Indian Trail Bicycle Master Plan

Adopted by:
Town of Indian Trail and Town Council

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Submitted by:

HNTB

In conjunction with:

Division of Bicycle & Pedestrian Transportation
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Walkable & Livable Communities Institute Inc.
Donal Simpson

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The development of the Indian Trail Bicycle Master Plan would not have been possible without the dedication and support of several individuals. These individuals include the Bicycle Master Plan Steering Committee, members of the Town Council and Planning Board, Town staff, the North Carolina Department of Transportation (NCDOT) and the citizens of Indian Trail.

Steering Committee Members

Patricia Cowan

Robert Rollins

John Barnard

Shelley Chryst

Ash Minor

Linda Hall

Wayne Bell

Dave Anderson

Debbie Mollison

Scott Cole

Town Staff

Joe Fivas, Town Manager

Shelley DeHart, AICP, Planning Director

Hillary Pace, Environmental Planner, Project Manager

Craig Thomas, Junior Planner, Project Manager

Adam McLamb, Civil Engineer I

Luke Fawcett, GIS Director

North Carolina Department of Transportation

Bob Mosher, ASLA, AICP, Planning Program Manager

Scott Cole, PE

Consultants

HNTB Corporation

Kevin Walsh, LEED AP, Project Manager

Padam Singh, AICP, LEED AP

Paige Hunter, E.I.

Walkable and Livable Communities, Inc.

Dan Burden

Sarah Bowman

Independent Consultant

Donal Simpson, AICP, FAIA

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Executive Summary

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Executive Summary

ES1.1 Overview

The Town of Indian Trail has undergone significant changes in recent years, as residents, businesses and developers have been drawn to its small-town charm and convenient location near the Charlotte metropolitan area. The Town is quickly transitioning from a rural farming community to a vibrant suburban community in one of the fastest growing counties in the United States. Due to this tremendous growth, the Town has been faced with many challenges, such as incorporating bicycle facilities into the roadway network. Most of the major roads within Indian Trail are two lane facilities with no shoulders and drainage ditches on either side. The Town has been and continues to be committed to improving pedestrian and bicycle mobility throughout the community.

ES1.2 Benefits of Bicycling

The vision of the Comprehensive Plan states that "Indian Trail should be a vibrant and self-sufficient town with a unique identity. With a focus on downtown and its connections to surrounding neighborhoods and commercial areas. Indian Trail can be a place where people live, work and play in a safe environment." A multi-modal transportation network in concert with diverse land uses can achieve this vision. Indian Trail can be a place to work, live and play. It can also be a place where people want a better quality of life that includes multiple benefits. These benefits include, but are not limited to the following:

- Health Benefits
- Transportation Benefits
- Environmental Benefits
- Economic Benefits, and
- Quality of Life Benefits

ES1.3 The Process

The adoption of the Bicycle Master Plan is more than just an important step in ensuring the implementation of the Vision set forth in the Comprehensive Plan, but also improving connectivity and bicycle mobility for the community. This Plan establishes a vision for improving bicycle infrastructure over the next 20 years; however, the Plan will need to be assessed and updated on a regular basis to address the changing needs of the community.

The Bicycle Master Plan seeks to identify the users of the future bicycle network, their needs and the best way to serve those needs. This Plan was

developed over a 12 month process and included a variety of public outreach methods including Steering Committee meetings, Stakeholder Interviews, Public Workshops, Bike Rodeos, Visual Surveys, a Bicycle Audit, the use of Facebook, and an online survey. The public involvement process engaged a wide cross-section of the community, including many children who participated in the bicycle rodeos and visuals surveys. This Plan provides a foundation of bicycle infrastructure improvements as well as bicycle safety and education initiatives that the community identified as critical components to improving bicycle mobility and safety.

ES1.4 Vision and Goals

The input received from the initial public workshop, the stakeholder interviews, meetings with the Steering Committee, discussions with the Town staff and results from the questionnaire led to the development of a vision statement and key goals. The vision statement and the goals from this plan, along with the vision and goals identified in previous plans, have guided the development of the Bicycle Master Plan and will continue to do so once the plan is adopted.

BICYCLE MASTER PLAN VISION

"To promote a bicycle-friendly environment within Indian Trail by improving connectivity between neighborhoods and destinations; where multi-use paths, greenways and bicycle facilities are further developed and integrated, and all users are provided safe and convenient access."

"Indian Trail will work to forge partnerships, educate the community, and design facilities that are safe and pleasing."

ES1.4.1 Bicycle Master Plan Goals

The following are the goals that were developed during the process in order to achieve the vision statement. The goals listed below mirror the goals that were identified in the Comprehensive Plan. These goals, like the vision statement, will continue to guide the implementation of the Bicycle Master Plan.

- Future bicycle facilities should be planned and designed with all users in mind
- Future bicycle facilities should be accessible for everyone
- Improve bicycle connectivity between existing and future residential subdivisions, schools, and other destinations throughout town.

- Bicycle facilities that are built be should safe, accessible, inviting and aesthetically pleasing
- The Town should develop programs that educate motorists and bicyclists
- Improve bicycle safety on existing roads
- Plan and design facilities for both recreational and transportation users
- Incorporate bicycle facilities into future roadway projects
- Educate the children on the importance of health, safety, and the use of bicycle facilities
- Indian Trail's future bicycle infrastructure should connect to surrounding communities and their bicycle facilities
- Bicycling has to be an important priority for the community
- The development of partnerships will be critical for the success of this plan
- The Town should work with NCDOT to reduce automobile speeds on roadways
- Future bicycle facilities need to connect to Downtown

ES1.5 Community Concerns, Needs & Priorities

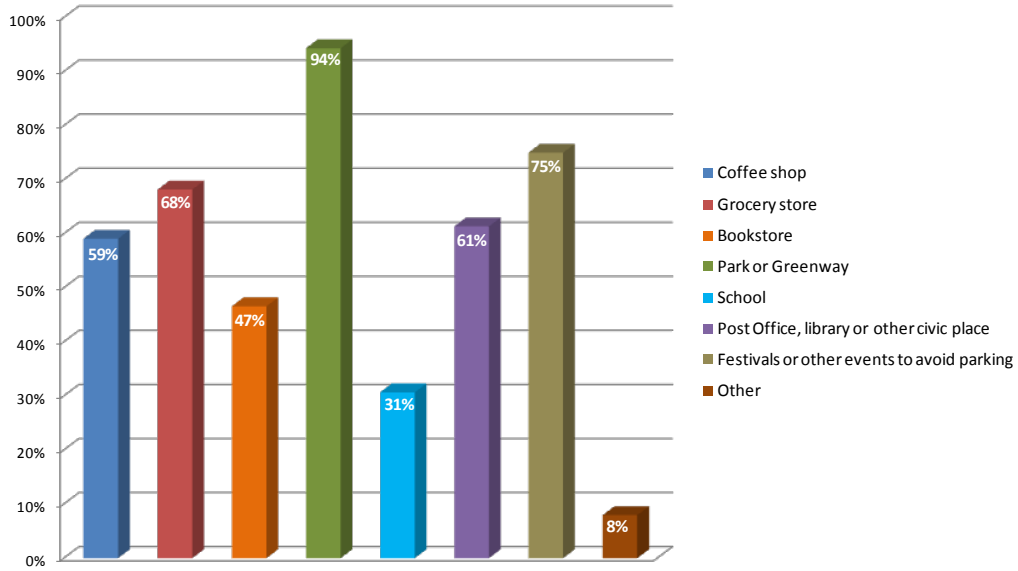
The public input process led to an understanding of the needs and concerns of the community regarding bicycle mobility and safety. This information was essential for developing recommendations that respond to the residents' needs and concerns, and to generate public enthusiasm and interest for the implementation of the plan. The main concerns that were expressed are summarized below.

- The current transportation network is not safe for bicyclists
- There is a lack of connectivity between existing subdivisions, schools and other destinations around town
- Future bicycle facilities should be designed to be accessible for all users
- Educational programs are needed for both drivers and bicyclists
- There are major barriers, such as US 74 and CSX railroad, that impede bicycle mobility throughout the town
- Indian Trail's future bicycle network should connect to adjacent jurisdictions

- Future parks should include off-road bicycle trails
- The high traffic volumes and speeds on the thoroughfares is an impediment to cycling

ES1.5.1 User Groups and Trip Characteristics

To develop an effective and usable bicycle system, it is important to identify the different user groups and the types of facilities they prefer. As mentioned later in the report in Chapter 2, there are three basic types of user groups: Advanced, Basic and Children. A large percent of the general population falls within the basic and children user groups. These users tend to enjoy riding for recreation purposes and use greenways or neighborhood streets to get around. The advanced cyclist tends to ride for exercise or commuting purposes. It is also important to understand the purpose of their trips. An online questionnaire was utilized to compile this information and was useful in determining the types of users and their purpose of bicycling. The questionnaire provided insight to the



places people currently cycle and where they would cycle to if there were sufficient bicycle facilities. Most of the respondents (94%) said that they would bicycle to parks or greenways if there were sufficient facilities. Even though this may not be a complete representation of the community, it still provides some valuable information to help identify the types of user groups within Indian Trail.

ES1.6 Existing Bicycle System

Although the Town is working on their initial defined bike routes, there are several small segments of a multi-use path along US 74. These segments have been built due to new requirements that are detailed in the Town's Unified Development Ordinance (UDO), which is a testament to the Town's commitment to increasing pedestrian and bicycle mobility throughout the town. Currently there is approximately 2600 linear feet (almost a ½-mile) of existing multi-use path along US 74 within Indian Trail. In addition, many residential subdivisions have private trails that are for the residents who live within those communities.

Based on the feedback from the community and physical inventory of the existing transportation network, it is evident that there are many barriers and gaps that have to be overcome to create a safe bicycling environment within Indian Trail. However, the Town continues to be proactive and work with state agencies and surrounding municipalities to develop projects and programs that will one day result in a comprehensive transportation network that includes facilities for bicyclists.

ES1.7 Existing Programs, Plans and Policies

The success of the Bicycle Plan cannot be realized with just physical improvements. Strong programs and policies need to accompany those physical improvements to educate and inform the community about bicycle safety and how to use the facilities. There are many plans, programs and policies that exist today that will contribute to the success of the Bicycle Master Plan. Many of these have already helped lay the groundwork for a successful bicycle program in Indian Trail and will continue to do so in the future.

More specifically, the Town has taken great strides in improving their Unified Development Ordinance (UDO) over the last five years to include measures that will ensure bicyclists are safe; that infrastructure is built in the future; and the infrastructure is connected and coordinated in a comprehensive manner. A detailed summary of these can be found in Chapter 3.

ES1.8 The Bicycle System

A comprehensive bicycle system will create improved connectivity throughout the town and provide residents and visitors with transportation options not currently available. The Bicycle System (Figure E.1) was developed by reviewing the Town's previous planning efforts, inventorying existing bicycle facilities and gathering input from the public through stakeholder interviews, public workshops and an online survey. One of the major goals of this plan was to

create a bicycle system that provides connections to various destinations throughout the town, which includes the Town's Village Centers. The Village Centers are intended to be pedestrian and bicycle friendly with an improved network of sidewalks and bicycle facilities, including bike lanes and multi-use paths.

