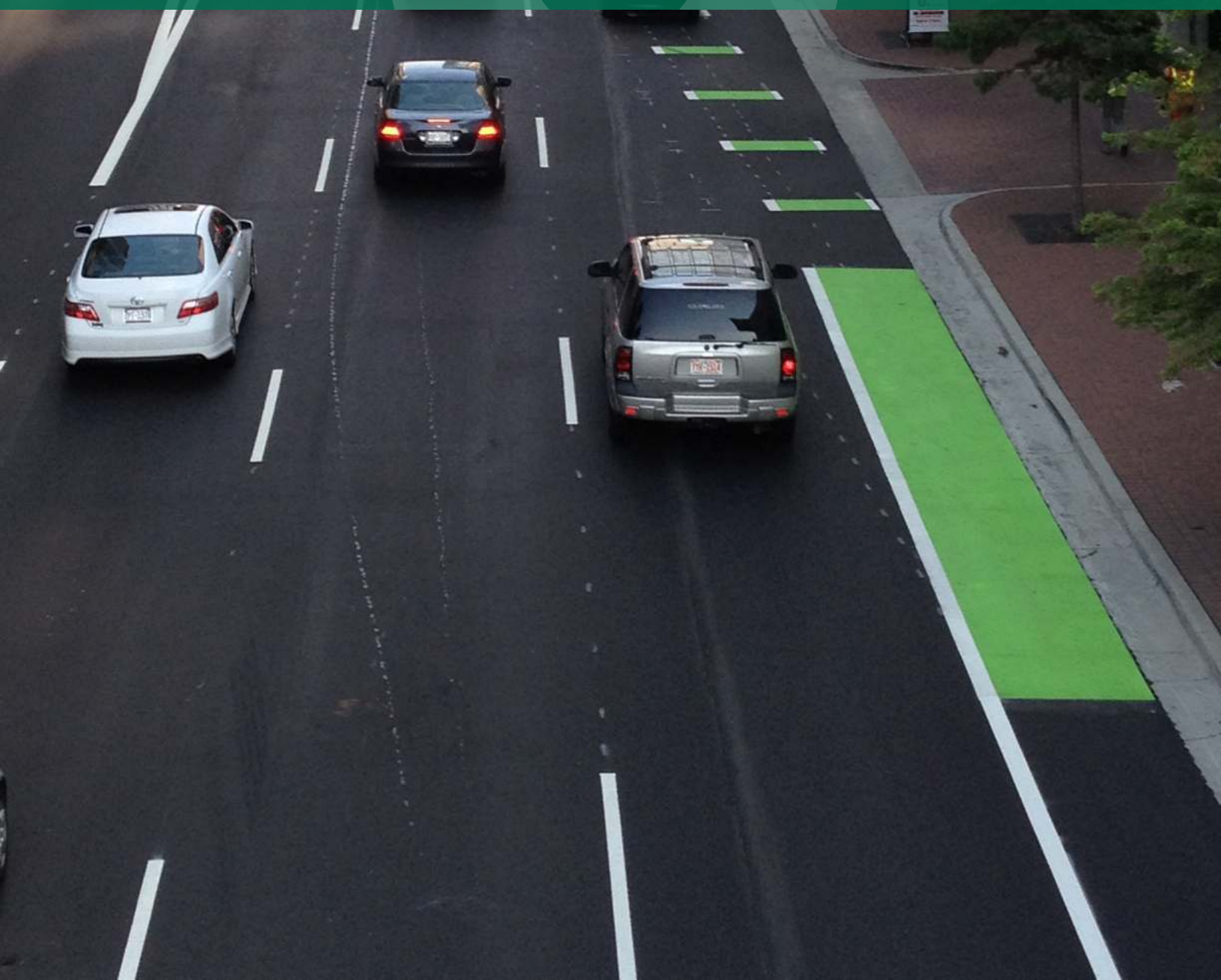






ENGINEERING

Creating Safe and Convenient Places to Ride





GOAL:

The City will create a safe, comfortable and convenient network of bicycle facilities that aid and encourage cycling for people of all ages, abilities and interests, in all areas of Charlotte.

Challenges

Charlotte's Context

Charlotte experienced most of its growth after the 1950s, when increasingly widespread automobile ownership allowed residents to spread further out and transportation professionals to focus almost exclusively on moving automobile traffic as efficiently as possible. The resulting development pattern is characterized by independent land uses separated by long distances, with little connectivity and a significant dependence on thoroughfares to connect destinations in Charlotte.

In recent years, there has been a renewed interest in infill and mixed-use developments, which benefit bicyclists by reducing the distance between likely destinations. Unfortunately, the street and thoroughfare network will require extensive work to provide additional connectivity and retrofit bicycle facilities on Charlotte's relatively narrow thoroughfares.

Many of Charlotte's thoroughfares are relatively narrow in width, do not provide room for dedicated bicycle facilities, and often represent the only connection between two points. In many cases, a lack of parallel street connectivity removes the option of bicycling on comfortable, low-volume, low-speed local streets.



Much of Charlotte's existing development was designed to be disconnected from each other.



Charlotte has many 4-lane thoroughfares that were designed solely for motor vehicles.

Bikeway Design Guidance and Trends

The bicycle planning and design context has changed greatly since the adoption of the 2008 Charlotte Bicycle Plan. Since then, an organization called the National Association of City Transportation Officials (NACTO) produced a series of design guides aimed at creating “safe, sustainable, city-friendly street designs... that support safe walking and biking, as well as efficient transit.” NACTO's Urban Bikeway Design Guide introduced many North American cities to the concept of buffered bicycle lanes, protected bicycle lanes, two-way cycletracks, bicycle boulevards, and other treatments beyond the standard bicycle lane.

Many of these bikeway treatments were neither approved nor even mentioned in the design manuals of the American Association of State Highway Transportation Officials (AAHSTO), and were not anticipated during the development of Charlotte's own Urban Street Design Guidelines in 2007 or the previous bicycle plan of 2008. Nevertheless, cities across the country, including Charlotte, have begun implementing innovative solutions to increase safety and reduce conflicts between bicyclists, pedestrians, and automobiles. The Federal Highway Administration (FHWA) recognized these new bikeway treatments with a memorandum in 2013 expressing FHWA's “support for taking a flexible approach to bicycle and pedestrian facility design”, as well as the development of FHWA's own Separated Bike Lane Planning and Design Guide in 2015.



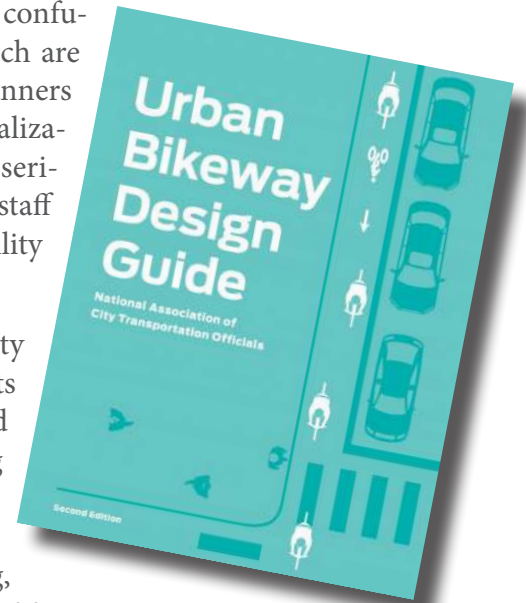
New York City was a pioneer of protected bicycle facilities in North America.





The changing nature of design standards and guidance can lead to confusion and ambiguity about which treatments are permissible, which are experimental, and which are worthwhile. Some engineers and planners may be reluctant to implement unfamiliar geometric designs, signalizations, and policies. As the city strives to significantly decrease serious injuries and fatalities on its roadways, it is important that city staff study and be trained in the state of the practice for bicycle facility design.

The engineering strategies in this plan update will help guide the city toward using the most up-to-date and appropriate bicycle treatments in different contexts. They reflect a transition towards protected bicycle facilities on busier streets to create a comfortable bicycling experience for people of all ages and abilities, and also emphasize that there are many different components to a complete, effective bicycle network, including dedicated bicycle facilities, wayfinding, bicycle-accommodating traffic signals and off-street path opportunities.



Cycletracks in Vancouver, BC

Bicycle Facilities in Charlotte



W 4th St Extension



Freedom Dr



Rozzelles Ferry Road



Little Rock Rd



Fred D. Alexander Blvd



Old Plneville Rd



Remount Rd



Community House Rd



B-Cycle System



Rail Trail & Bike Share



Sedgefield Park Pathway





Carson St Bike Box



Prosperity Church Rd



Beal Street Connector



Green Bike Lanes on E. 4th St



Ballantyne Commons Py & Elm Ln



Hickory Grove Rd



Charlottetown Dr Ped/Bike Tunnel



E. 12th St Cycle Track



Central Ave



Bike Route 1



University City Blvd Path



Shared Lane Markings

Successes

Since the adoption of the previous bicycle plan in 2008, Charlotte has made great strides in building out its bicycle network, including the:

- Striping of 40 new miles of bicycles lanes,
- Installation of 50 new miles of signed bicycle routes over 9 different routes,
- Retrofit of 18 traffic signals with bicycle-specific signal detection,
- Construction of 20 new miles of greenway,
- Installation of green-colored pavement markings in bicycle lane conflict zones,
- Construction of the city's first cycletrack on 12th St.

This growth in bicycling infrastructure was made possible by the bicycle-related policies set in the Transportation Action Plan (2006), Urban Street Design Guidelines (2007), and 2008 Charlotte Bicycle Plan, as well as capital funding for the Charlotte Bicycle Program at \$500,000 in the 2006, 2008 and 2010 transportation bonds.

The City of Charlotte's 2016-2020 Community Investment Plan (CIP) provides funding for a number of projects that will include bicycle facilities as detailed in Chapter 2: Equity. The 2016 Transportation Action Plan Update recommends \$4 million per year dedicated to a bicycle program, which would allow the city to more systematically implement infrastructure projects city-wide, rather than only as part of specific CIP transportation projects. Chapter 8 details what \$4 million of bicycling-specific funding would achieve for engineering and other efforts.





Strategies for Engineering



The City will require bicycle facilities on all new or reconstructed roadways within the city, across or under bridges and underpasses, and in association with transit projects. Where facilities are not feasible, justifications for omitting facilities will be included as part of the design process and alternative routes identified.

Performance Metric

- ▶ Expand the network of bicycle facilities.

Performance Target

- ▶ 10 new miles of bicycle facilities per year



EG-2

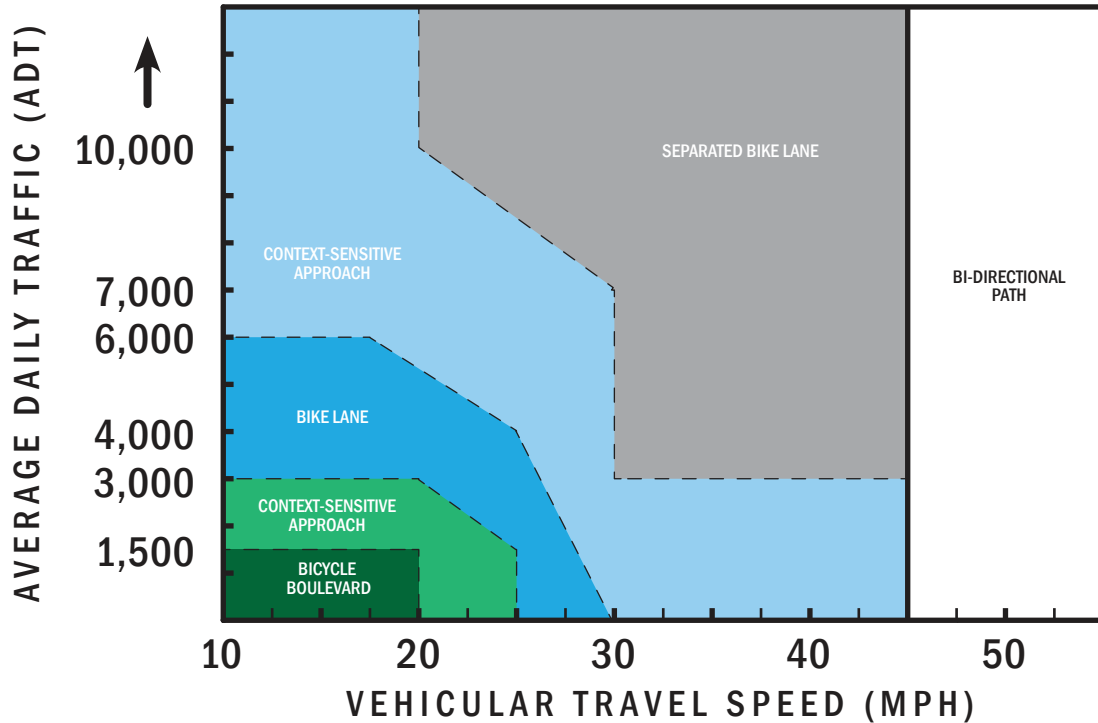
The City will seek to provide safe and comfortable bikeways, as recommended in the figure below, using the latest bikeway design guidance from the American Association of Highway Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), and the National Association of City Transportation Officials (NACTO).







Performance Metrics

- ▶ Application of the Bicycle Facility Selection Matrix (See Appendix A) in design decisions.
- ▶ Increase miles of buffered and separated bicycle facilities.

Performance Targets

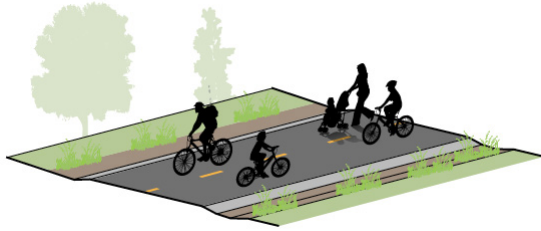
- ▶ 10 new miles of bicycle facilities per year.
- ▶ Two miles of new buffered bicycle lanes and one mile of new separated bicycle lanes per year.



-  These speeds are generally inappropriate in an urban setting, and a path may be a viable facility type.
-  A separated bike lane facility is appropriate in this speed and volume range
-  A bike lane may function here, but additional separation is preferred. Consider providing additional width in the form of a painted buffer or physical separation.
-  A bike lane facility is appropriate in this speed and volume range
-  A bicycle boulevard may function here, but consider additional traffic calming and access management in order to improve conditions.
-  A bicycle boulevard may function here, but consider additional traffic calming and access management in order to improve conditions.

Descriptions of bicycle facilities are located on the following page.





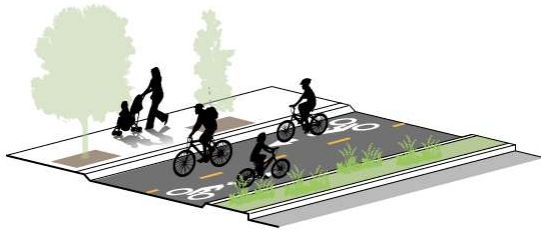
BI-DIRECTIONAL PATH

Non-motorized pathway in an independent right of way or parallel to a roadway.



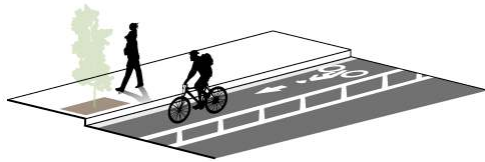
ONE-WAY SEPARATED BIKE LANE

Physically separated bike lanes. Also known as a cycle track or protected bike lane.



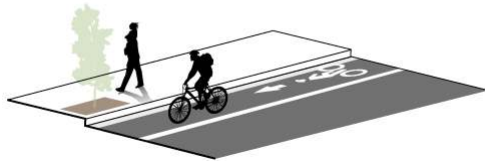
TWO-WAY SEPARATED BIKE LANE

Physically separated bike lanes designed for bi-directional use.



BUFFERED BIKE LANE

On-street bike lanes paired with a designated buffer space.



ON-STREET BIKE LANE

On-street bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage.



BICYCLE BOULEVARD

Bicycle boulevards are low-volume, low-speed streets designed to prioritize bicyclist travel and discourage motor vehicle travel along the route and across intersections. Also known as “neighborhood greenways,” “quiet streets,” etc.



SHARED ROADWAY

Shared roadways (which may be designated bike routes) are roadways without dedicated bicycle facilities. Shared Lane Markings (SLM) may be included.



The City will continue to increase the number of signalized intersections that detect bicyclists.

Performance Metric

- ▶ Inventory of traffic signals which do not properly detect bicycles, prioritize and increase the number of signalized intersections along key bicycle corridors that are capable of detecting bicyclists.

Performance Target

- ▶ Inventory ongoing as bicycle corridor routes are identified and implemented.



The City will transition from the existing signed, numbered bicycle route system to a wayfinding system consisting of destination and distance information on key bicycle corridors.

Performance Metrics

- ▶ Development of criteria for implementing a bicycle wayfinding package consisting of destination and distance information.
- ▶ Bicycle Advisory Committee review on proposed additions and modifications to the bicycle wayfinding system.
- ▶ Increase in new/modified bicycle routes with wayfinding information.

Performance Targets

- ▶ Develop criteria by end of 2017.
- ▶ Ongoing
- ▶ Identify 25 miles of bicycle corridors with wayfinding by 2022.



The City will use innovative approaches to bicycle facilities where appropriate, including green lanes and markings, signage, bike boxes and other facilities or facility types found in the NACTO Urban Bikeway Design Guide or AASHTO Guide for the Development of Bicycle Facilities.

Performance Metric

- ▶ Increase in the number of green colored pavement markings in conflict zones.

Performance Targets

- ▶ Implement five new conflict zone treatments per year.





The City will pursue the implementation of a network of off-road bicycle trails and routes along utility corridors, rail corridors, greenways and other potentially useful corridors for bicyclists.

Performance Metric

- ▶ Evaluate and identify potential off-road, shared-use path projects for potential projects that benefit the bicycle network.

Performance Target

- ▶ Complete study complete by 2019.



The City will seek to improve bicycle connectivity through the construction of bicycle/pedestrian connectivity projects, and consider lowered speed limits and/or traffic calming approaches on bicycle corridors.

Performance Metric

- ▶ Increase bicycle connectivity.
- ▶ Identify traffic calming solutions in conjunction with the implementation of bicycle corridors.

Performance Target

- ▶ Complete at least one connectivity project per year.
- ▶ Ongoing with implementation of bicycle corridors.



The City will seek opportunities to provide bicycle facilities through the resurfacing process or other routine maintenance activities.

Performance Metric

- ▶ Monitor future CDOT and NCDOT resurfacing lists for lane or road conversion opportunities.
- ▶ Discuss and address service provider impacts resulting from the development of separated bicycle lanes.

Performance Target

- ▶ Ongoing
- ▶ Ongoing as projects develop.



EDUCATION

Giving People the Skills and Confidence to Ride



GOAL:

The city will seek to sponsor, participate in, and encourage educational opportunities for people of all ages and abilities within our community to encourage safe cycling and driver awareness of bicycles.

Challenges

In the United States, bicycling education is addressed very differently than the education provided when learning to drive a motor vehicle. In North Carolina, the state supports 36-hours of classroom and behind-the-wheel driver training through the local school districts, available to anyone between the ages of 14 and 18 for the low cost of \$65. When a driving student desires to acquire a license, they must pass a test covering the driver's license, they must pass an exam testing the driver's knowledge of road signs, driver's knowledge, and driver's skills. However, driver's may not be tested at all on the various laws related bicycling, even if bicyclists are addressed in the North Carolina Driver's Handbook.



In comparison, a person on a bicycle, also considered a vehicle by state law (N.C. G.S. § 20), can take to the road with no publicly-sponsored training as early as they're willing to pedal down the street. If they're young, a parent or guardian may impart a few tips before they begin riding, and this inherited training is often the only education provided to a bicyclist operating on a city's streets.

When bicycle education classes do exist in a community, they are often conducted by non-profit organizations and volunteers, with limited resources and availability. When public resources are committed to education, it is often in the form of "safety promotion" with pamphlets encouraging helmet use and proper hand signals.

A lack of systematic bicycle education in a community does not empower many people to bicycle due to a lack of knowledge on safe bicycling habits, nor does it inform motorists on how to safely interact with bicyclists on the city's streets.

Successes

Since the adoption of the previous bicycle plan in 2008, Charlotte has seen a growth in bicycle education opportunities, almost all of which have been community-driven. Some of the recent educational-related initiatives in the community include:

Learn to Ride

Learn to Ride is a not-for-profit, 100% volunteer series of events to grow Charlotte's cycling community one new cyclist at a time.

The concept was first tested in 2014 when 60 kids turned up to learn how to ride a two-wheeler without training wheels...in the rain!

The event series focuses on getting kids of all ages (and grown-ups, too!) to ride a two-wheeler





using the tried-and-true “balance bike” method. Since the first event, 6 additional Learn to Ride events have been held, with an average attendance of over 150. Due to the overwhelming success of Learn to Ride, the organizers are now planning to conduct 5-6 events per year on Mecklenburg County Park & Recreation facilities in different parts of the county.

Learn to Ride is made possible by a partnership among Bicycle Sport, Charlotte-Mecklenburg Schools, Trips for Kids Charlotte and well-run media + marketing, with support from Mecklenburg County Park and Recreation and Public Health and Sustain Charlotte.