Today, the existing major thoroughfares within Indian Trail are not suitable for bicycle travel. Most of the major thoroughfares are two lane roads that have no usable shoulder and contain drainage ditches on both sides. Due to the lack of bicycle facilities throughout the town and funding to improve these roads, alternatives to create connectivity had to be explored. Discussions with the Steering Committee, Town staff, stakeholders and the public led to the creation of Neighborhood Loops, Town-Wide Connectors and Neighborhood Connectors.

- Neighborhood Loops – Primarily use existing and future neighborhood streets to connect users to destinations. There are 19 neighborhood loops totaling approximately 45 miles.
- Town-Wide Connectors – Is a system of longer connections that utilize existing major thoroughfares, overhead transmission lines, railroad corridors and sewer easements. There are a total of 12 town-wide connectors, equaling approximately 55 miles.
- Neighborhood Connectors – Currently these are informal connections that exist between subdivisions through off-road connectors. These links can be formalized by creating short paved trails that provide a safe connection between two neighborhoods. There are a total of 7 neighborhood connectors, two of which are listed as pilot projects that are discussed in more detail in Chapter 6.

ES1.9 Plan Implementation

ES1.9.1 Project Prioritization

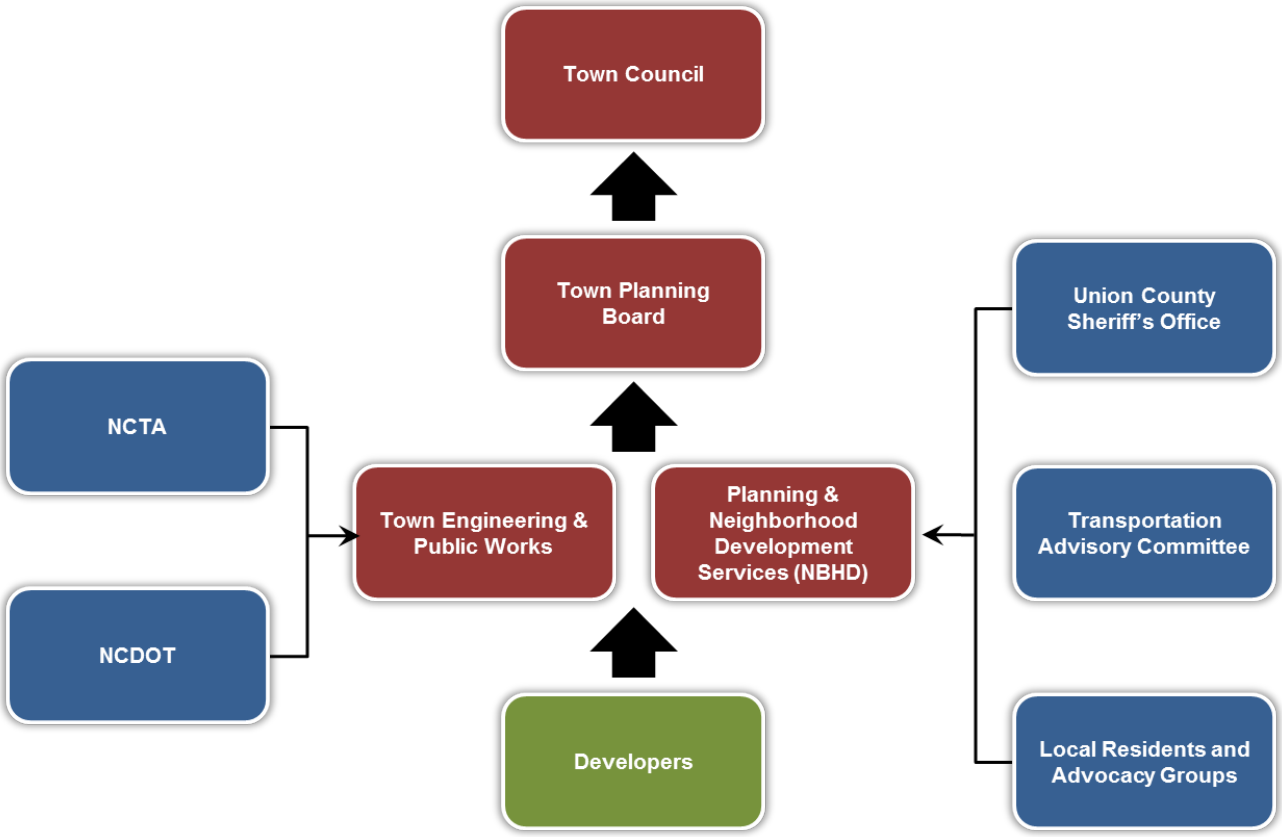
Based on the feedback from discussions with the Steering Committee, Town staff, stakeholders and the public, a total of approximately 120 bicycle improvement projects were identified. It is important for the Town to have some implementation strategies and timeframes for construction to help guide the decision making process. A detailed explanation of this prioritization process can be found in Chapter 6.

Once the projects were prioritized they were organized into the Bicycle Matrix, which is located in Appendix C. The Bicycle Matrix should be used by the Town to assist in monitoring the actual implementation of the projects. The list of projects in the Bicycle Matrix should be updated periodically to include new projects as they are discovered and others are completed.

To maintain the momentum from this Plan, four Pilot Projects were chosen to illustrate the commitment of the Town to improve bicycle mobility, and to serve as a precedent for future projects. The Town should focus on implementing these pilot projects over the next three years. A full description of the pilot projects is located at the end of Chapter 6.

The successful implementation of the Bicycle Master Plan can only be realized through the collaboration of various partners. These partners are illustrated in the Responsibilities Framework graphic provided below. Each of these partners will have a specific role in the implementation of the plan. Details regarding the roles and responsibilities of each can be found in Chapter 6.

Responsibilities Framework



ES1.9.2 Implementation Matrix

To provide guidance the implementation of the recommendations in this Plan, an Implementation Matrix was developed (see Appendix E).This Matrix provides a series of action steps or tasks associated with the implementation of this plan. These action steps have been organized by the following categories:

- Planning
- Funding
- Construction
- Maintenance
- Education
- Coordination

Under each category are tasks that are critical to the implementation of the recommendations in this plan. These tasks have been assigned implementation timeframes including: Immediate (1-3 years), Short-Term (3-5 years), Mid-Term (5-10 years), and Long-Term (over 10 years).

ES1.10 Next Steps

The adoption of the Bicycle Master Plan will initiate the implementation of this Plan and the recommendations outlined throughout. This plan was developed with significant input and support from the community, and the Town should ensure that ongoing communication is achieved and updates are provided to the citizens of Indian Trail.

This plan has provided a foundation of projects and programs that the Town will be implementing over the next several decades. The Town should continually assess the effectiveness of the programs and policies as well as update the Bicycle Matrix as projects are completed and new ones are identified.

There are several strategic implementation action items from the Implementation Matrix in Appendix E that the Town should begin working on once this plan is adopted. These items are listed as immediate priority in the matrix and are listed in Table E.1 on the next page. The Town should begin implementing these items over the next 1-3 years.

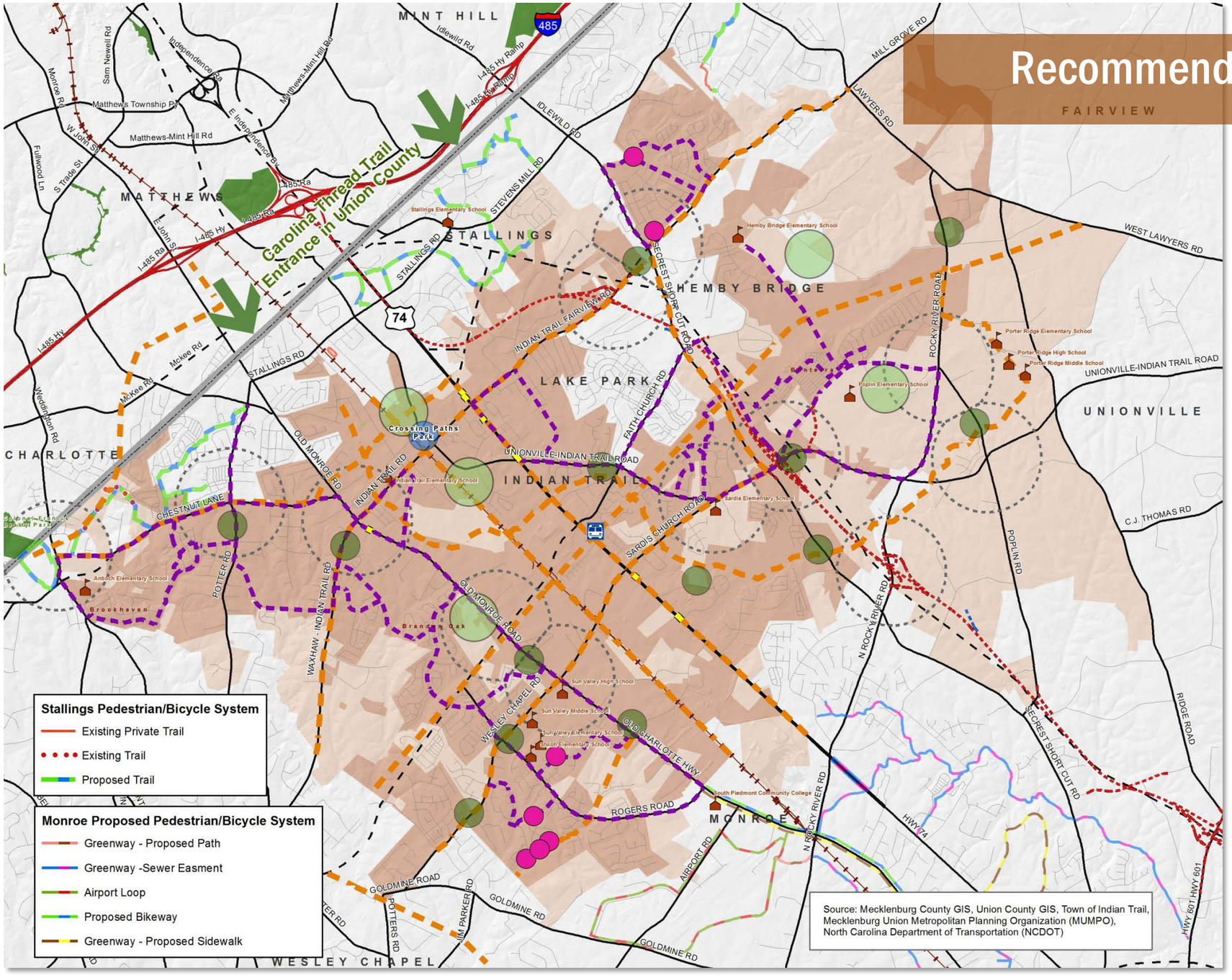
Table E.1 Strategic Implementation Actions

Action Item
Planning
Adopt the Bicycle Master Plan
Implement Pilot Projects through further planning and design
Draft a Resurfacing and Restriping Policy that requires the consideration of bicycle facilities (bike lanes, wide shoulders, etc.)
Approve new Resurfacing and Restriping Policy
Incorporate Facility Standards and Guideline (Chapter 5) into the Town's Development Standards
Add definitions of bicycle facilities to the Town's Unified Development Ordinance
Hire an employee to initiate the Town's Parks and Recreation Department
Add bicycle facility standards to the Town's Development Standards
Meet with Transportation Advisory Committee to review the Bicycle Master Plan and their involvement in the implementation of the plan
Funding
Pursue Safe Routes to School grants for programs and policies
Pursue Safe Routes to School grants for the construction of the pilot projects
Develop a long-term funding strategy (General Fund, Powell Bill Funds, etc) for the development of bicycle facilities

Table E.1 Strategic Implementation Actions (continued)

Action Item
Construction
Initiate Neighborhood Signed Route installation
Construct Pilot Projects
Maintenance
Incorporate bicycle maintenance into the Town's maintenance program
Education/Encouragement
Develop communication program to educate the community about the Bicycle Plan
Construction
Initiate communication with surrounding municipalities to discuss bicycle related issues and to coordinate on adjacent bicycle projects
Initiate discussions with local and regional health organizations to educate community about benefits of bicycling.