Cycling Savvy

Cycling Savvy is the only regularly scheduled, adult-targeted bicycle education classes currently operating in Charlotte. Cycling Savvy is offered through the American Bicycling Education Association (<https://abea.bike>). The three-day workshop focuses on “empowering people to use their bikes to go anywhere they want, safely and confidently.” The workshop covers bicycle driving fundamentals, and focuses on teaching novice or experienced riders how they can improve their bike riding experience through education, preparation, planning and experience. A local resident and certified Cycling Savvy instructor began offering the courses in Charlotte on December 2014, and over 100 riders have now been taught to safely and confidently bicycle on the streets of Charlotte (as of October, 2016). Charlotte is one of the fastest growing Cycling Savvy locations in the country.



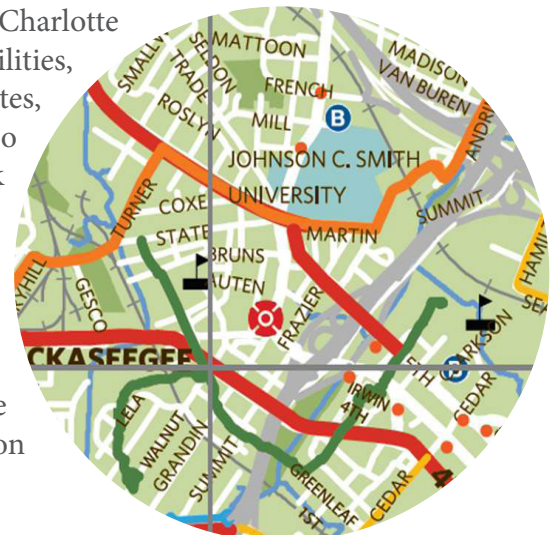
Let's Go NC

The NCDOT and NC State University’s Institute for Transportation Research and Education (ITRE) developed and published a bicycle education program targeted at elementary age children. The lessons plans and videos teach elementary age children how to walk and bike safely, giving them the essential skills that they need to enjoy a healthy and active lifestyle. These resources remove the burden of creating a bicycle education plan from scratch, but are up to local communities and school districts to implement.

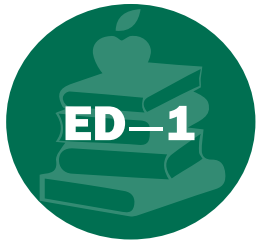


Charlotte Cycling Guide

The Charlotte Bicycle Program has produced three editions of the Charlotte Cycling Guide. This guide provides a city-wide map of bicycle facilities, including bicycle lanes, signed bicycle routes, greenways and off-street paths. The map also includes suggested bicycle routes that link other facilities together generally using low-volume, low-speed streets. The guide also has resource information, including bicycle safety tips and community cycling resources. Thousands of these maps have been distributed to local bicyclists and shops over the three editions, with the most recent edition published in 2015.



Strategies for Education



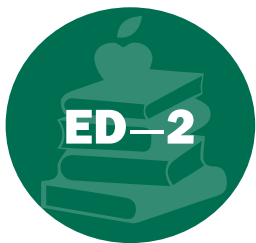
The City will participate in opportunities to communicate the city's bicycle plan, vision and related efforts to city staff, city boards and commissions, local organizations and citizens.

Performance Metrics

- ▶ City staff participation for bicycle education and encouragement purposes.
- ▶ Use social media for outreach.

Performance Targets

- ▶ City staff will participate in at least four public events per year.
- ▶ Create and use social media accounts by the CDOT bicycle program



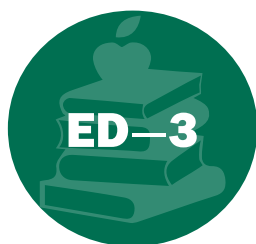
The City will support initiatives that educate bicyclists of their responsibilities and safe bicycling habits.

Performance Metrics

- ▶ Continue offering bicycle education classes for adults and children through local non-profits.
- ▶ Distribute safety equipment at public events.

Performance Targets

- ▶ Offer monthly bicycle education targeted at adults and children.
- ▶ Distribute 50 bicycle lights per year.



The City will work with government and community partners to support Safe Routes to Schools initiatives.

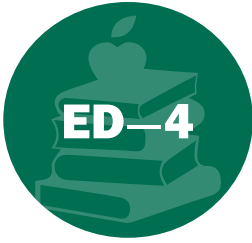
Performance Metrics

- ▶ Partner to support initiatives such as bicycle parking at schools, the incorporation of a bicycle curriculum in public education, or evaluating and helping educators interested in increasing walking and bicycling by students.

Performance Targets

- ▶ Ongoing





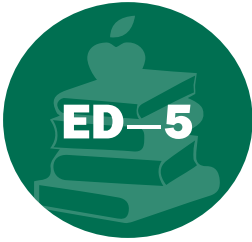
The City will develop maps, written materials and on-line resources to assist cyclists in selecting routes and promote bicycling.

Performance Metric

- ▶ Maintain an updated Charlotte Cycling Guide.

Performance Target

- ▶ Publish an updated, physical copy of the Charlotte Cycling Guide every three years and offer an up-to-date online Charlotte Bicycle Facilities map on an ongoing basis.



The City will support efforts to educate both bicyclists and motorists about safe and courteous operation on city streets.

Performance Metrics

- ▶ Provide bicycle awareness to CATS bus operators.
- ▶ Bicycle program participation on transportation-themed education and awareness campaigns.

Performance Targets

- ▶ Provide a bicycle awareness and safe operation presentation to each new operators' class.
- ▶ Ongoing



ENCOURAGEMENT

Creating a Culture That Promotes and Welcomes Bicycling

GOAL:

The City will identify initiatives, offer incentives and support efforts to promote bicycling and create a welcoming environment for bicyclists.



Challenges

In a city where the dominant transportation mode is the motor vehicle, people often need some encouragement to try moving about in a different way. Most people willingly acknowledge the environmental and social benefits of bicycling, but it usually takes a more personal touch to encourage someone to try bicycling for themselves. This type of support is particularly important in a city where the majority of residents don't currently believe it's easy to bicycle, but are interested in riding more.

The promotion and encouragement of bicycling faces a number of headwinds. First, the automobile industry represents one of the largest advertising sectors in terms of spending. In 2015, General Motors and Ford Motor Company represented the 3rd and 6th largest marketers in the United States with a combined expense of \$6.2 billion (Ad Age, 2016). The advertising budgets for these two companies alone were larger than the revenue of the entire bicycle industry in 2015 at \$5.3 billion (National Bicycle Dealers Association, 2015). Simply put, bicycle promotion competes with one of the most profitable, prolific advertising sectors which is aimed at encouraging people to drive.

Encouraging people to try bicycling or bicycle more requires a comprehensive approach that ultimately addresses the automobile-centric transportation culture that exists in Charlotte. It means creating an environment where bicycling is perceived as simply another easy, routine way to get around. Currently, a potential bicyclist in Charlotte has to first overcome a number of questions about everything from type of clothing, to knowledge of their route, and information about their destination.

A bicycle-friendly culture exists when the answers to these questions are easy and intuitive for anyone who is interested in riding a bicycle. This means creating a culture where ambassadors and programs exist to mentor the bicycle-curious. It means hosting events and workshops that lower the barriers to bicycling and encourage people to try bicycling in an unintimidating environment.

Successes

Bike! Charlotte

The city has sponsored Bike! Charlotte since 2001, an initiative that has grown to become a two-week long series of bicycling-themed events encouraging Charlotteans to explore their city by bike. 2016 Bike! Charlotte kicked off with a "Mayor's Ride to Breakfast", and bicycling advocates, clubs, shops, and area businesses sponsor individual events under the Bike! Charlotte theme. The 2016 event featured a diverse agenda of exciting activities and promotions for all to enjoy, many of which were free.

Many cyclists have questions like these that can affect whether or not they choose to ride.

- ▶ *Do I have the right "gear"?*
 - *Does my bike work?*
 - *How can I carry stuff?*
 - *Do I need a lock? What kind?*
 - *What should I wear?*
- ▶ *What route should I take? Can I avoid busy roads?*
- ▶ *Will I have a place to park my bike?*
- ▶ *Do I have a place to freshen up when I get there?*
- ▶ *Will I be looked at differently because I rode a bike?*





Charlotte B-Cycle Bike Sharing System

Charlotte B-Cycle was launched in 2012 by Charlotte Center City Partners with support from the City of Charlotte and funding from private sponsors. Charlotte B-Cycle provides residents' and visitors the opportunity to buy either a 24-hour or annual membership that grants access to the system's 200 bikes distributed over 24 stations.

The B-Cycle program lowers barriers to bicycling by providing easy, affordable access to bicycles. In 2015, Charlotte B-Cycle enabled 52,000 trips among 15,000 daily members and 676 annual members.



Open Streets 704

Charlotte hosted its first two Open Streets events in May and October of 2016. The *Open Streets 704* events temporarily closed streets to automobile traffic on Sunday afternoons so that people could use them for walking, bicycling, dancing, playing, and meeting their neighbors. The events encouraged people to experience bicycling on approximately 3 miles of car-free city streets, connecting a series of neighborhoods. Each event had an estimated attendance of over 10,000, and attendees represented a broad cross-section of the community. Two additional *Open Streets 704* events are programmed for 2017, and the organizing team will target different areas and neighborhoods of the City for each event. The funding for the first four *Open Streets 704* events was made possible through a grant from the John S. and James L. Knight Foundation, and a sponsorship from Blue Cross Blue Shield of North Carolina will allow the event to continue in the future.

OPENSTREETS704
a day of car(e) free streets

Bicycle Benefits

The Bicycle Benefits program was introduced in Charlotte in 2013. Bicycle Benefits encourages residents to bike more regularly to more places by providing discounts at participating local businesses to customers who arrive by bike. Bicycle Benefit memberships can be purchased for a small fee (\$5 for a helmet sticker or \$7.50 for a card) at participating local businesses. The discounts reward residents who travel by bike. The Charlotte Bicycle Benefits program is one of the largest in the country, with over 170 participating local businesses as of October, 2016.



Community-led bicycle rides and events

Many people are introduced to bicycling through community events and group bicycle rides. Charlotte has had a strong recreational bicycling culture and group ride presence for decades. Many Charlotte bicycle shops and bike clubs host rides for recreational road or mountain bikers.

Whereas bicycle clubs and events were traditionally geared toward road bicycling and fitness, there has been a more recent emergence of social bicycle rides targeted at casual bicyclists. These social rides are intended to be approachable for even the most inexperienced rider or one who doesn't care for the more competitive and serious aspects of the typical group ride. A sampling of these social bike rides and events are on the following page.

Charlotte's many bicycle clubs and organizations play a central role in encouraging more people to bicycle. Below is a sample of some of the clubs and programs that help promote bicycling:



**CHARLOTTE
SPOKES
PEOPLE**



**QUEEN CITY
JOYRIDES**

weeklyrides.com
GET YOUR RIDE ON



**THE UNKNOWN
BIKE & BREW**
SATURDAYS AT 2:30PM

CRANKMAFIA



Social Club with a Biking Problem





PLAZA-MIDWOOD TUESDAY NIGHT RIDE

This weekly, casual ride has attracted a large following, and travels through many of Charlotte's in-town neighborhoods.



Photo © Street Ghost

SUNDAY SLOW RIDERS

This intentionally slow-paced ride offers riders of all ages and abilities a chance to experience bicycling on city streets each Sunday afternoon.



QUEEN CITY JOYRIDES

This Charlotte B-Cycle initiative partners with groups and individuals to implement short, family-friendly bicycle rides throughout the city.



BIKETOBERFEST

Sustain Charlotte's event and fundraiser is a family-friendly urban scavenger hunt by foot, bike or transit that shows people how easy it is to get around South End and Center City without driving.



WOMEN ON WEDNESDAYS

This monthly ride offering fellowship for women apart from most male-dominated bicycle rides.



BIKE-TO-SCHOOL FRIDAYS

This teacher assistant-led ride encourages students to start and end their school day with a ride from Freedom Park to Park Road Montessori and back.



Strategies for Encouragement



The City will provide publicly-accessible bicycle parking at appropriate locations and strictly enforce the zoning code provisions as they relate to bicycle parking on private properties.

Performance Metrics

- ▶ Incorporate the *Essentials of Bike Parking* guidelines of the Association of Pedestrian and Bicycle Professionals as the chief guidance for bicycle parking in Charlotte.
- ▶ Provide or install bicycle racks at locations both within the right-of-way and to publicly-accessible locations on private property on an as-needed basis as determined by CDOT's Bicycle Program.
- ▶ Facilitate implementation of bicycle parking corrals in on-street parking locations when supported by adjacent businesses and property owners.

Performance Targets

- ▶ Revise city ordinances as needed.
- ▶ Install at least ten new publicly-accessible bicycle racks per year.
- ▶ Ongoing as requested



The City will continue to support efforts to operate, sustain and expand bike share in Charlotte.

Performance Metric

- ▶ Provide technical support to the Charlotte B-Cycle system and other bike share operators in Charlotte.

Performance Target

- ▶ Ongoing





The City will sponsor annual and singular events to provide bicycle encouragement opportunities and raise awareness of bicycling.

Performance Metrics

- ▶ Promote the annual Mayor’s Bike to Breakfast Ride as an event which demonstrates the city’s support for bicycling.
- ▶ Continued sponsorship and support of Bike! Charlotte, with a range of bicycle-related events targeting bicyclists and potential-bicyclists of all ages and abilities.
- ▶ Continued participation and promotion of *Open Streets 704* events as a tool to encourage residents to experience Charlotte’s streets by walking or bicycling.
- ▶ Support Bicycle Advisory Committee-sponsored rides to educate bicyclists on the role and work of the Bicycle Advisory Committee.

Performance Targets

- ▶ Annual occurrence of the Mayor’s Bike Ride.
- ▶ Annual occurrence of Bike! Charlotte.
- ▶ Ongoing participation in *Open Streets 704* events.
- ▶ Bicycle program support and participation in Bicycle Advisory Committee rides as requested.



The City recognizes the importance of external groups and individuals who promote bicycle rides and events in the community, and will give assistance to these groups where feasible.

Performance Metric

- ▶ Bicycle program coordinator or designee participation in at least four community rides per year.

Performance Target

- ▶ Ongoing



The City will celebrate the ongoing progress towards creating a bicycle-friendly community, and work toward a Silver Bicycle Friendly Community designation from the League of American Bicyclists.

Performance Metrics

- ▶ City participation and assistance in Bike Month, Bike to Work and Bike to School days.
- ▶ Apply for and be designated a silver-level Bicycle Friendly Community status from the League of American Bicyclists in 2020.
- ▶ Highlight bicycling success stories.

Performance Targets

- ▶ The Bicycle Program Coordinator or designee will participate in Bike-to-Work and/or Bike-to-School Days.
- ▶ Achieve the Silver-level bicycle friendly community status by 2020.
- ▶ Include bicycle testimonials in the annual “Bicycling in the Queen City” report (see EP-3).

WHAT DOES IT TAKE TO GET TO A SILVER-LEVEL BICYCLE FRIENDLY COMMUNITY DESIGNATION?

Charlotte first earned a bronze-level Bicycle Friendly Community rating in 2008, and has been renewed as a bronze-level in 2012 and 2016. The League of American Bicyclists sets the following key measures as targets to achieve a silver-level designation:

KEY OUTCOMES	AVERAGE SILVER	CHARLOTTE
RIDERSHIP <i>Percentage of Daily Bicyclists</i>	2.8%	0.3%
Safety Measure: Crashes <i>per 10,000 daily bicyclists</i>	498	1,107
Safety Measures: Facilities <i>per 10,000 daily bicyclists</i>	8	15.0







ENFORCEMENT

Ensuring Safe Roads for All Users

GOAL:

The City will foster a culture of safety and accountability on Charlotte's streets through the enforcement of traffic laws.

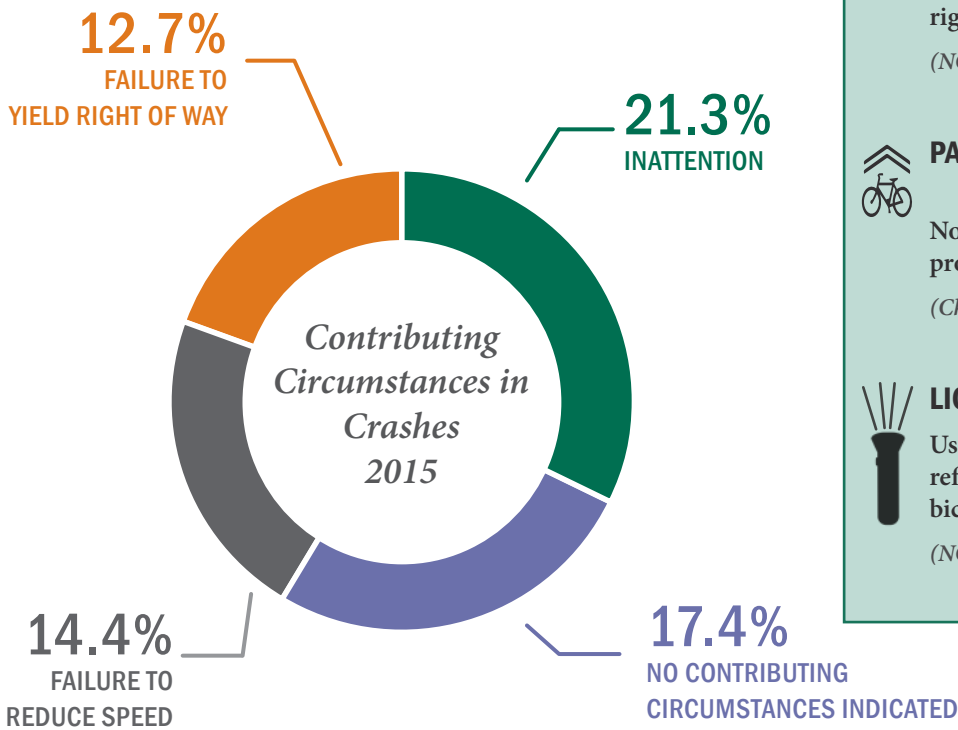


Challenges

Part of becoming a bicycle-friendly city is ensuring that people feel safe and protected when using our city's streets. However, we know that 62 percent of residents don't currently find it easy to ride in Charlotte. The perception of feeling safe has to do with having both the skills and confidence of riding, but also knowing that all of the users of the transportation network safely and courteously share the road.

Since the last bicycle plan was adopted in 2008, bicycle collisions are up 80 percent. Without accurate bicycle ridership trend data, it's difficult to say whether this increase is due simply to a significant increase in bicyclists on the road. Anecdotally, distracted driving seems to be commonplace on the city's streets and a significant concern for bicyclists' safety. Statistically, "inattention" was the most frequently cited contributing circumstance in Charlotte for the over 27,000 collisions in 2015. "Failure to reduce speed" and "failure to yield the right of way" were the other most frequently cited circumstances leading to a collision.

As any bicyclist can attest, distracted driving, speeding, and failure to yield are three of the greatest challenges when bicycling on the city's streets. Distracted driving is a difficult habit to mitigate, but enforcement will be necessary to reduce bicycle collisions. Speeding and failure to yield the right-of-way can be addressed with more emphasis on traffic enforcement.



NORTH CAROLINA TRAFFIC LAWS THAT CAN INCREASE BICYCLIST SAFETY IF FOLLOWED AND ENFORCED



DISTRACTED DRIVING

Texting-while-driving is illegal in North Carolina, as is using a cellphone if under the age of 18

(NC Gen. Stat. §20-137.3/4)



OVERTAKING

Leave at least 2' where passing another vehicle

(NC Gen. Stat. §20-149)

Leave at least 4' when overtaking a bicyclist when passing is otherwise prohibited

(NC Gen. Stat. §20-150(E))



POSTED SPEED LIMITS

Operate at reasonable and prudent speeds, and obey posted speed limits

(NC Gen. Stat. §20-141)



STOPPING AT RED LIGHTS/SIGNS

Drivers of vehicles must obey stop signs, traffic signals and yield the right-of-way

(NC Gen. Stat. §20-141)



PARKING IN BICYCLE LANES

No parking where parking is prohibited by no parking signage

(Charlotte City Code, 14-216)



LIGHTS AT NIGHT

Use a front light and a rear light or reflective vest visible from 300' when bicycling at night

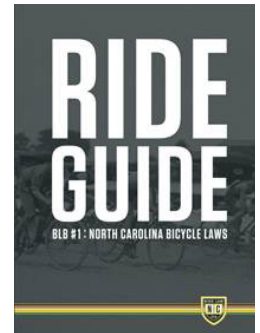
(NC Gen. Stat. §20-129)





Another challenge regarding enforcement is the general lack of knowledge about bicyclists' and motorists' rights and responsibilities when sharing the road. As mentioned in the education chapter, a key challenge is simply educating and testing road users about federal and state traffic laws. It also requires law enforcement to be educated on traffic laws as they apply to bicyclists and motorists, and hold violators accountable, whether they're ignorant about the laws or not.

Another concern mentioned by bicyclists is a general lack of accountability when collisions occur, from a lack of citation or inadequate charges, to the difficulty of ensuring proper penalties are applied through the legal system.



The "Ride Guide" developed by Bike Law NC is a useful handbook for explaining North Carolina bicycle laws and safety information.

Successes

Since the adoption of the previous bicycle plan in 2008, enforcement initiatives that improve the safety of bicyclists include:

Watch 4 Me NC Campaign

Watch for Me NC is a comprehensive campaign, run by the NC-DOT in partnership with local communities, aimed at reducing the number of pedestrians and bicyclists hit and injured in crashes with vehicles. Charlotte has been a partner in the program since 2015. The campaign includes enforcement events targeting dangerous behaviors from motorists, pedestrians and bicyclists, as well as safety information distributed through numerous avenues, including billboards, radio advertisements, media coverage, water bill inserts, and outreach efforts.