Figure E.1:
Recommended Bicycle System Map



Stallings Pedestrian/Bicycle System
- Existing Private Trail
- Existing Trail
- Proposed Trail

Monroe Proposed Pedestrian/Bicycle System
- Greenway - Proposed Path
- Greenway -Sewer Easment
- Airport Loop
- Proposed Bikeway
- Greenway - Proposed Sidewalk

Source: Mecklenburg County GIS, Union County GIS, Town of Indian Trail, Mecklenburg Union Metropolitan Planning Organization (MUMPO), North Carolina Department of Transportation (NCDOT)

Legend
- Schools
- CATS Park & Ride
- Existing Multiuse Path
- Proposed Neighborhood Connector
- Proposed Neighborhood Loop
- Proposed Townwide Connector
- Existing Crossing Paths Park
- Proposed Indian Trail Neighborhood Parks
- Proposed Indian Trail Community Parks
- Future Monroe Bypass
- Future Monroe Bypass Service Roads
- Interstates
- MUMPO Thoroughfare (Existing)
- MUMPO Thoroughfare (Proposed)
- Union County Roads
- Railroads
- Mecklenburg County Parks
- Village Center Overlay
- County Boundary
- Indian Trail
- Planning Area

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CHAPTER 1

Introduction

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Indian Trail Bicycle Master Plan

Chapter 1:
Introduction

1.1 Context

The Town of Indian Trail has rapidly grown over the past 20 years, and is quickly transitioning from a rural farming community to a vibrant suburban community in one of the fastest growing counties in the United States. Due to this tremendous growth, the Town has been faced with many challenges, such as incorporating bicycle facilities into the roadway network. Many of the roadways within Indian Trail developed as farm-to-market roads, providing farmers the ability to transport their crops to the markets within the region. Many of these roads still exist today, and unfortunately for the residents that call Indian Trail home, the characteristics of those roads have not changed since they were built. Most of the major roads within Indian Trail contain two narrow travel lanes, no shoulders and drainage ditches.

Farm-to-Market Roads in Indian Trail

According to the State of North Carolina Office of State Budget and Management, in 2000, the population of Indian Trail was 11,749. In comparison, the estimated population in 2009 was 27,524, more than double of that in 2000[1]. A percentage of this population does not have a driver's license, and although this percent is not known for Indian Trail, a quick look at North Carolina statistics suggest that roughly 30% of town residents may not have legal permission to drive a vehicle.[2]

This signifies a growing concern among many jurisdictions, that the number of people who depend on alternative modes of transportation is large and growing. This concern is even higher in growing suburban communities such as the Town of Indian Trail, where access to public transit is limited (for local travel) and recent development of residential subdivisions and commercial shopping centers are only connected via a network of rural thoroughfares. The Town has been and continues to be committed to improving pedestrian and bicycle mobility throughout the community. The following section of this chapter provides an overview of those efforts and explains how they will work in concert with the Bicycle Master Plan to create a safe, convenient and accessible bicycle infrastructure.

1.2 Previous Plan

1.2.1 The Comprehensive Plan (adopted 2005)

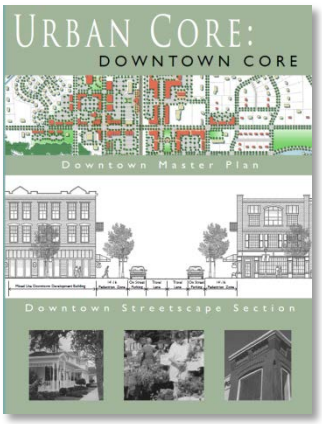
Over the past 5 years, the Town has taken significant steps to address the rapid growth and lack of pedestrian and bicycle infrastructure. In 2005, the Town adopted its first ever Comprehensive Plan, which provided recommendations for future growth and transportation network. One of the primary goals of the Comprehensive Plan was to focus higher density development within Village Centers and to build the infrastructure within and around the Village Centers that would allow residents to walk or bike to their destinations easily. The improved infrastructure includes sidewalks and bike lanes and will provide multi-modal transportation options for users in the future (see Appendix A: Proposed Roadway Network). The following table provides an overview of the Proposed Roadway Network and the types of pedestrian and bicycle facilities that were incorporated into each facility type.

Facility Type	# of Travel Lanes	Sidewalk Width (ft)	Bike Lane Width (ft)
2-Lane Thoroughfare	2	6	NA
4-Lane Village Center	4	10 (multiuse path)	4
2-Lane Boulevard	2	6	4
4-Lane Thoroughfare	4	5	NA
4-Lane Boulevard	4	6	4
6-Lane Boulevard	6	10 (multiuse path)	NA

As the table indicates, most of the proposed road typologies included a minimum 5-foot sidewalk and all except thoroughfares require 4-foot bike lanes. To see the cross-sections for each road typology from the Comprehensive Plan, please see Appendix A: Proposed Roadway Network. The 6-lane Boulevard, which is only identified for US 74, recommends combining pedestrian and bicycle travel on a 10-foot multi-use path. This recommendation was developed to provide a safe facility for both pedestrians and cyclists to utilize along the US 74 Corridor. The Comprehensive Plan identified a multi-use path along US 74 and is intended to keep bicyclists off of the busy and dangerous US 74 corridor and to create a continuous multi-use path along the highway. The Town's Unified Development Ordinance now requires that new developments build a 10-foot wide multi-use path along US 74 and a 10-foot

wide pedestrian zone with a 4-foot bike lane within the Village Centers. In the future, as the Town continues to grow and existing roads are rebuilt and new ones are created, the Town will be connected with a comprehensive multimodal transportation system.

In addition to the Proposed Roadway Network, the Comprehensive Plan proposed a network of greenways to primarily follow existing creeks and floodplains throughout the town. The greenway system supplements the roadway network by providing alternative connections to the Village Centers and other destinations throughout the town.



1.2.2 Downtown Master Plan (adopted 2006)

After the completion of the Comprehensive Plan, the Town began the process to develop a downtown master plan. The Downtown Master Plan also recognized the need for an improved street network that would promote interconnected streets making it easier for and enable individuals to walk and bike throughout downtown.

The Plan recommends the consolidation or combination of driveways, which will reduce the amount of conflict points for bicyclists within the downtown area. In the future, this will help reduce potential bicycle crashes in downtown as it builds out.

1.2.3 Pedestrian Master Plan (adopted 2009)

In 2007 the Town of Indian Trail was awarded a Pedestrian Grant through the North Carolina Department of Transportation (NCDOT). As a result, the Town developed a Pedestrian Master Plan, which was adopted in January of 2009. The Pedestrian Plan provides recommendations for improving the pedestrian network town-wide, which includes greenways and off-road connectors. The Pedestrian Plan expanded upon the proposed greenways from the Comprehensive Plan to connect the existing residential subdivisions to various destinations throughout the town, including schools, downtown, and adjacent communities' pedestrian and bicycle systems. To ensure future pedestrian facilities connected with adjacent communities, the Pedestrian Plan incorporated the existing and proposed pedestrian and bicycle facilities from the Town of Stallings and the City of Monroe.

The proposed greenways and off-road connectors will provide residents with short connections that will allow them to walk or bike to destinations that are within close proximity to their homes. The Bicycle Master Plan will utilize the information from the Pedestrian Master Plan and expand on the greenway and off-road connectors to improve connectivity for all users.

1.2.4 Park and Greenway Master Plan (adopted 2010)

The Park and Greenway Master Plan identified the need for 14 neighborhood parks, 5 community parks, and a system of greenways to provide a system of parks and greenways that would fulfill the recreational needs of the community. The Park and Greenways Master Plan used and expanded upon the proposed greenways from the Comprehensive Plan and the Pedestrian Master Plan. One of the major goals from the Park and Greenway Plan was to identify locations where future parks could be located and to ensure that they were connected with the proposed greenway system, the Village Centers identified in the Comprehensive Plan and existing and planned residential subdivisions. The comprehensive greenway network will allow bicyclists and other users to reach future parks, the Village Centers and other destinations without having to travel on the roadway system.

1.3 Benefits of Bicycling

The vision of the Comprehensive Plan states that "Indian Trail should be a vibrant and self-sufficient town with a unique identity. With a focus on downtown and its connections to surrounding neighborhoods and commercial areas. Indian Trail can be a place where people live, work and play in a safe environment." A multi-modal transportation network in concert with diverse land uses can achieve this vision. Indian Trail can be a place to work, live and play. It can also be a place where people want a better quality of life that includes multiple benefits. A community that has well planned and designed bicycle facilities can experience these benefits of bicycling. These benefits include, Health Benefits, Transportation, Environmental, Economic and Quality of Life. Bicycling, whether it's for recreational purposes or transportation, span across many aspects of our lives. The following section of this chapter provides an overview of the five main benefits of bicycling.

Source: www.pedbikeimages.org/

1.3.1 Health Benefits

The issue of physical activity has never been more important than it is today. Research by the Center for Disease Control has shown that an alarming number of Americans are becoming more inactive and obese, consequently putting their lives at risk. In 2007-2008, the prevalence of obesity was 32% among adult men and 36% among adult women.[3] Engaging in light to moderate physical activity reduces the risk of heart disease, stroke, and other chronic illnesses. Physical activity has also shown to improve an individual's mental health and can even lower health care costs.[4]

Therefore, developing a comprehensive system of bicycle facilities, within Indian Trail will help increase the overall health of the community and will provide individuals with alternative transportation choices. For more information regarding the health benefits of bicycling, please go to the U.S. Department of Transportation Federal Highway Administration's web page at: http://www.fhwa.dot.gov/environment/ bikeped/benefits_research.htm.

1.3.2 Transportation Benefits

Bikeways are an essential part of a comprehensive transportation system, offering connectivity between origins and destinations such as subdivisions, downtown, schools, parks and shopping centers. Bicycling can help reduce roadway congestion by providing an alternative to using an automobile especially for short errands. In fact many of the routine trips that Americans make each day are short enough to be accomplished by riding a bike.[5] The improved transportation infrastructure within the Town's Village Centers will provide individuals with an alternative to driving to their daily destinations. This will help eliminate the number of motorists trying to reach daily destinations that are within close proximity to their homes. The 2001 National Household Travel Survey found that approximately 40% of all trips are less than two miles in length, which represents about a 10-minute bike ride.[6] Therefore, if the transportation network builds out as the Comprehensive Plan recommends, individuals will be able to travel within Village Centers by bike. It is also important to consider the percentage of people that do not have an automobile or are unable to drive. In 2001, the National Household Travel Survey (NHTS) estimated that one in 12 U.S. households did not own an automobile. Also, as mentioned earlier, roughly 20% of Indian Trail's population is between the ages 5-16; which means there's a large portion of the population that does not have a driver's license and could benefit from a transportation system that is built for all users.