CMPD Bicycle Patrol

The CMPD bicycle patrol emerged out of an effort to encourage more community policing. Bicycles are seen as a tool to make officers more approachable to citizens, while providing officers a maneuverable vehicle in an urban setting. Charlotte has approximately 30 full-time officers who patrol on bikes, with another 100 or so who ride part-time. In order to qualify for bicycle patrol, officers must complete a 40-hour basic bicycle training course.



Strategies for Enforcement



The City will implement tools that support a Vision Zero initiative, as identified in the 2016 Transportation Action Plan update.

Performance Metric

- ▶ Install red light enforcement cameras and/or speed enforcement cameras.

Performance Target

- ▶ TBD



The City will encourage dialogue between the Charlotte-Mecklenburg Police Department and bicyclists.

Performance Metrics

- ▶ CMPD will designate a point-person for bicycling issues.
- ▶ CDOT and CMPD will collaborate efforts toward creating a bike-friendly city.

Performance Targets

- ▶ A CMPD representative will attend the Bicycle Advisory Committee at least once per year.
- ▶ Ongoing



The City will consider targeted enforcement/awareness campaigns to encourage safe roadway behaviors, to include speeding on key bicycle corridors, parking in designated bicycle lanes, yielding at shared-use path crossings, shared-use path etiquette, and distracted-driving.

Performance Metric

- ▶ The bicycle program and law enforcement officers will participate in the NCDOT *Watch-for-Me NC* safety campaign and other similar events intended to increase awareness of roadway responsibilities of motorists, cyclists and pedestrians.

Performance Target

- ▶ Continued city participation in the NCDOT *Watch-for-Me NC* campaign, with at least one targeted enforcement campaign per year.





The City will continue to include bicycle police as part of the patrol force.

Performance Metric

- ▶ Bicycle police will continue to patrol Center City, pathways and other areas where bicycle patrols are practical.

Performance Target

- ▶ Ongoing CMPD bicycle patrols.



The City will offer bicycle education to local law enforcement officers.

Performance Metric

- ▶ Offer opportunities for police officers to receive training on laws related to bicycling.

Performance Target

- ▶ Discuss integrating bicycle training into police training.



The City will maintain crash data related to bicycles and seek solutions to identified problem areas.

Performance Metric

- ▶ Law enforcement will provide bicycle crash reports and similar data to CDOT to help identify continuing problems or locations with a significant history of crashes.

Performance Target

- ▶ Ongoing



EVALUATION / PLANNING

Planning for Bicycles and Analyzing Results

GOAL:

The city will plan for and evaluate Charlotte's progress in becoming a bicycle-friendly community.



Challenges

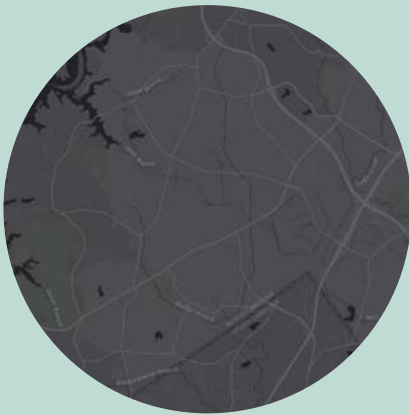
Charlotte's nearly 300 square miles of land area consists of many different land use and transportation contexts. Planning for a rapidly evolving transportation network in a rapidly growing city presents challenges and opportunities. Bicycling can play an increasingly important role in this growing city, but it requires developing plans and strategies to most effectively implement a bicycle network throughout Charlotte.

As discussed in the engineering chapter, Charlotte's relatively narrow thoroughfare widths and lack of local street connectivity in many parts of the city require the city to think strategically about creating a bicycle network. Rather than relying on a network of low-volume, local streets paralleling thoroughfares, Charlotte's bicycle network will require an entire toolbox of bicycle facilities, from dedicated facilities on thoroughfares, bicycle wayfinding and traffic-calming treatments on local street connections, and off-street paths such as greenways and the Cross Charlotte Trail.



The redevelopment of South Boulevard is providing an opportunity to secure space for bicycle lanes.

PLANNED BICYCLE NETWORK EXPANSION IN STEELE CREEK



STEELE CREEK 2005

BICYCLE NETWORK: 0 miles



STEELE CREEK 2025

*BICYCLE NETWORK: 15 miles
Connecting: Ayrley Town Center, Charlotte Premium Outlets, Westinghouse Boulevard employment corridor, Rivergate shopping center, three public schools and numerous subdivisions*

Extending a bicycle network throughout all of Charlotte requires a long-term vision, plans and funding to create bicycle facilities in places where there is currently little or no dedicated bicycle network. The Steele Creek area is an example of an area where long-term planning and investments will create a comprehensive bicycle network where none existed just twenty years prior.

Longer-term planning and capital projects can ensure that bicycle facilities are built where needed, but another challenge is the rapidly evolving state of bicycle facility design. With many cities, including Charlotte, desiring to build a bicycle network that is

inclusive of all ages and abilities, planners and engineers are having to design for new facility types such as protected bicycle lanes and cycletracks on the city's streets. These new designs require training of staff, as well as evaluation of projects to ensure that appropriate facilities are built that safely and comfortably accommodate all ages and abilities of bicyclists.





An emerging tool that allows a city to test implementation of new street designs and bicycle facilities is the concept of “pilot” or “demonstration” projects. Creating bicycle facilities in some of Charlotte’s constrained road space implies trade-offs

One challenge unique to planning for bicycles is a lack of data on where people ride today. In Charlotte, motor vehicle counts are conducted regularly along street segments, and on a two-year cycle at every signalized intersection within the city. In contrast, Charlotte has not routinely counted bicyclists at any location in the city. This lack of data makes it difficult to effectively measure the results of city efforts toward building a comprehensive bicycle network. Fortunately, seventeen dedicated bicycle/pedestrian counters were installed at strategic locations on the bicycle network in 2016 in an effort described in more detail below.

Successes

Since the adoption of the previous bicycle plan in 2008, planning and evaluation initiatives related to bicycling include:

Bicycle/Pedestrian Counter Installations

CDOT, in partnership with the Institute for Transportation Research and Education (ITRE) and the North Carolina Department of Transportation (NC-DOT), has installed seventeen automated pedestrian/bicycling counters at ten different locations. The counters are located on higher-volume bicycle and pedestrian corridors near major destinations, and will provide bicycle user counts on a continual basis. Two of the dedicated pedestrian/bicycle counters will include a real-time display of bicycle and pedestrian use. Mecklenburg County has also installed counters on four different greenways in the city.



Biennial Transportation Survey

The City of Charlotte conducts a biennial, statistically-valid, transportation-focused market opinion survey which covers a variety of topics including bicycling. Telephone interviews are used with a random sampling of landline (58%) and wireless (42%) phone numbers totaling 406 residents. This survey included nine questions about bicycling, and was most recently completed in 2016. Results from this survey can be used to track both community perception about bicycling conditions, as well as frequency of bicycle use.

Crash Database

CDOT maintains a database of all traffic crashes, including bicycle-related crashes, from 1999 to present. Staff receive crash data from the Charlotte-Mecklenburg Police Department daily and check each crash report for accuracy in crash type and location. Bicycle crash data is analyzed in each instance that crash data is requested, either by a citizen or a CDOT employee (signal evaluations, corridor studies, etc.). Each year, CDOT compiles an Annual Report that includes a summary of bicycle crashes and fatal crashes.

Bicycle Facility Planning

Planning for bicycle facilities in a city the size of Charlotte is most effectively done through initiatives such as area plans, corridor studies, and capital project planning.

The city's area planning process provides an opportunity for staff and the public to identify specific bicycle recommendations for streets within each plan's study area. Cross sections are recommended for implementation through both public projects and private sector development.

Corridor studies are transportation-focused reviews of identified street corridors. These studies review current conditions for all modes of transportation with an emphasis on bicycle and pedestrian travel and make recommendations for multi-modal treatments to improve conditions for travel. In 2016, CDOT initiated



studies to identify, for three corridors in the city.

Charlotte's 2014-2020 Community Investment Plan includes funding for implementing infrastructure projects in a number of different areas of Charlotte. Many of the projects underwent preliminary planning in 2015-2016 and included

the identification of desired bicycle network improvements.

Uptown Connects and Pilot Projects

The Charlotte Department of Transportation, in partnership with Charlotte Center City Partners, developed the Uptown Connects Study. The study evaluated options to connect the Little Sugar, Irwin and Stewart Creek greenways and destinations Uptown, and ultimately recommended a comprehensive network of bicycle facilities through Uptown Charlotte.

CDOT is also planning to implement a pilot project to test the recommendations developed through the Uptown Connects study. Pilot projects are a way of testing and demonstrating new street configurations in an inexpensive and interim basis before more expensive, permanent treatments are installed.

Bicycle Advisory Committee



The Charlotte/Mecklenburg County Bicycle Advisory Committee has met monthly since its formation in 2000. The BAC is composed of eleven members. Six of these members are appointed by the Charlotte City Council, three by the Mayor of Charlotte and two by the Mecklenburg County Commissioners. The BAC acts as an advisory body to Charlotte City Council, and provides feedback on bicycle-related plans, projects and initiatives.

CURRENT PLANS AND PROJECTS WITH BICYCLE FACILITY RECOMMENDATIONS

AREA PLANS

- ▶ Northlake Area Plan
- ▶ Catawba Area Plan
- ▶ North Tryon Area Plan
- ▶ University Research Park Area Plan
- ▶ Elizabeth Area Plan
- ▶ Independence Boulevard Area Plan
- ▶ Midtown/Morehead/Cherry Area Plan
- ▶ Steele Creek Area Plan
- ▶ Park/Woodlawn Area Plan
- ▶ Prosperity Hucks Area Plan
- ▶ Blue Line Extension Station Area Plan
- ▶ University City Area Plan

CORRIDOR STUDIES

- ▶ Parkwood Avenue/The Plaza
- ▶ South Boulevard Street
(Uptown to Greystone Road)
- ▶ South Tryon Street
(Uptown to Griffith Street)
- ▶ West Boulevard

CIP PROJECTS

- ▶ Independence Area Sidewalk and Bikeway Improvements
- ▶ Cross Charlotte Trail (XCLT)
- ▶ Northeast Corridor Infrastructure Program (NECI)
- ▶ Comprehensive Neighborhood Improvement Program (CNIP)





*Bicycle Advisory Committee members
(left to right):*

- Paul Benton*
- Buzz Morley*
- Adam Raskoskie*
- Elizabeth Swanzy-Parker*
- Chris Gladora*
- Martin Zimmerman*
- Haley Beaupre*
- Katie Lloyd*
- Robert Boyer*

*Not Pictured: Debra L Franklin
Bryan Hall*



Strategies for Evaluation and Planning



The City recognizes the City/County appointed Bicycle Advisory Committee as the chief citizens' advisory group for bicycle related issues, and will continue to support and receive recommendations from the committee in accordance with its mission and regular meeting schedule.

Performance Metrics

- ▶ Continued operation and Bicycle Program support of the Bicycle Advisory Committee.
- ▶ Maintain a fully-staffed Bicycle Advisory Committee.

Performance Targets

- ▶ Ongoing
- ▶ Fill Bicycle Advisory Committee vacancies with new appointments within three months.



The City will build upon the recent installation of dedicated bicycle/pedestrian counters into a systematic inventory of bicycling use trends.

Performance Metrics

- ▶ Continue operation of the initial bicycle-pedestrian counters in partnership with the NCDOT and ITRE
- ▶ Installation of additional dedicated bicycle/pedestrian counters where warranted.

Performance Targets

- ▶ Ongoing
- ▶ Install additional counters and/or conduct temporary bicycle counts as needed.



The City will provide state-of-the practice bicycle planning and design training to staff and local consultants.

Performance Metrics

- ▶ Provide bicycle-related webinar training for city staff and local consultants.
- ▶ Host in-person training seminars and conferences that are relevant to bicycle planning and design.

Performance Targets

- ▶ The CDOT Bicycle Program will host six bicycle-related training webinars per year.
- ▶ Host one bicycle-related training seminar per year for City staff and/or local consultants.





EP—3

The City will assess and communicate trends in bicycle use, safety and infrastructure implementation, as well as other bicycle-related programming.

Performance Metrics

- ▶ Conduct annual analyses of bicycle crashes to determine problem areas or behaviors.
- ▶ Bicycle-related questions on CDOT’s biennial transportation survey informing current and potential bicycling participation and perceived barriers to more bicycling use.
- ▶ Create an annual “Bicycling in the Queen City” report detailing bicycling ridership and safety data, infrastructure and other programming accomplishments, and suggested priorities for the following year.

Performance Targets

- ▶ Ongoing
- ▶ Update bicycle survey data every other year
- ▶ Produce annual “Bicycling in the Queen City” report.

EP—5

The City may use pilot projects to test potential new roadway designs before further investment in full-scale construction.

Performance Metric

- ▶ Develop bicycle-related pilot projects.

Performance Target

- ▶ Implement pilot projects on a case-by-case basis.

EP—6

The City will monitor statewide transportation policy-making and comment when proposed legislation or policy changes would adversely affect bicycling in Charlotte.

Performance Metric

- ▶ Staff will review and discuss relevant legislation with the Bicycle Advisory Committee.

Performance Target

- ▶ The BAC will discuss and/or act as warranted.

EP-7

The City will establish bicycle corridors that connect destinations and neighborhoods throughout Charlotte and will continue to use corridor studies to develop bicycle facility recommendations tailored to specific streets.

Performance Metric

- ▶ Develop a bicycle corridor map showing connections between destinations using safe and comfortable facilities and recommendations for facility improvements where gaps exist in the network.

Performance Target

- ▶ Develop a bicycle corridor map complete with initial gap recommendations by the end of 2018.

EP-8

The City will work to implement the alignment of the Cross Charlotte Trail as shown on the following page.

Performance Metric

- ▶ Build the Cross Charlotte Trail

Performance Target

- ▶ Complete construction of the Cross Charlotte Trail by 2025.

EP-9

The City will maintain a comprehensive and relevant bicycle plan.

Performance Metric

- ▶ Update the bicycle plan every five years.

Performance Target

- ▶ Adopt a new bicycle plan by 2022.

EP-10

The City will use public feedback to inform planning, design and maintenance of infrastructure.

Performance Metric

- ▶ Development of an online interactive map/form that solicits ongoing feedback on the condition of Charlotte's street network.

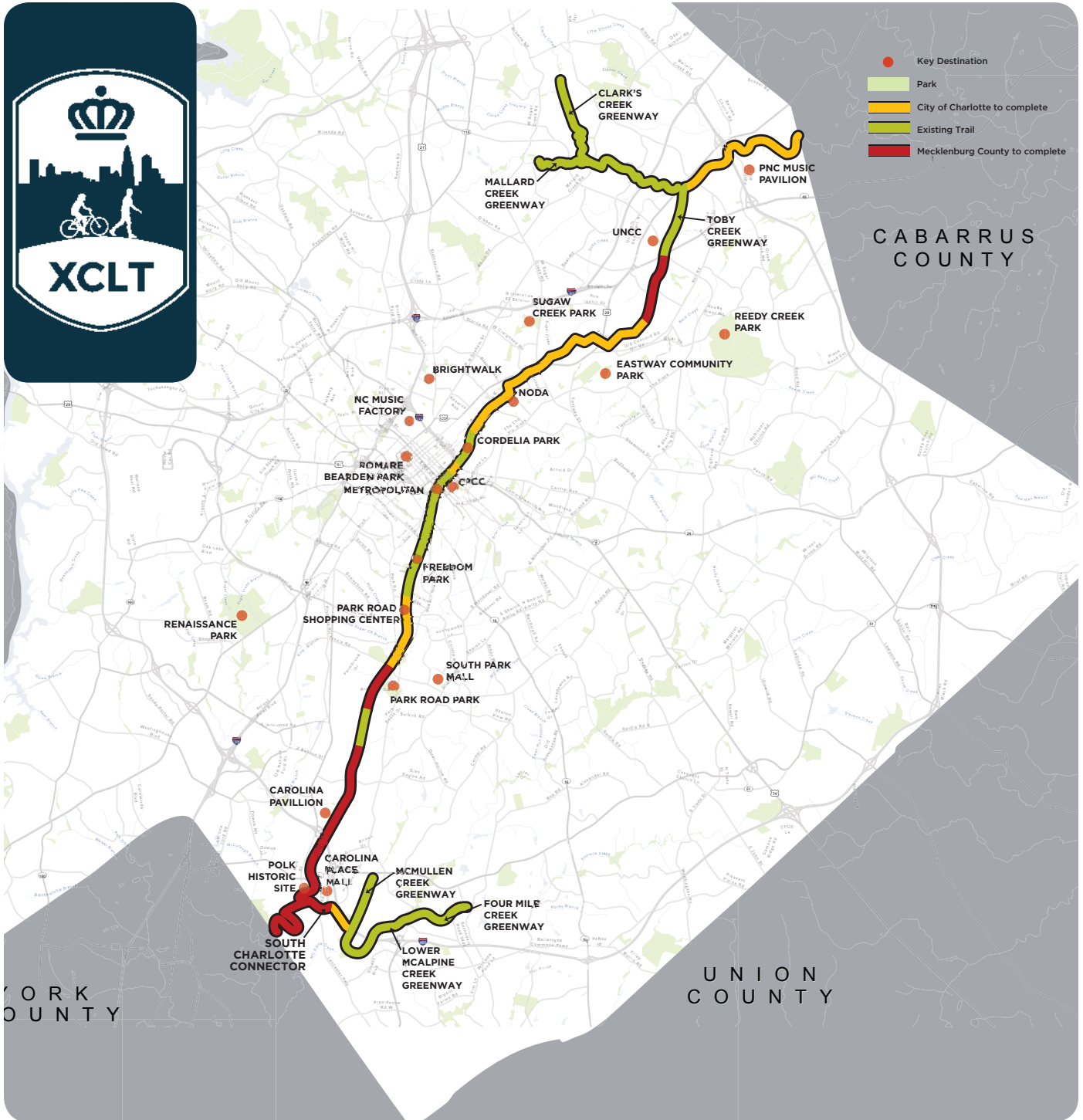
Performance Target

- ▶ Develop an online interactive map and make it available to the public by 2019.





Cross Charlotte Trail Alignment Map



A more detailed alignment can be found at <http://vc.charmeck.org>



BICYCLE PROGRAM INITIATIVES

Introduction

Charlotte’s Transportation Action Plan Update recommends **\$4 million in annual funding** to implement a bicycle program that helps create a bicycle-friendly community. This chapter of Charlotte BIKES details the recommended initiatives that would achieve the vision, goals and strategies of this plan. This includes a range of bicycle-related initiatives addressing all six “E’s” of a bicycle-friendly community, and if fully-funded, represents a significant expansion in bicycle-related activities. Some initiatives represent traditional roles of the city, such as building infrastructure. Others represent an involvement in community efforts, partnerships and programming that will help build a bicycle-friendly culture.

The table on the following page summarizes the recommended bicycle program initiatives by “E”. “Equity” does not receive its own stand-alone expenditure category because it is embedded in each of the other five expenditure categories.



Bicycle Program Initiatives Annual Expenditure Summary Table

ENGINEERING		
Project Name	Project Name	Cost
Bicycle Signal Detection	Install bicycle specific signal detection at 2 signalized intersections per year	\$10,000
Bicycle Wayfinding	Install/modify 5 miles of bicycle wayfinding signage per year and up to 2 miles of shared lane markings	\$45,000
Bicycle Lane Retrofits	Mark 2 miles of bicycle lanes or 1 mile of buffered bicycle lanes per year	\$40,000
Bicycle Boulevards	Install two traffic circles per year or other bicycle boulevard treatments along key bicycle corridors	\$80,000
Green Pavement Markings	Install 5 conflict zone treatments per year	\$75,000
Connectivity Projects	Construct one connectivity project per year	\$120,000
Corridor Implementation	Construct bicycle lanes, protected bicycle lanes and/or shared-use paths recommended in corridor studies or other planning efforts	\$3,300,000
EDUCATION		
Bicycle Education: Children	Partner to provide bicycle education events targeted at children	\$50,000
Bicycle Education: Adults	Partner to provide bicycle education events targeted at adults	\$50,000
ENCOURAGEMENT		
Bicycle Parking	Install 20 bicycle racks per year (at \$500 per rack)	\$10,000
Charlotte Cycling Guide	Produce updated Charlotte Cycling Guide every three years	\$10,000
Bike! Charlotte	Produce and promote a series of bicycle events	\$30,000
Bicycle Program Ambassadors	Communicate the City's vision, promote bicycle-related efforts, and mentor new bicyclists	\$50,000
ENFORCEMENT		
Enforcement Activities	Conduct police training, targeted enforcement campaigns, and distribute safety equipment	\$10,000
EVALUATION / PLANNING		
Bicycle Counts	Install additional dedicated bicycle/pedestrian counters at two per year	\$20,000
Demonstration/Pilot Projects	Implement temporary demonstration projects to test feasibility of implementation	\$50,000
Bicycle Planning	Staff assistance to the Bicycle Advisory Committee, Council, other city/county efforts and the general public.	\$50,000
Total cost of implementing a bicycle program addressing all six "E's"		\$4,000,000