1.3.3 Environmental/Energy Benefits

The Environmental Protection Agency (EPA) estimates that motor vehicles are responsible for nearly 80 percent of carbon monoxide and 55 percent of nitrogen oxide emissions in the U.S[7]. The rapid population growth in Indian Trail and areas around the Charlotte metro area have contributed to the increase in air pollution.

The Carolina Heelsplitter is an endangered species and needs to be protected.

In 2004 all of the Mecklenburg-Union Metropolitan Planning Organization (MUMPO) area was part of a multi-county region designation by the EPA as a non-attainment area. This designation can result in the loss of federal funds for transportation projects. Therefore, MUMPO is required by the Federal Government to periodically develop long-range transportation plans. In May 2010, the 2035 Long-Range Transportation Plan (LRTP) was approved. The 2035 LRTP identifies the widening of Indian Trail Road from Old Monroe Road to US 74 as well as many other transportation projects throughout the two county region. These projects in conjunction with programs and policies by the State, MUMPO and local jurisdictions, are aimed at improving air quality. The types of projects that are included in the 2035 LRTP include, but are not limited to, the widening of existing roads, construction of new roads, the development of transit corridors and the development of pedestrian and bicycle improvements, which includes greenways. These types of projects are recommended to reduce congestion on the existing transportation network and provide individuals within the region alternatives to using automobiles. Reducing congestion on the roadway network can help improve the air quality for the region.

In addition to roadway improvements, the development of greenways, bike lanes and other multi-modal facilities can have measurable impacts on air and water quality. Greenways provide significant corridors that provide opportunities for protecting plants and animals species, such as the Carolina Heelsplitter. In addition, greenways improve water quality by creating a natural buffer that protects streams and rivers. Other bicycle facilities, such as bike lanes, can provide opportunities for individuals to bike to nearby destinations, especially those located in the Village Centers.

1.3.4 Economic Benefits

Owning an automobile is expensive, and consumes a large portion of the average American's income. In fact, AAA estimated in 2009 that on average, Americans spend approximately $9,000 towards owning an automobile.[8] In addition to the rising cost of car maintenance and operation, one has to also consider the rising cost of gasoline. According to the U.S. Energy Information Administration, in December 2008 the average cost of a gallon of gasoline was $2 and in December of 2010 it was slightly above $3.[9] From this standpoint, bicycling becomes an even more attractive means of transportation. The rising cost of maintaining an automobile and of fuel prices reinforces the notion that communities should be building infrastructure to promote bicycling. Indian

Trail's Comprehensive Plan identifies Village Centers, where more mixed-use and compact development will be located. This development pattern combined with an improved multi-modal infrastructure will allow residents and visitors the ability to work, live and play within Indian Trail.

Greenways and Trails are some of the most desirable amenities in communities

From a real estate perspective, trails and greenways are considered important amenities that communities want incorporated into their subdivisions. In fact, a 2002 survey by the National Association of Home Builders and the National Association of Realtors showed that walking/jogging trails ranked second out of a choice of 18 community amenities.[10]

Finally, from a tourism perspective, Indian Trail can benefit from having more bicycle facilities in place. Indian Trail already benefits from having regional destinations, such as Extreme Ice, where people come from all over the southeast to use the ice skating facility. In the future, more people will want to move or visit Indian Trail because of the available bicycle amenities.

1.3.5 Quality of Life

One of the goals from the Comprehensive Plan was to sustain a high quality of life. To obtain and sustain a high quality of life, there needs to be a balance of many variables. More and more homebuyers consider a community's livability and the proximity to amenities such as parks and greenways. The number of people bicycling can be a good indicator of a community's livability factor. This can have a huge impact on attracting businesses and workers, as well as tourism[11].

A multi-modal transportation system with good connectivity can provide alternative means of transportation for those individuals who do not have access to a car or do not have a license. These variables, along with others, can work together to achieve the high quality of life that was envisioned with the Comprehensive Plan development. Over time, more people will want to move to Indian Trail, not just to live, but to work and play. An improved transportation network for the Town will allow people to interact more with their neighbors and to bike to parks, schools and other destinations.

1.4 Public Outreach

An extensive public outreach process was developed for the Bicycle Master Plan in order to obtain input from the community. The public outreach process utilized traditional and non-traditional means to collect this information.

The list below represents the various techniques used to gain input throughout the process:

- Steering Committee
- Public Workshops
- Stakeholder Interviews
- Bicycle Audit
- Bicycle Questionnaire (Online via web-based program, Survey Monkey)
- Facebook Group

1.4.1 Steering Committee

The development of the Bicycle Master Plan could not have been realized without the involvement of the Steering Committee. The Steering Committee provided valuable input and feedback throughout the entire process. The committee was composed of a diverse group of individuals that included a Planning Board member, a representative from NCDOT, citizens and avid cyclists. This group of individuals assisted in facilitating public workshops, participated in the bicycle audit, and took time out of their busy schedules to meet with Town staff and the consultant to provide input and feedback on the report. It is recommended that the committee continue to stay involved with the implementation of the plan.

Steering Committee member provide input on bicycle related issues

1.4.2 Public Workshops

Earth Day Arbor Day

The first workshop was conducted during the Town's Earth Day Celebration held at the Town Hall front lawn on Saturday, April 24, 2010. The event had many educational booths, activities, live music, and classes as well as a booth for the Town's Bicycle Master Plan. The Bicycle Master Plan booth provided the public the ability to draw on maps and fill out surveys. Many comments were made regarding the lack of bicycle facilities throughout Indian Trail. There was significant input provided by a Union County Sheriff Deputy who spends significant time on bike patrol in Indian Trail. She mentioned there are

Participants at Earth Day

many off-road opportunities that can connect exiting subdivisions to each other. These types of connections can improve connectivity throughout the town while keeping users off the major thoroughfares. All of these comments were documented and included on the Bicycle Master Plan System Map.

Bicycle Rodeo at Indian Trail's Earth Day Celebration

In addition to the booth, the Union County Sheriff Department conducted a bike rodeo where kids could challenge themselves to the bicycle course and learn some basic laws regarding bicycling, such as how to signal when turning. Also, the Charlotte Area Bicycle Alliance (CABA) set up a tent where they gave away bicycle helmets to children who signed an agreement to always wear a helmet when riding their bike. They taught the children how to correctly wear a helmet and they also provided free bicycle maintenance.

Bike IT Day

The Town hosted a second public workshop, Bike IT Day (Bike Appreciation Day) on October 23, 2010 at Extreme Ice. The event took place between 10am-2pm and was facilitated by Town staff, consulting firm HNTB in conjunction with Dan Burden from Walkable and Livable Communities Institute, Inc. The event provided several opportunities for children and adults to learn more about bicycle safety tips as well as provide feedback on the progress of the Bike Plan. The bike rodeo was used to teach children some basic traffic safety and bike handling skills. The course was set up to mimic several potential hazards or conflicts a cyclist may encounter while riding in the street, such as a pedestrian in a crosswalk, train tracks, riding safely through an intersection, and obeying traffic signs. The skills portion of the course challenged participants to maneuver deftly through traffic cones, and then ride in a straight line while looking over their left shoulder.

Bicycle Rodeo course at Bike IT Day

After successfully completing the riding portion of the activity, each rider then went to the Children's Activity Table where there were a number of bike safety work sheets to test them on their newly acquired knowledge. Before each participant was given a certificate of completion they had to identify the twelve hazards on one of the work sheets.

In addition to the rodeo there was a visual survey that was available for children to participate in during the Bike IT Day events. The survey asked two questions-

where do you like to bike and what places do you bike to. The survey consisted of various pictures of biking facilities and destinations. About 50 children participated in the survey, checking the boxes under the pictures of the preferred bicycle facilities and destinations. Children selected both "friend's house" and "Parks" as the destinations they prefer to ride to and "Bike Lanes" and "Parks" as the bike facilities they prefer to use.

Children participating in the Visual Survey

Bike Safety Education events such as this are a great way to promote awareness of cyclists' rights and responsibilities as road users. Organizing a bike rodeo is a fun and effective means of delivering the message to young people that riding a bike is not only fun but can be dangerous too, if the proper precautions are not taken.

1.4.3 Stakeholder Interviews

In order to gain a better understanding of the issues facing the Town, a series of Stakeholder Interviews were conducted on June 18, 2010. Four different groups were interviewed throughout the day. These groups were comprised of individuals from the following:

- Town Staff Members
- Town Council Members
- County and State Agencies
- Law Enforcement
- Parents
- Town Committee Members
- Resident Bicycle Enthusiasts

Key Issues and Concerns

The following are some of the key issues and concerns that were voiced during the stakeholder interviews.

- The current road network is not safe for bicyclists.
- There is a lack of connectivity between existing subdivisions and schools.
- Future bicycle facilities should be designed to be accessible for all types of users.

- The attitude of drivers is not conducive for safe cycling environment and there needs to be a program that educates both drivers and bicyclists.
- There are major barriers, such as US 74 and CSX railroad, that impede bicycle mobility throughout the town
- The recommended bicycle system should connect adjacent communities and their existing and future bicycle infrastructure
- The Town should ensure that off-road bicycle trails are incorporated into the design of future parks and open space.
- The existing traffic volumes and speeds on the major thoroughfares are very high.

1.4.4 Bicycle Questionnaire

In order to understand the needs of the community, a short questionnaire was developed for the Bicycle Master Plan process and posted online using the web page Survey Monkey. The questionnaire asked general questions about the users age, how often the ride their bike and where they ride it to. The information gathered from the questionnaire provided valuable insight into the community's priorities and bicycling habits. The questionnaire was not a scientific survey and was used to merely gage the attitudes and behaviors of cyclists within the community. Chapter 2 provides a more detailed summary of the results gathered from the survey. The entire questionnaire results can be viewed in Appendix B. Understanding what destinations are important to them and where they would ride too assisted in the development of bicycle projects. These projects are incorporated into the final plan and prioritized for implementation.

1.4.5 Bicycle Audit

In order for the Steering Committee and the Town staff to truly understand the difficulties facing the bicycle community, a Bicycle Audit was conducted on June 19, 2010. Leading the audit was Dan Burden from Walkable and Livable Communities, Inc. Dan Burden is a national expert on pedestrian and bicycle issues, who has traveled across the country and the world educating communities about the importance of good pedestrian and bicycle facilities. His focus over the last 15 years has been to make cities and towns more walkable and pedestrian friendly. He is also known for his ability to engage the community and to rally support for improving pedestrian and bicycle mobility. Mr. Burden engaged the participants during the bicycle audit by asking questions and pointing out specific issues with the roads, land use and building orientation. In addition to Mr. Burden, the group was also accompanied by a Union County Sheriff's Deputy for safety purposes.