EQUITY





Project Name	Background Information	Cost Assumptions
<p>Bicycle Signal Detection</p> 	<p>CDOT has installed bicycle-specific detection at eighteen different signalized intersections on a total of 32 different approaches. These installations are generally along signed bicycle routes where the existing traffic signal loop does not detect bicyclists. This initiative would modify additional signals for bicycle signal detection, with priority being given along bicycle wayfinding corridors.</p>	<p>Two signalized intersections per year retrofitted with bicycle-specific signal detection (on two approaches) at \$5,000 per approach for design and installation:</p> <p>\$10,000 per year.</p>
<p>Bicycle Wayfinding</p>  <p>D1-2c</p> <p>Figure 9C-9. Shared Lane Marking</p> 	<p>Charlotte has 55 miles of signed and numbered bicycle routes. Feedback from local bicyclists has suggested that a bicycle wayfinding system consisting of destination and distance information would be more effective and useful for most bicyclists. This wayfinding can also serve as an encouragement/education tool in terms of informing residents that there may be a more bicycle-friendly route to common destinations than riding on a thoroughfare. Over time, the bicycle program will transition from the signed, numbered bicycle route system to a wayfinding system consisting of destination and distance information (<i>see MUTCD, Figure 9B-4</i>).</p> <p>Where appropriate, wayfinding signage can be supplemented with shared lane markings to provide additional on-pavement guidance or to encourage proper lane positioning adjacent to on-street parking.</p>	<p>Five miles of new/modified bicycle routes per year at \$5,000/mile for design and installation, and two miles of shared lane markings at \$10,000 per mile for design and installation:</p> <p>\$45,000 per year.</p>
<p>Bicycle Lane Retrofits</p> 	<p>Bicycle lanes are routinely provided as part of capital projects and through resurfacing. However, some opportunities for bicycle lanes exist on a stand-alone basis. In addition, this project would look at streets where a buffered bicycle lane may be created by providing an additional stripe where the outside travel lane or bicycle lane currently had extra width.</p> <p>Specific projects to include:</p> <ul style="list-style-type: none"> • Whitehall Park Drive buffered bicycle lanes • Glenwood Drive from Tuckaseegee Road to Thomasboro Drive 	<p>Two miles of standard bicycle lanes or one mile of buffered bicycle lanes per year at \$10,000 per mile for design and linear striping:</p> <p>\$40,000 per year.</p>




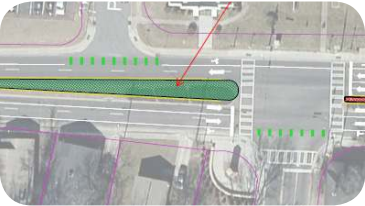
Engineering Initiatives



Project Name	Background Information	Cost Assumptions
<p>Bicycle Boulevards</p> 	<p>Relative to many other cities, Charlotte lacks the street grid that allows continuous, comfortable bicycle connections along local streets that parallel thoroughfares. Nevertheless, there are some local and collector streets that provide key connections for bicyclists, some of which are part of signed bicycle routes. While some bicycle boulevard treatments like traffic diverters may be infeasible in Charlotte due to the lack of parallel, redundant routes, traffic circles and other traffic calming treatments can greatly improve the experience of bicyclists traveling on these streets. Traffic calming can reduce travel speeds while reducing the need for stop signs that reduce efficiency for bicyclists.</p> <p>Specific projects may include:</p> <ul style="list-style-type: none"> • 5th St. along signed bike route 9 • Thomas Ave. along signed bike route 7 • Wedgewood Dr. along signed bike route 2 • Double Oaks Rd. along signed bike route 10 	<p>Two traffic circles per year at \$30,000 each for design and installation:</p> <p>\$80,000 per year.</p>
<p>Green Pavement Markings</p> 	<p>Green pavement markings can be used to assist in bicycle wayfinding and to highlight conflict zones where bicycle and motor vehicle traffic mix. This initiative will install green colored pavement markings per Charlotte DOT criteria and in accordance with Federal Highway Administration guidance.</p> <p>Possible locations include:</p> <ul style="list-style-type: none"> • Stonewall St. between McDowell St. and Charlotte Ave. • East Blvd. adjacent to commercial driveways • Clanton Rd. at I-77 • Freedom Dr. at Toddville Rd. • Fred D Alexander Blvd. at Freedom Dr. • Remount Rd. at South Blvd. • Ikea Blvd. at University City Blvd. • Statesville Rd. at Cindy Ln. • Central Ave. at Sharon Amity Rd. • Colony Rd. at Runnymede Ln • Ardrey Kell Rd. at Lancaster Hwy. • Various intersections along Ballantyne Commons Parkway. • Various shared-use path crossings of driveways and streets 	<p>Five conflict zone treatments per year at \$15,000 each for design and installation:</p> <p>\$75,000 per year</p>

Engineering Initiatives





Project Name	Background Information	Cost Assumptions
<p>Connectivity Projects</p> 	<p>Creating new bicycle connections is one of the most frequently requested improvements from bicyclists. Creating new connections between local streets can allow bicyclists to travel along comfortable local streets rather than thoroughfares. There are a number of potential connectivity projects that would involve opening up barricades and/or constructing a short multi-use path within the public right-of-way. Specific projects may include:</p> <ul style="list-style-type: none"> • Mallard Ridge Drive to Mallard Drive connection/multi-use path • Cedarwood Lane connection/multi-use path • Woodleaf Road connection/multi-use path • Doncaster Drive connection/multi-use path • Hardwick Rd connection/multi-use path • Deveron Dr connection/multi-use path • Eastover Rd to Museum Plaza connection/multi-use path • Cambridge Rd to Marsh Road connection/multi-use path • Iverson Way extension to Poindexter Pl. connection/multi-use path 	<p>One connectivity project per year at \$120,000 each:</p> <p>\$120,000 per year.</p>
<p>Corridor Implementation</p> 	<p>The City of Charlotte identifies specific bicycle facility improvements through corridor studies, area plans and specific bicycle/pedestrian studies such as Uptown Connects. However, these facility improvements are typically large-scale in both scope and impact, and often require substantial funding to implement. This initiative would provide the funding to implement bicycle improvements that would provide significant improvements to the bicycle network.</p>	<p>Various projects consisting of shared-use paths, protected bicycle lanes, and two-way cycletracks:</p> <p>\$3,300,000 per year</p>








Education Initiatives

Project Name	Background Information	Cost Assumptions
<p>Bicycle Education - Children</p> 	<p>The Charlotte Bicycle Program will partner with the Learn to Ride organization, the Carolinas Center for Injury Prevention and other community partners to conduct bicycle education targeted towards children. These courses will teach children how to safely ride on city streets, and educate about the various types of bicycle facilities being installed throughout Charlotte. If additional funds were available, a dedicated course could be constructed for bicycle safety education.</p>	<p>Staff or contractor time for coordination, plus equipment and material assistance:</p> <p>\$50,000/year.</p>
<p>Bicycle Education - Adults</p> 	<p>The Charlotte Bicycle Program will partner with existing or new bicycle education instructors to provide monthly bicycle education classes. These classes would offer a standardized curriculum that trains attendees on how to safely and confidently bicycle throughout Charlotte. Funds would be used to provide annual instructor training, tuition-assistance grants, and marketing and equipment materials.</p>	<p>Staff or contractor time for coordination, plus equipment and material assistance:</p> <p>\$50,000/year.</p>

Encouragement Initiatives



Project Name	Background Information	Cost Assumptions
	<p>Bicycle parking is one of the most basic but often over-looked amenities for bicyclists. Charlotte's bicycle parking ordinance ensures that new development provides appropriate bicycle parking, but there is a significant need for bicycle racks as part of existing development or within the city's right-of-way. The Charlotte Bicycle Program will purchase and install inverted-U bicycle racks at various locations within the right-of-way, as part of bicycle parking corrals, or at private businesses where the owner/property manager agrees to install and maintain the rack for a period of five years.</p>	<p>Twenty racks per year at \$500 per rack for purchase and installation: \$10,000 per year.</p>
	<p>Charlotte has produced three editions of the Charlotte Cycling Guide, with the latest edition being in 2015. This guide provides a map of existing bicycle facilities, as well as suggested bicycle routes to help bicyclists navigate through Charlotte. The guide also illustrates some of the basic skills for bicycling on a city's streets. The Charlotte Cycling Guide requires frequent updating due to the popularity of the maps and the ongoing change in street/bicycle network in Charlotte.</p>	<p>\$30,000 for map production and printing every three years: \$10,000 per year.</p>
	<p>The City of Charlotte sponsors Bike! Charlotte, a two-week long series of promotional bicycle events in May. Individual events organized by private and non-profit partners are marketed under the Bike! Charlotte theme, and are aimed at encouraging residents to explore Charlotte. Funding will be used for event marketing and production, and includes significant outreach to individual event organizers.</p>	<p>Contract for event marketing, coordination and production: \$30,000 per year</p>
<p>Bicycle Program Ambassadors</p>	<p>This initiative allows the city's bicycle program to conduct outreach efforts to communicate the city's vision and efforts towards becoming a bicycle friendly city. Staff will attend numerous community events throughout the year for the purposes of bicycle education and promotion. Staff or contractors will also be available as trained bicycle ambassadors, able to mentor residents about how to navigate Charlotte and conduct typical transportation trips.</p>	<p>Staff or contractor time, plus materials and marketing: \$50,000 per year.</p>




Enforcement Initiatives



Project Name	Background Information	Cost Assumptions
Enforcement Activities	<p>The Charlotte Bicycle Program would partner with the Charlotte-Mecklenburg Police Department (CMPD) for efforts that increase the safety of bicyclists. This initiative would include targeted enforcement events addressing illegal and unsafe driving behaviors such as “texting while driving”, “speeding on designed bicycle corridors”, and “failure to yield at path crossings”. The precedent for these targeted enforcement campaigns was set as a part of the recent <i>Watch 4 Me NC</i> campaign, where CMPD conducted ten enforcement events throughout 2015 with a focus on improving pedestrian, bicyclist, and motorist safety. The initiative would also include providing bicycle lights and/or children’s bicycle helmets for CMPD to distribute through community events, community policing activities and as part of education and enforcement initiatives.</p>	<p>Two enforcement events per year at \$5,000 each for staff coordination, CMPD staff time, materials and corresponding awareness/media campaign:</p> <p>\$10,000 per year.</p>

Evaluation and Planning Initiatives



Project Name	Background Information	Cost Assumptions
<p>Bicycle Counts</p>	<p>One of the greatest challenges facing bicycle planning is the lack of documentation on usage and demand. Without accurate data, it is difficult to measure the positive benefits of investments, especially when compared to the robust data collected for motor vehicles. This funding would allow the city to install additional bicycle/pedestrian counters to supplement the eighteen counters in ten different locations installed through a recent partnership with the NCDOT. A total of 36 potential locations were identified through the work with ITRE and NCDOT, and additional potential locations will be nominated in conjunction with bikeway projects.</p>	<p>Two dedicated bicycle/pedestrian counters installed per year at \$10,000 per counter for equipment and installation:</p> <p>\$20,000 per year</p>
<p>Demonstration/Pilot Projects</p> 	<p>Demonstration and pilot projects are an opportunity for the city to test potential design treatments and street re-configurations before committing to a full-scale, permanent capital investment. Pilot projects can be used to test the feasibility of cycletrack operations, lane-reductions or place-making projects that improve conditions for bicyclists and neighborhood residents. This initiative would fund the staff time required to design, implement and gather feedback on a pilot project, plus any necessary materials for implementation.</p>	<p>Staff time, outreach, materials and installation:</p> <p>\$50,000 per year.</p>
<p>Bicycle Planning</p>	<p>One of the core functions of the city’s bicycle program is to represent bicyclists’ interests on the various transportation-related plans, studies, projects and community efforts that occur in the Charlotte region. This initiative recognizes the significant amount of time that is dedicated to involvement in these efforts.</p>	<p>Bicycle program staff time dedicated to bicycle-related planning efforts:</p> <p>\$50,000 per year</p>



APPENDIX A: BIKEWAY FACILITY SELECTION

Bikeway Facility Selection in the Charlotte Context

In some cases the selection of an appropriate bikeway must balance traffic conditions, land use context, and implementation cost.

As a starting point to selecting the preferred bikeway facility type for a given roadway, *Figure 1* (on the following page) can be used to determine the recommended type of bikeway to be provided in particular roadway speed and volume situations. To use this chart, identify the appropriate daily traffic volume and travel speed on the existing or proposed roadway, and locate the facility type(s) indicated by those key variables.

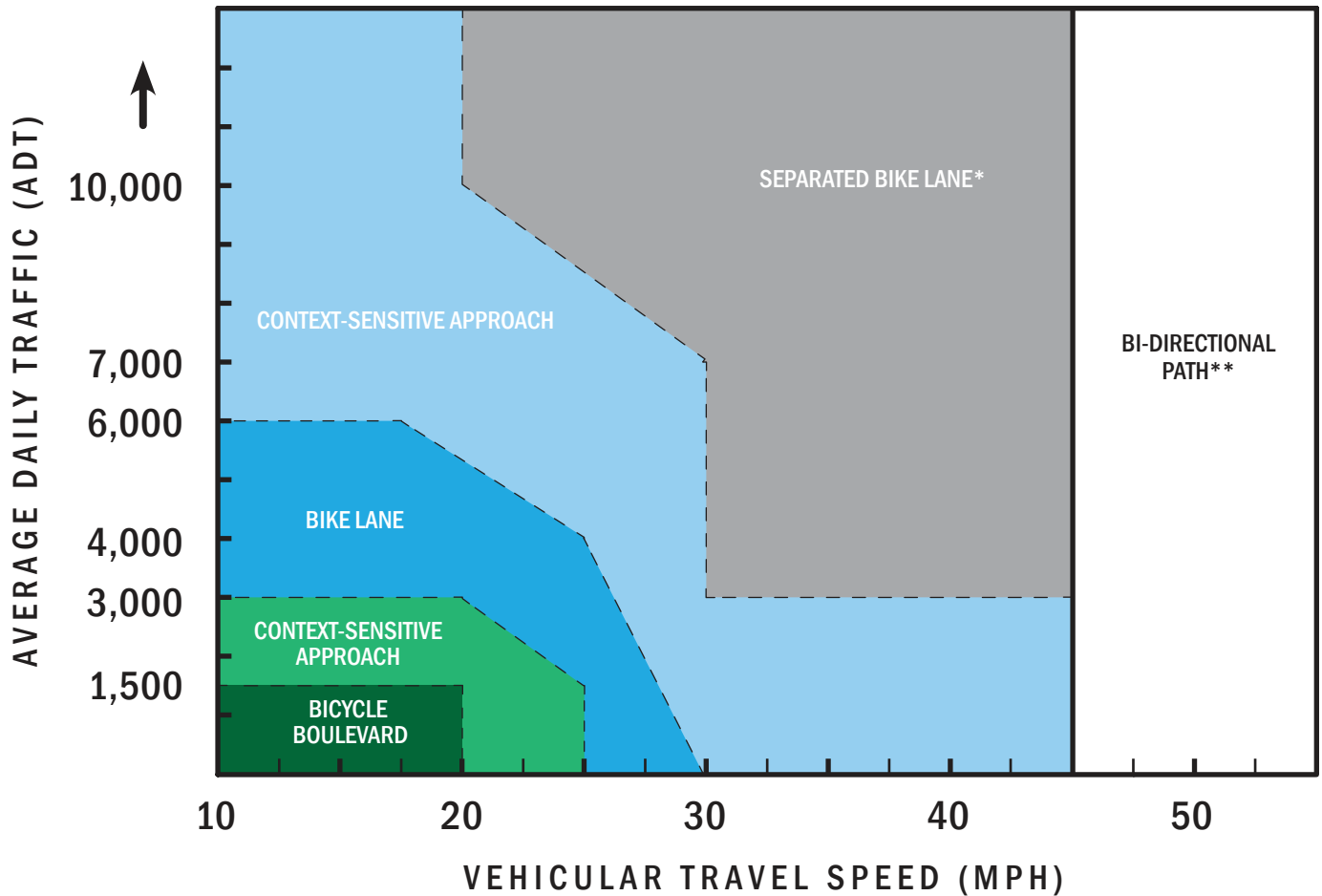
Other factors beyond speed and volume which may alter the preferred facility selection include:







- traffic mix of automobiles and heavy vehicles,
- the presence of on-street parking,
- available roadway or roadside space,
- intersection and driveway density, and
- surrounding land uses and expected pedestrian volumes.

Once the preferred facility type is identified, the reference tables on the following pages provide high-level summary information regarding the design, implementation and design considerations related to each facility type.



Figure 1: Bicycle Facility Implementation Guide



-  These speeds are generally inappropriate in an urban setting, and a path may be a viable facility type.
-  A separated bike lane facility is appropriate in this speed and volume range
-  A bike lane may function here, but additional separation is preferred. Consider providing additional width in the form of a painted buffer or physical separation.
-  A bike lane facility is appropriate in this speed and volume range
-  A bicycle boulevard may function here, but consider additional traffic calming and access management in order to improve conditions.
-  A bicycle boulevard may function here, but consider additional traffic calming and access management in order to improve conditions.

*** SEPARATED BIKE LANE**

One-way directional separated bicycle facilities are preferred over two-way cycletracks under most circumstances.

Bidirectional (two-way) separated bike lanes may be considered on one-way streets, where operational challenges can most easily be addressed. On two-way streets, bidirectional separated bike lanes are generally inappropriate, but may be considered for short segments to fill a gap or complete a critical connection. Long segments of bidirectional separated bike lanes may be appropriate on streets with few intersections or driveways, such as along rivers or parks.

**** BI-DIRECTIONAL PATH**

Shared-use paths adjacent to a road (“sidepaths”) are generally only appropriate in limited-access types of road corridors.

Shared-use paths are generally inappropriate in an environment with expectation for high pedestrian volumes or in an environment with frequent street and driveway spacing. The preferred access spacing to safely accommodate shared-use paths is recommended at 880’ or greater for street intersections and 440’ or greater for driveways.



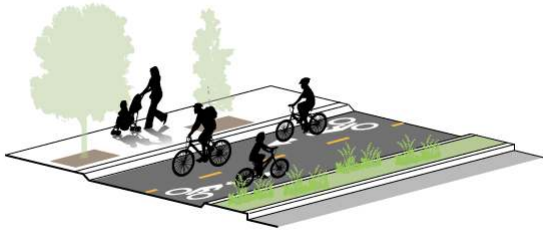
BI-DIRECTIONAL PATH

Non-motorized pathway in an independent right of way or parallel to a roadway.



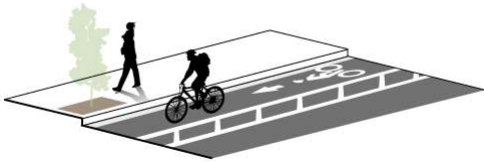
ONE-WAY SEPARATED BIKE LANE

Physically separated bike lanes. Also known as a cycle track or protected bike lane.



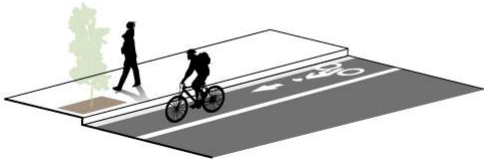
TWO-WAY SEPARATED BIKE LANE

Physically separated bike lanes designed for bi-directional use.



BUFFERED BIKE LANE

On-street bike lanes paired with a designated buffer space.



ON-STREET BIKE LANE

On-street bike lanes designate an exclusive space for bicyclists through the use of pavement markings and signage.



BICYCLE BOULEVARD

Bicycle boulevards are low-volume, low-speed streets designed to prioritize bicyclist travel and discourage motor vehicle travel along the route and across intersections. Also known as “neighborhood greenways,” “quiet streets,” etc.



SHARED ROADWAY

Shared roadways (which may be designated bike routes) are roadways without dedicated bicycle facilities. Shared Lane Markings (SLM) may be included.



Sources

The AASHTO Bike Guide states that bicycle boulevard volumes should be “generally less than 3,000 vehicles per day.” (p. 2-19) Guidance for volumes on shared roadways are even stricter, and should be “generally less than 1,000 vehicles per day” (p. 2-17).

In shared roadway conditions, the AASHTO Bike Guide states that vehicle speeds should be set “where the speed differential between motorists and bicyclists is typically 15 mph or less.” (p. 2-19). Casual bicyclists may travel as slow as 8 mph (AASHTO Bike Guide p. 2-5), resulting in a maximum motor vehicle speed of 23 mph and an appropriate speed limit of 20 mph.

As speeds and volumes increase, so does the desire for user separation. The AASHTO Bike Guide states that bicycle lanes are appropriate on “any road where the design speed is more than 25 mph” (p. 2-19). Between 3,000 and 6,000 ADT, the MUTCD encourages lane delineation in the form of center lines and edge lines (Sec. 3B.01). Delineation of bicycle lanes is also appropriate in this volume range.

The AASHTO Bike Guide recommends physical separation such as paths on roadways with “very high motor vehicle volumes such that bicyclists might be discouraged from riding on the roadway.” (p. 2-20). Beyond 10,000 ADT, roadways become congested and stressful. AASHTO Green Book defines high-speed as greater than 45 mph, and also states that “Reconstructed urban arterial highways should generally be designed for an operating speed of at least 50 km/h [30 mph].” p2-58. At these arterial roadway volumes and speeds, physical separation is desired.

NCHRP Report 766: Recommended Bicycle Lane Widths for Various Roadway Characteristics (2014) describes characteristics which impact bicycle positioning, and where buffers may be beneficial for influencing safety.

Bicycle Facility Selection: A Comparison of Approaches (2002) by Michael King, Andy Clarke, and Charles Zegeer, evaluates bicycle facility selection guidelines from a variety of published national, state, and local design manuals, in order to determine whether global consensus exists that could lead toward establishing minimum standards.