Two different routes were chosen to provide the participants the opportunity to experience issues affecting different areas of the Town. The first route began in the parking lot of the Sun Valley Retail Center near the intersection of Old Monroe Road and Wesley Chapel Road. Participants traveled on the following roads during the first route: Wesley Chapel Road, Rodgers Road, Brandon Oaks Parkway, Pony Trail Lane and Mustang Drive. Along the way participants noted the various conditions along the route, including the lack of room on the road to ride, especially on Wesley Chapel Road. Conditions were more favorable along the neighborhood streets, such as Brandon Oaks Parkway shown in the image to the left.

Participants of the Bicycle Audit riding along Brandon Oaks Parkway

The second route took the group on a tour of the downtown area. The group started at the Civic Building and made their way north along Indian Trail Road toward US 74. The participants bypassed US 74 by traveling through the business park on Post Office Drive. Traveling through the business park, the participants made their way to the new 10-foot wide multi-use path that was recently completed along US 74/Independence Boulevard. Staff explained that this sidewalk was required to be built as part of the Citizens South Bank construction. Staff also pointed out that the Town's first bike rack was installed as part of the new construction. Mr. Burden explained to the group the importance of projects like this and the requirements in the Town's UDO. The Town's UDO requires that development along Highway 74 provide a 10-foot wide multi-use path (1110.090 Q 7). There are several segments along US 74 that have been built; however, they don't currently create a significant and continuous path. Eventually, as new construction occurs and existing parcels are redeveloped, these segments will be connected to each other to create a 10-foot wide multi-use path.

Dan Burden explains the importance of good policies during the bicycle audit

After the bicycle audit, the participants were invited back to the Civic Building for lunch and to

watch a short presentation by Dan Burden. Mr. Burden provided a Power Point presentation setting the most important basic and advanced principles and tools for a bicycle friendly community. These principles, practices and tools were explained, and then best practices were shown. Communities of similar size, scale and complexity were shown, enabling community members to see how their community could plan for and implement a working system.

1.4.6 Social Media

With the increased use in social media to connect with friends, follow user groups and communicate quickly, it was decided to attempt to use Facebook to receive input from the community. A Bicycle Master Plan user group was created on Facebook. The intent behind the use of Facebook was to allow individuals the opportunity to post comments, have everyone see them immediately, and be able to respond. It also allowed individuals to post pictures from around the community of areas where they think bicycle facilities are needed. One specific comment that was posted by one of the Steering Committee members was regarding four separate cyclists that were riding to Francis Beatty Park using Weddington Road and Chestnut Lane.

"A few observations this past weekend regarding bike usage around town: Coming from Siskey YMCA Saturday morning, I saw 4 separate bikers in a 2-mile radius on Weddington Road and Chestnut Lane who appeared to be headed to/coming from Francis Beatty Park. All were doing fine riding on narrow-to-nonexistent shoulders and blending with traffic, but it sure would be nice to have some bike lanes, especially connecting the area of Austin Village with Beatty Park (GREAT trails over there). It was so nice to see more and more bikers out on our roads. Also do to the lack of any convenient greenways in Indian Trail; I took the family to McApline Greenway off of Sardis Road in Charlotte on Sunday. It would be nice to have something like that nearby. I envy those homeowners that can ride a little trail out of their neighborhoods and connect to this expansive network of well-kept, wide open, scenic greenways. It's great how they're wide enough for a police car/park employee vehicle to access for safety purposes."

- Steering Committee Member -

1.5 Vision and Goals

The input received from the initial public workshop, the stakeholder interviews, meetings with the Steering Committee, discussions with the Town staff and results from the questionnaire led to the development of a vision statement and key goals. The vision statement and the goals from this plan, along with the vision and goals identified in previous plans, have guided the development of the Bicycle Master Plan and will continue to do so once the plan is adopted.

BICYCLE MASTER PLAN VISION

"To promote a bicycle-friendly environment within Indian Trail by improving connectivity between neighborhoods and destinations; where multi-use paths, greenways and bicycle facilities are further developed and integrated, and all users are provided safe and convenient access."

"Indian Trail will work to forge partnerships, educate the community, and design facilities that are safe and pleasing."

1.5.1 Bicycle Master Plan Goals

The following are the goals that were developed during the process in order to achieve the vision statement that is listed above. The goals listed below mirror the goals that were identified in the Comprehensive Plan. These goals, like the vision statement, will continue to guide the implementation of the Bicycle Master Plan.

- Future bicycle facilities should be planned and designed with all users in mind
- Future bicycle facilities should be accessible for everyone
- Improve bicycle connectivity between existing and future residential subdivisions, schools, and other destinations throughout town.
- Bicycle facilities that are built should be safe, accessible, inviting and aesthetically pleasing
- The Town should develop programs that educate motorists and bicyclists
- Improve bicycle safety on existing roads

Bicycle rodeos can teach children basic skills that they can carry through the rest of their lives

- Plan and design facilities for both recreational and transportation users
- Incorporate bicycle facilities into future roadway projects
- Educate the children on the importance of health, safety, and the use of bicycle facilities
- Indian Trail's future bicycle infrastructure should connect to surrounding communities and their bicycle facilities
- Bicycling has to be an important priority for the community
- The development of partnerships will be critical for the success of this plan
- The Town should work with NCDOT to reduce automobile speeds on roadways
- Future bicycle facilities need to connect to Downtown

1.6 Observations

The process to develop this Bicycle Master Plan started back in 2005 with the completion of the Comprehensive Plan and continues today. The Comprehensive Plan provided recommendations for an improved transportation network that included facilities for all users. The benefits of a comprehensive and multi-modal transportation network are well documented and will improve the overall viability and sustainability of Indian Trail and the region. The public input that was received during this process supports the need for Indian Trail to continue to work toward creating this comprehensive transportation network and to improve bicycling conditions throughout the town. Indian Trail should continue to involve the public as it begins to implement the recommendations of this plan and future transportation improvements.

Teaching Children Safety Tips at Bike Appreciation Day

[1] North Carolina Office of State Budget and Management: http://www.osbm.state.nc.us/ncosbm/facts_and_figures/socioeconomic_data/population_estimates/demog/muntot09.htm

[2] U.S. Census Bureau – American Community Survey: http://www.census.gov/compendia/databooks/2010/tables/sma A-63.xls

[3] The Journal of the American Medical Association: http://jama.ama-assn.org/cgi/content/full/303/3/235?ijkey=ijKHq6YbJn3Oo&keytype=ref&siteid=amajnls

[4] Pedestrian and Bicycle Information Center: http://www.bicyclinginfo.org/why/benefits_health.cfm

[5] Pedestrian and Bicycle Information Center: http://www.bicyclinginfo.org/why/benefits_transportation.cfm

[6] National Household Travel Survey: http://nhts.ornl.gov/index.shtml

[7] Pedestrian and Bicycle Information Center: http://www.bicyclinginfo.org/why/benefits_environment.cfm

[8] American Automobile Association: http://www.aaaexchange.com/Assets/Files/200948913570.DrivingCosts2009.pdf

[9] U.S. Energy Information Administration: http://www.eia.gov/oil_gas/petroleum/data_publications/wrgp/mogas_history.html

[10] National Trails Training Partnership: http://www.americantrails.org/resources/benefits/homebuyers02.html

[11] Pedestrian and Bicycle Information Center: http://www.bicyclinginfo.org/why/benefits_quality-of-life.cfm

CHAPTER 2

Inventory & Analysis

Bike It

Indian Trail Bicycle Master Plan

Chapter 2:
Inventory & Analysis

2.1 Overview

CHAPTER 2 – OUTLINE:
Overview
Community Concerns, Needs & Priorities
Assessment of Existing Physical Conditions
Assessment of Existing Bicycle Facilities
Summary

This chapter provides an overview of the existing physical conditions of the transportation network as well as the non-physical aspect, such as user and trip characteristics. Understanding the existing conditions of the town is an essential part of creating a successful bicycle master plan.

2.2 Community Concerns, Needs and Priorities

Chapter 1 provided an overview of the Public Input process and the feedback that was received during each of the public input sessions. Gathering and understanding this information is essential for developing recommendations that respond to the residents' needs and concerns, and to generate public enthusiasm and interest for the implementation of the plan. The main concerns that were expressed are summarized below.

- The current transportation network is not safe for bicyclists
- There is a lack of connectivity between existing subdivisions, schools and other destinations around town
- Future bicycle facilities should be designed to be accessible for all users
- Educational programs are needed for both drivers and bicyclists
- There are major barriers, such as US 74 and CSX railroad, that impede bicycle mobility throughout the town
- Indian Trail's future bicycle network should connect to adjacent jurisdictions
- Future parks should include off-road bicycle trails
- The high traffic volumes and speeds on the thoroughfares is an impediment to cycling

In addition to gathering input from the community, it is necessary to document the existing bicycle infrastructure, identify where the major gaps and barriers are and assess the existing user groups and trip characteristics.

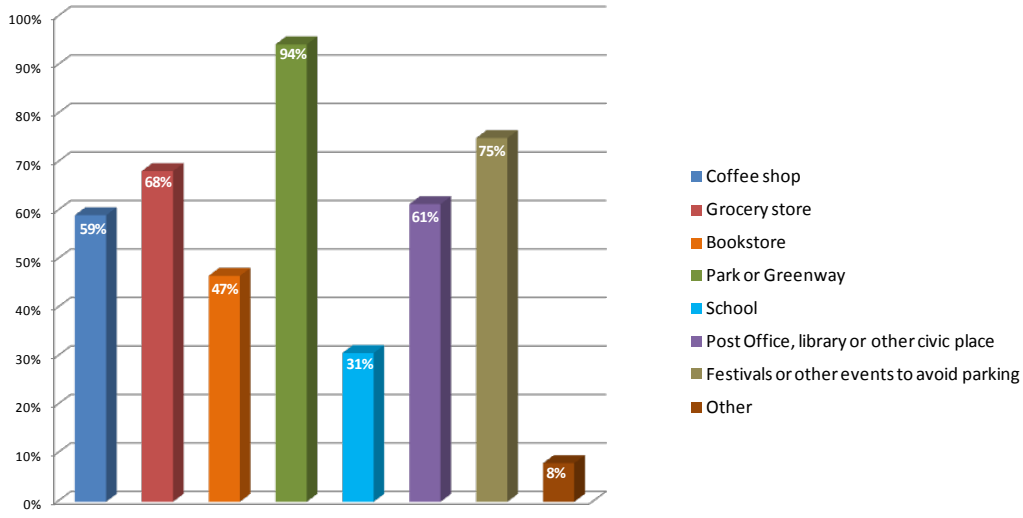
2.2.1 User Groups and Trip Characteristics

To develop an effective and usable bicycle system, it is important to identify the different user groups and the types of facilities they prefer. It is also important to understand the purpose of their trips. Of the 95 respondents who took the online questionnaire, 71% said they were between the ages of 26 and 45. In addition, 92% said that they bike for exercise and 81% said they bike for recreation or leisure. A significant number (66%) ride on neighborhood streets

and (53%) ride on trails, which indicate that many of the respondents don't feel comfortable riding on the existing thoroughfares. Even though this may not be a complete representation of the community, it still provides some valuable information to help identify the types of user groups within Indian Trail. Typically user groups can be divided into three main categories:

- **Advanced cyclists** – The advanced bicyclist is comfortable riding in traffic and is riding for convenience and speed and wants direct access to destinations with a minimum of detour or delay.[1] They travel further and tend to bicycle for exercise or to commute to work.
- **Basic cyclists** – The basic bicyclist is comprised of adults or teenagers who feel safe using neighborhood streets or off-road trails, such as greenways. They are casual or new cyclists and are less secure in their ability to ride in traffic without special accommodations. They typically prefer to ride on roads that have low traffic volumes and speeds and tend to ride for recreational purposes.
- **Children** – This group tends to share many of the same traits as the adult and teenager. They typically ride on neighborhood streets that have low traffic volumes and speeds. This group includes children that are 12 or younger. Often times, the younger children ride on sidewalks to get oriented before they advance to the street.

The questionnaire that was utilized to gather additional public input, provided insight to the places people currently cycle and where they would cycle to if there were sufficient bicycle facilities. Most of the respondents (94%) said that



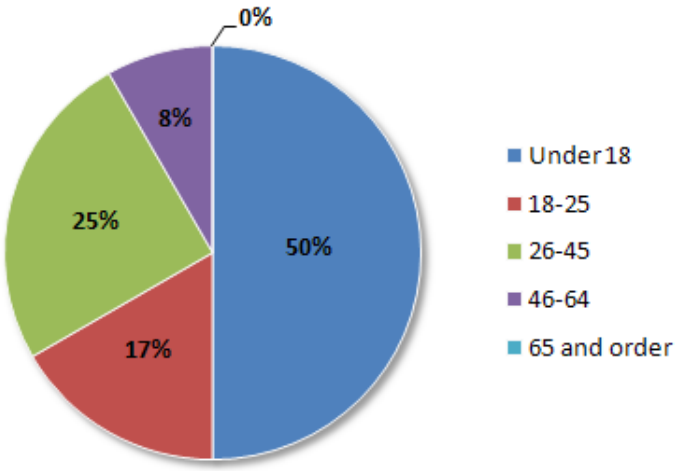
Note: Respondents were allowed to choose all that applied

they would bicycle to parks or greenways if there were sufficient facilities. The current state of the transportation network is such that individuals will only bike on the neighborhood streets or drive to a location that has bicycle facilities. Many survey respondents and stakeholder said they drive into Mecklenburg County and use the greenways and parks there.

2.3 Assessment of Existing Physical Conditions

2.3.1 Crash Data

Crash data can provide some insight as to where the potential trouble areas are located within the Town of Indian Trail. According to the North Carolina Bicycle and Pedestrian Crash Data, between the years 2000 and 2008, there were a total of 12 crashes. Of these crashes, 50% of them involved individuals under the age of 18. Often times bicycle crashes are not reported; therefore, the total number of crashes is probably much higher. The low number of crashes does not necessarily indicate that the Town has adequate bicycle facilities; rather, it could be attributed to the fact that Indian Trail has no bicycle facilities, resulting in a low number of bicyclists actually riding on the streets. The Town should continue to monitor bicycle related crashes in the future to help determine community needs and problem areas. In addition, the Town should continue to build on the outreach that was conducted during the development of this plan, which includes bicycle rodeos, bicycle safety tables at community events, updates on the Town's web page and continued use of Facebook as a means to educate and share ideas and issues with the community.



Source: North Carolina Bicycle and Pedestrian Crash Data, Years 2000-2008 for Indian Trail.

2.3.2 Gaps and Barriers within the System

The Town of Indian Trail has many types of road typologies within its jurisdiction. A majority of the streets are neighborhood streets that have low speed limits and low traffic volumes. Neighborhood streets are typically what most basic bicyclists feel comfortable riding on. The second street typology would be the thoroughfare. Most of the thoroughfares are 2-lane roads with no shoulders and drainage ditches on either side. These roads are not considered barriers that require bridge accommodations for bicyclists, but they are very hazardous for bicyclist to ride on. They are dangerous because there is not enough room to share the road. This causes the motorist to pass too closely to the bicyclist, which can cause the cyclist to crash or swerve into traffic. In an ideal situation, there should be enough room for the motorist to pass within the lane or the bicyclist could ride within a wide shoulder.

Existing 2-lane thoroughfare

Finally, the Town of Indian Trail has a limited access state highway; Independence Boulevard (US 74) and is awaiting the construction of the Monroe Bypass Connector. Currently, US 74 bisects the Town and does not contain any infrastructure that allows bicyclists to easily cross it. To prevent future disconnect within the community, Town officials have been proactive and are working with the North Carolina Turnpike Authority (NCTA) to ensure that the Monroe Bypass Connector does not create barriers or gaps in the future bicycle and pedestrian network. That coordination has led to the inclusion of bike lanes along the access roads were possible.

Existing Subdivisions and lack of connectivity

Another barrier within the community is the lack of connectivity between the existing residential and non-residential subdivisions. Neighborhood streets are ideal for basic bicyclists to ride on; however, only some of the newer subdivisions actually connect to adjacent subdivisions. Many of the older subdivisions were built with a cul-de-sac street pattern. This type of street pattern prevents connectivity between adjacent subdivisions. The fact that they do not connect, forces bicyclists to ride on the thoroughfares to get to their destinations. The Town's Unified Development Ordinance (UDO) now requires this type of connectivity; therefore, as the town continues to grow, future subdivisions will be better connected and allow bicyclists to ride to their destinations without having to ride on the dangerous thoroughfares. In fact, Section 1110.090 (B) states "the

proposed street system shall be designed to provide a network of interconnected streets." Also, Section 1110.090 (M) Dead-End Streets requires that "Streets shall be designed to provide interconnectivity."

2.3.3 Greenways/Multi-Use Paths

Currently, there are no publicly owned or operated greenways within the Town of Indian Trail; however, there are several segments of a multi-use path along US 74. The Town's Unified Development Ordinance (UDO) now requires new development to install a 10-foot wide multi-use path along US 74. There are several segments that exist today, totaling approximately 2,600 feet; however, these segments do not connect, but in time, as development and redevelopment occurs, there will be a continuous multi-use path along US 74. In addition, the Town also requires 10-foot wide sidewalks within their Village Centers as identified in the Comprehensive Plan.

Existing multi-use path along US 74

In addition to the multi-use paths along US 74, some of the newer residential subdivisions within Indian Trail have developed internal greenway and trail systems. These trails are private and are intended to be used for the residents of that particular neighborhood. Connectivity to and from these facilities to the larger town-wide system will provide residents the option to ride to destinations outside of their subdivisions.

2.3.4 Transit Interface

Charlotte Area Transit System (CATS) currently operates an Express Bus route (74X) along US 74 that provides service to south Mecklenburg County and northern Union County. There is a park & ride located along US 74 within the Town at the Union Towne Center by Food Lion.

Typically the park & ride lots are supplied with parking for both motorists and bicyclists. However, the location at the Union Towne Center does not have bicycle parking for users. For now bicyclists may take their bikes with them by utilizing the front mounted bicycle

racks located on the bus. CATS have provided a video online that illustrates how these front-mounted bike racks work. To view the demo, please follow the link provided below:

http://charmeck.org/city/charlotte/cats/Bus/ridingcats/Pages/bicycle.aspx

2.4 Assessment of Existing Bicycle Facilities

The Town of Indian Trail does not currently have any defined bicycle routes within the town. However, there are small segments of a multi-use path along US 74. These segments have been built due to new requirements that are detailed in the Town's UDO. Currently there is approximately 2600 linear feet (almost a ½-mile) of existing multi-use path along US 74 within Indian Trail. The requirement is intended to create a continuous multi-use path along US 74 to allow users to access destinations and travel safely along the highway. The Town also requires new development to provide parking for bicyclists, and because of this requirement, the Town now has its first bicycle rack, as required by the UDO which was installed during a recent development along US 74.

2.5 Summary

Based on the feedback from the community and physical inventory of the existing transportation network, it is evident that there are many barriers and gaps that have to be overcome to create a safe bicycling environment within Indian Trail. However, the Town continues to be proactive and work with state agencies and surrounding municipalities to develop projects and programs that will one day result in a comprehensive transportation network that includes facilities for bicyclists. It will be important for the Town to engage the community and educate about state laws as bicycle infrastructure is incorporated into the existing transportation system. Continuous education will help reduce crashes and increase the overall safety of all users.

[1] Guide for the Development of Bicycle Facilities. American Association of State Highway and Transportation Officials, 1999. Chapter 1: Design, pg. 6.

CHAPTER 3

Plans, Programs & Policies

Bike It

Indian Trail Bicycle Master Plan

Chapter 3:
Plans, Programs & Policies

3.1 Overview

CHAPTER 3 – OUTLINE:

The success of the Bicycle Plan cannot be realized simply by installing physical improvements. The physical improvements need to be accompanied by strong programs and policies. There are many plans, programs and policies that exist today that will contribute to the success of the Bicycle Master Plan. This chapter provides an overview of existing plans, programs and policies from the local, regional and state levels. Many of these have already helped lay the groundwork for a successful bicycle program in Indian Trail and will continue to do so in the future.

3.2 Existing Plans

3.2.1 Local Plans

As detailed in Chapter 1, the Town has made significant strides in creating a more connected and bikeable community. Each of the plans listed below provides some recommendation that is directly linked to creating a more bicycle friendly community. For a more detailed summary of each plan and how it relates to the Bicycle Master Plan, please see Chapter 1.

- Comprehensive Plan (adopted 2005)
- Downtown Master Plan (adopted 2006)
- Pedestrian Master Plan (adopted 2008)
- Parks and Greenway Master Plan (adopted 2010)

3.2.2 Regional Plans

Several regional initiatives are underway that the Town has been coordinating with to ensure that bicycle facilities are incorporated and that regional connectivity is achieved.

- Carolina Thread Trail Regional Greenway Plan: The Carolina Thread Trail (CTT) is a proposed 15 county regional network of multi-use greenways and trails that will connect people to major destinations throughout the area. The system of trails will also help preserve and protect the natural areas and provide educational opportunities. The Town has been working closely with Union County, adjacent municipalities and the CTT to designate a greenway/trail system that will connect Union County to

the regional network. A specific alignment has not been determined at this time. For more information about the Carolina Thread Trail visit the Carolina Thread Trail web page at: http://www.carolinathreadtrail.org/

- Monroe Connector/Bypass (NCTA): The North Carolina Turnpike Authority is currently planning and designing the Monroe Connector/Bypass, which is a proposed toll highway that will extend from the interchange of US 74 and I-485 in Mecklenburg County to an area between the Towns of Wingate and Marshville in Union County. The project is approximately 20 miles long and will improve mobility, capacity and help alleviate congestion along US 74. The toll road is planned to be built in the northern part of the town and will have a major impact on vehicular and bicycle mobility. Indian Trail has been working with the NCTA to ensure that the toll road does not create a barrier within the town, and that bicycle facilities are factored into the design of the access roads and bridges that will be built as part of the toll road. To learn more about the Monroe Connector/Bypass, please visit the North Carolina Turnpike Authority's web page at:

  http://www.ncturnpike.org/projects/monroe.

- 2035 Long Range Transportation Plan (LRTP): The LRTP is a required document that MUMPO develops that prioritizes transportation projects for the Mecklenburg-Union County region. The U.S. Department of Transportation (DOT) mandates that urbanized areas must cooperatively assess and prioritize their transportation needs. The 2035 LRTP has a list of projects for the region and the widening of Indian Trail road to four lanes is listed in the "Funded and Committed" table in the LRTP. Again, the Town should work closely with MUMPO and NCDOT to ensure bicycle facilities are included into the planning and design of this roadway improvement project. This will be especially important as MUMPO begins the process of updating the LRTP in spring of 2011. For additional information on the LRTP, please visit the following web page http://www.mumpo.org/2035_LRTP.htm.

3.2.3 State Plans

- 2009-2015 North Carolina Transportation Improvement Program (STIP): The NCTIP identifies projects and strategies that Mecklenburg-Union Metropolitan Planning Organization (MUMPO) and NCDOT plan to undertake over the next seven years. The STIP is used to allocate funding to a large list of projects and initiatives and is updated at least every two years. The Town will need to work closely with NCDOT and MUMPO to ensure bicycle facilities are considered during the planning

and design of future TIP projects. The following is a list of projects that are in the STIP:

- Monroe Bypass/Connector
- Widening of Indian Trail Road to 4-lanes
- Indian Trail Road/Old Monroe Road Intersection Improvements
- Planning and Environmental Document for Old Monroe Road
- Rogers Road sidewalk
- Unionville-Indian Trail sidewalk

To learn more about the STIP and the projects listed above, please visit the State Transportation Improvement Program at:

http://www.ncdot.org/planning/development/tip/tip/

3.2.4 Local, State and National Guidelines

There are a handful of State and National documents that will provide the Town with guidance on the future planning and design of bicycle facility improvements. The Standards and Guidelines that are detailed in Chapter 5 were developed based on these State and National standards.

- North Carolina Bicycle Facilities Planning and Design Guidelines: This guideline was developed in 1994 to provide guidance to municipalities throughout the state on planning and designing bicycle facilities. These design guidelines should be used in conjunction with more recent national guidelines, such as the AASHTO Guide for the Development of Bicycle Facilities as well as materials from the Institute of Transportation Engineers. To see the entire publication, please use the following link: http://www.ncdot.gov/_templates/download/external.html?pdf=http%3A//www.ncdot.gov/bikeped/download/bikeped_projdev_Facil_Planning_Guide_full.pdf
- A Guide to North Carolina Bicycle and Pedestrian Laws: This pamphlet was developed by the North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation that municipalities, such as Indian Trail, may use to educate the public on the State's general statutes, ordinances and resources. To download the pamphlet, please use the following link:

  http://ncdot.gov/bikeped/lawspolicies/

- Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways (2009 Edition): The MUTCD is a national document that is published by the Federal Highway Administration (FHWA) that defines

the standards used by engineers and planners to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic. To view and download a copy of this manual, please use the following link: http://mutcd.fhwa.dot.gov/

- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities: This document is one of the most comprehensive and widely used for the development of new bicycle facilities to enhance and encourage safe bicycle travel. The intent of this manual is to provide guidance to help accommodate bicycle travel in most riding environments. The manual provides guidelines to follow when constructing or improving highways and designing and constructing bicycle facilities. It also provides recommendations for the operation and maintenance of bicycle facilities.

3.3 Programs and Policies

3.3.1 Safety and Education Programs

The successful implementation of this bicycle plan and creation of a safe bicycle environment throughout the Town of Indian Trail will require more than just infrastructure improvements. Educational opportunities will need to be developed and implemented and coordinated with the Union County Schools System and the Union County Sheriff's Office. Educating children at an early age will allow them to develop skills earlier and understand the laws within the state of North Carolina, as well as help reduce the number of future bicycle crashes. In addition to these, the Town should continue to develop and expand on the following programs:

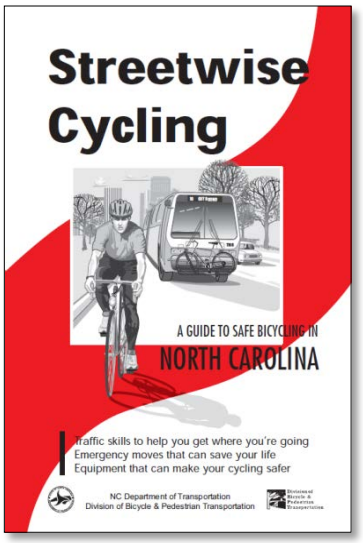
- Local Advocacy Groups – The Charlotte Area, including Indian Trail, is fortunate to have many local and regional bicycle advocacy groups. Advocacy groups can be a great resource for education as well as volunteering at bicycle events. Listed below are just some of the groups that are located in the Charlotte region. Additional groups can be found by going to Bike Charlotte's web page at:

  http://www.bikecharlotte.com/evtListing.asp?evt=Club.

  - Charlotte Area Bicycle Alliance (CABA): CABA is a group of bicycle advocates who work with communities to create a bicycle friendly community through cycling awareness, education, safety advocacy and promotion.
  - Cannonballs Cycling: This group of bicycle enthusiasts is comprised of mostly road bike riders who organize bike rides

with others throughout the community; however they also participate in and promote bicycling awareness through bicycling safety rodeos for children in the community.

- Dirt Divas: The Dirt Divas are a mountain biking club for women of all ages and skill levels who make it easier to find compatible women riders by scheduling group rides and events. They strive to protect the environment by participating in regular trail maintenance and our involved in the community with bicycle advocacy.
- Trips for Kids: A group of public officials, corporate and private citizens, who have fundamental beliefs that cycling is an empowering sport that can help kids achieve "breakthrough" results in their lives. This group provides mentoring through off-road bike rides and the Earn-A-Bike program.
- Tarheel Trailblazers: The club was founded in 1990 and is a 501 (c) (3) non-profit organization that is comprised of volunteers from around the Charlotte area. The volunteers work directly with local land managers, building and assisting in the maintenance of mountain biking trails throughout the Charlotte region.



Educational Material available through NCDOT

- Educational Materials – There are several types of educational materials that are available through the North Carolina Department of Transportation. The Town should invest in obtaining some of these to provide to the community at special events throughout the year. In addition to these materials, the Town should develop a Town-wide Bike Map that contains safety tips for all users.
- Web-Based Materials – The Town has already started using the internet to educate and inform the residents and visitors about bicycling. The use of the Town's web page and social media, such as Facebook, should continue to be used as the Bicycle Plan is implemented to inform users of new routes, safety tips, and other useful information.
- Local Events – The Town facilitates many different events throughout the course of year. These events are ideal venues for promoting and educating on the Bicycle Master Plan. The Town should use these events to hand out safety and education materials to the community.

3.3.2 Encouragement Programs

Providing on-road facilities is not always enough to encourage biking in a community. Other opportunities need to be pursued in order to get individuals to bike more. There are some organizations that the Town can partner with to encourage biking.

- Charlotte Area Transit System (CATS) – Several years ago, CATS implemented a system wide bike rack on bus programs, where all buses were retrofitted with bike racks on the front of the vehicle. By implementing this, bicyclists could take their bikes with them across town to their destination. CATS currently operates a commuter bus route, known as the Express Route 74x that travels along US 74. The 74x stops at the Union Towne Center near the Food Lion. Currently, there are no bicycle facilities at the Park and Ride; however, the Town should encourage CATS to install bike racks and/or lockers for bicyclists to use. Installation of bike racks or lockers may encourage more people to ride their bike to the transit stops and use public transit.

- Bicycle Rodeo – Throughout this planning process, the Town has facilitated bicycle rodeos to inform children about proper bicycling techniques, such as steering, riding in a straight line, avoiding obstacles, proper hand signals when turning and properly wearing a helmet. This is not currently an annual event, but the Town should consider dedicating a week to Bicycle Safety and using the bicycle rodeo as a component to educate the community.

3.3.3 State Programs and Initiatives

- State Transportation Improvement Program – As mentioned earlier, the TIP is the process that the State uses for prioritizing the planning, design and construction of transportation projects. Bicycle related projects may be included in this list of Transportation Improvement Projects as either "incidental" projects, or as a stand along project where there is no scheduled roadway improvement, known as an "independent" project.

3.3.4 Bicycle Related Policies

There are many requirements in the Town's Unified Development Ordinance (UDO) that encourage and even require the development of pedestrian and bicycle facilities. The following sections of the Town's Unified Development Ordinance are those directly related to the development of bicycle facilities.

- Chapter 350. Subdivisions (350.130) –All Preliminary and Final Plats must show the location of bicycle and pedestrian paths.
- Chapter 960. Prohibited Signs (960.010 and 960.020) – Provides guidance on prohibited signs that hamper the vision of motorists and cyclists
- Chapter 1010. General Requirements (1010.020A) – Provides incentives to developers who provide bicycle parking.
- Chapter 1030. Bicycle Parking (1030.010) –The Town's UDO has detailed parking space requirements based on the type of use. The following table is from the Town's UDO and defines the minimum bicycle parking requirements.
- Chapter 1030. Bicycle Parking (1030.20A, B and C) – This section of the UDO provides specific requirements for the placement, type and security of bicycle racks.

Use Group	Specific Use Types	Minimum Bike Parking
Public/Institutional Uses	Libraries, Museums, Public Parks, Hospitals, Post Office	1 bike parking space per 15 parking spaces
Planned Developments/ Cluster Subdivisions (Residential)	Club houses, recreational buildings or facilities, and other amenity areas or facilities	1 bike parking space per 15 parking spaces
Assembly Uses	Churches, Public and Private Schools, Auditoriums, Stadiums	1 bike parking space per 15 parking spaces
Entertainment Uses	Skating Rinks, Golf Courses, Theaters, Health Clubs	1 bike parking space per 20 parking spaces
Retail and Business Services	Convenience stores, Shopping centers, Restaurants	1 bike parking space per 25 parking spaces
Employment Uses	Offices, Industrial Services, Manufacturing	1 bike parking space per 25 parking spaces

- 1070.010 (F) (2) Parking and Loading Design – Connectivity to retail and commercial uses for pedestrians and bicyclists is important. This chapter requires developers to provide pathways and lighting for pedestrians and bicyclists.
- 1110.060 (D) (1) General Subdivision Provisions – Subdivisions are now required to be designed to incorporate an integrated system of lots, streets, trails, and infrastructure that provides for efficient movement of people, bicycles and automobiles within the subdivision and to and from adjacent development.
- 1160.010 (A) Open Space Dedication – The Town's UDO also requires that residential subdivisions shall dedicate a portion of land or pay a fee in lieu thereof for public parks, greenways, recreation, and open space sites to serve the recreational needs of the residents of the subdivision or development.
- 1160.060 Open Space Dedication – Greenways may be credited toward the requirements of Section 1160.010 provided that such greenways are part of the Town's Comprehensive Pedestrian Plan and dedicated to public use. An easement will be recorded for any greenway and such easement will provide for public access for pedestrians, bicyclists, and others expected to make use of this open space.

3.4 Observations

The Town has taken great strides in improving their ordinance over the last five years to include measures that will ensure bicyclists are safe; that infrastructure is built in the future; and the infrastructure is connected and coordinated in a comprehensive manner.

Currently, most of the existing major thoroughfares are not suitable for the average bicycle traveler, and unfortunately, with limited funds at the local and state levels, most of these roads will not be improved for at least 15-20 years. This plan has been designed to address the physical and monetary deficiencies through the creation of Neighborhood Loops. The Neighborhood Loops, which are explained in more detail in Chapter 4, are a series of loop routes that primarily utilize neighborhood streets suitable for the average bicyclist. This approach will allow the Town to plan more efficiently in the short-term until funding becomes available to improve the major thoroughfares.

CHAPTER 4

Bicycle System

Bike It

Indian Trail Bicycle Master Plan

Chapter 4:
Bicycle System

4.1 Overview

A comprehensive bicycle system will create improved connectivity throughout the Town and provide residents and visitors with transportation options not currently available. Also, understanding that connectivity does not end at the jurisdictional lines of the Town of Indian Trail, the recommendations in this plan also take into account existing and proposed bicycle facilities in adjacent communities. The plan recognizes the need to access destinations outside of the Town's jurisdictional limits, therefore connecting to adjacent communities will be important to the implementation of this bicycle system.

The Bicycle System detailed in this chapter is based on the community's vision and goals and the inventory of the existing bicycle system. This chapter provides a description of the methodology used to create the physical aspect of the bicycle system as well as an overview of the types of bicycle facilities that have been planned.

4.2 Methodology

The Bicycle System was developed by reviewing the Town's previous planning efforts, inventorying existing bicycle facilities and gathering input from the public through stakeholder interviews, public workshops and an online survey.

One of the major goals of this plan was to create a bicycle system that provides connections to various destinations throughout the town, which includes the Town's Village Centers. The Village Centers were conceptualized in the Town's Comprehensive Plan and are areas within the town where there will be a concentration of higher density residential mixed with commercial, retail and office uses. The Village Centers are intended to be pedestrian and bicycle friendly with an improved network of sidewalks and bicycle facilities, including bike lanes and multi-use paths.

To gain an understanding of the Town's current bicycle system and to assess the improvements that would be needed to create a more bikable community, an inventory of the town's current road network was conducted on July 1, 2010. Currently, there are several segments of a 10-foot wide multi-use path along US 74. These segments have been built by new businesses as a requirement of the Town's Unified Development Ordinance (UDO). These segments do not currently create a significant multi-use path; however, over time this will change and eventually there will be a continuous multi-use path that bicyclists can use to access destinations along US 74. There is approximately ½-mile (2,600-feet) of multi-use path that has been built as of today. The segments along US 74 have been identified and can be seen in Figure 4.1 the Existing Bicycle System

Map. There are also several bike racks that are located at commercial centers throughout town.

Today, the existing major thoroughfares within Indian Trail are not suitable for bicycle travel. Most of the major thoroughfares are two lane roads that have no usable shoulder and contain drainage ditches on both sides. Due to the lack of bicycle facilities throughout the town and funding to improve these roads, alternatives to create connectivity had to be explored.

Discussions with the Steering Committee, Town staff, stakeholders and the public led to the idea that if existing and future neighborhood streets could be connected, then bicyclists would be able to get to destinations without having to travel on thoroughfares that do not accommodate them. These discussions moved into mapping exercises where people began to indicate on a map where they lived and where they would like to bike to. It quickly became apparent that there needed to be a system of neighborhood loops that would connect to destinations. There was also a desire to create a system of longer, town-wide connections through the use of existing major thoroughfares, overhead transmission lines, railroad corridors and sewer easements.

4.3 The Bicycle System

The Bicycle System Map illustrates how the proposed bicycle transportation system will provide connectivity throughout the town and to adjacent communities. The Bicycle System Map (Figure 4.2) includes a system of Neighborhood Loops, Town-Wide Connectors and Neighborhood Connectors. The following sections of this chapter provide a detailed description of these different systems and how collaboratively they will create a comprehensive bicycle transportation system.

4.3.1 Neighborhood Loops

As discussed in Chapter 2, there are three types of cyclists: advanced, basic and children. Of the three groups, most people fall within the basic or children categories. These groups typically enjoy riding on streets with low traffic volumes and speeds. To accommodate these user types, the neighborhood loop system is comprised of mostly neighborhood streets, some major thoroughfares and off-road connectors allowing users to access destinations within and adjacent to Indian Trail. The premise behind the neighborhood loop system is that the Town should focus on making improvements to neighborhood streets and connecting existing and future subdivisions. When this is achieved, bicyclists are able to access destinations within close proximity to their homes with minimal travel along the major thoroughfares. The neighborhood loops can be seen in Figure 4.3 and have been identified with the loop number. Each loop in

Figure 4.3 is numbered and below is a short description of each. Most of the neighborhood loops that are illustrated in Figure 4.3 create an actual loop system; however, loops 12-19 do not actually create a physical loop. These particular segments provide important connections to the actual loops, and therefore are grouped into this category.

Each loop contains several segments, and each segment has been assigned a specific type of bicycle improvement (i.e. bike lane, wide shoulder, etc). The Bicycle Matrix, located in Appendix C, provides a detailed inventory of all the neighborhood loops and the segments that comprise each. A detailed illustration for each loop can be found in Appendix D (Neighborhood Loop Graphics). Each loop was assigned a loop number; however, this number does not signify any priority. It is merely a number that assisted in the identification of each loop system.

- Loop #1 – This loop is located in the western portion of the town and connects the neighborhood of Brookhaven to the Antioch Village Center and Antioch Elementary School.
- Loop #2 – Located to the east of Loop #1, Loop #2 provides a connection for the Brookhaven and Worwood neighborhoods to Austin Village, which is centered around the intersection of Chestnut Lane and Potter Road.
- Loop #3 – This loop provides connectivity for several neighborhoods in the western portion of Indian Trail. Loop #3 connects to the Austin Village Center and the Downtown Village Center.
- Loop #4 – Located between the Downtown Village Center and the Old Monroe Village Center, this loop connects several neighborhoods to retail destinations located at the intersection of Old Monroe and Indian Trail Road.
- Loop #5 – Situated in downtown, this loop provides connection for the neighborhoods of The Village at Indian Trail and Rushing Park to downtown and Indian Trail Elementary School.
- Loop #6 – This loop is located on the west side of Old Monroe Road and connects Brandon Oaks, Moore's Park, Holly Park and Stoney Creek to the Old Monroe Village Center.
- Loop #7 – This loop connects 10 different neighborhoods to the Sun Valley Village Center and Shiloh Elementary School, Sun Valley Elementary, Middle and High Schools.

- Loop #8 – Located at the intersection of Highway 74 and Indian Trail Fairview Road, Loop #8 connects 4 neighborhoods to First Baptist Church, Wal-Mart and other retail/commercial destinations.
- Loop #9 – Centered around Poplin Elementary School, Loop #9 connects Bonterra Village and Annandale to Rocky River and Porter Ridge Village Centers.
- Loop #10 – This loop is part of Pilot Project #1 and is located in the eastern part of the town. It connects Hemby Acres and Beacon Hills to the Idlewild Village Center.
- Loop #11 – Also part of Pilot Project #1, Loop #11 connects to Loop #10 and provides a route for those living in the Crismark neighborhood to the Idlewild Village Center.
- Loop #12 – Located just west of Poplin Road, Loop #12 provides a connection for Bonterra Village subdivision to Hemby Bridge Elementary School.
- Loop #13 – This loop connects 8 different subdivisions to two village centers and Sardis Elementary School and is located between Unionville Indian Trail Road and Faith Church Road.
- Loop #14 – Located between Rodgers Road and Old Charlotte Road, Loop #14 provides an important connection between Meadow Glen and Sandalwood neighborhoods.
- Loop #15 – This loop utilizes a variety of neighborhood streets within the Brook Valley and Meriwether neighborhoods to provide a connection between Wesley Chapel Road and Rodgers Road.
- Loop #16 – Situated just south of the Downtown Village Center, Loop #16 connects the Colton Ridge subdivision to loops #4 and #3.
- Loop #17 – This loop meanders through the Bonterra and Annandale subdivisions using neighborhood streets to provide a bicycle route for the residents of these neighborhoods.
- Loop #18 – Loop #18 is located north of Unionville Indian Trail Road and connects Arbor Glen and Braefield to the Sardis Village Center.
- Loop #19 – Located just north of Chestnut Lane, Loop #19 connects 5 different subdivisions to the Austin Village Centers, which is centered on the Potter Road and Chestnut Lane intersection.

4.3.2 Town-Wide Connectors

During the stakeholder interviews, cross-town connectivity was discussed to ensure opportunities for cyclists to commute to and from work. Participants of the interview process identified alternative corridors to the existing thoroughfare system for cross-town connections. Several corridors were identified that provide significant town-wide connections, based on feedback.

The town-wide connectors utilize overland utility easements, sewer easements, railroad corridors, streams/creeks and existing/proposed major thoroughfares. The connectors that follow the streams/creeks, the railroad and overland utility easements are recommended to be greenways. Those that utilize existing and proposed thoroughfares should be built as either bike lanes or multi-use paths as outlined in the proposed roadway network in the Town's Comprehensive Plan. The town-wide connectors have the ability to connect various regional destinations to one another, allowing not just residents of Indian Trail to bike to them, but those adjacent to and beyond the town limits.

Each of these corridors will require significant coordination with many entities, including, but not limited to Duke Energy, CSX Railroad, NCDOT, and Union County Public Works Department. Some barriers include property ownership and liability. The town-wide connectors can be seen in Figure 4.4 and are labeled by segment number. Additional information for each town-wide connector is provided in the Bicycle Matrix in Appendix C.

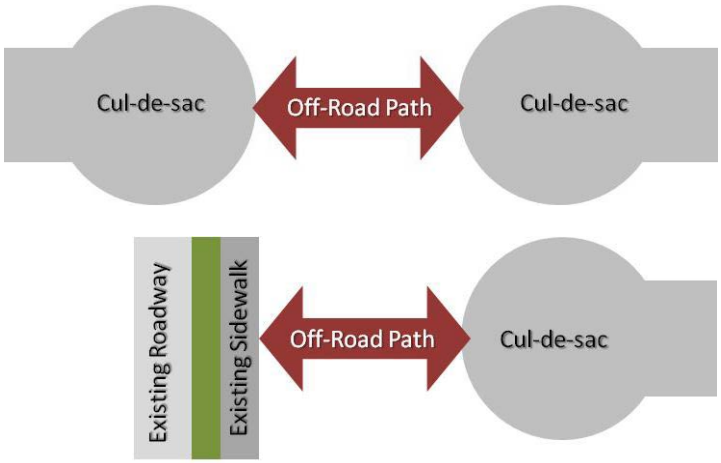
- Town-wide connector #1 – This connector is an on-road connector and utilizes Chestnut Lane to provide connectivity from the western portion of the town to Highway 74. It connects to Town-wide connectors #2, #6, #8 and #12.
- Town-wide connector #2 – This connector is part of the proposed greenway system that was identified in the Comprehensive Plan and utilizes a combination of existing streams, including South Fork, Crooked Creek and North Fork. It begins near the Downtown Village Center and ends near Porter Ridge Elementary School. It provides connectivity to several different destinations throughout town as well as to loops #1, #3, #4, #6, #7, #8.
- Town-wide connector #3 – This is an off-road connector that utilizes one of the few overhead transmission line paths within the town. It begins in the southwest part of the town near Goldmine Road and extends to the northeast part of the town at Lawyers Road.
- Town-wide connector #4 – This connector utilizes Wesley Chapel Stouts Road to connect three different Village Centers and three proposed

park locations from the Park and Greenway Master Plan. This provides a good west to east connection through the Town.

- Town-wide connector #5 – This town-wide connector utilizes an overhead transmission line to provide an off-road connection for several subdivisions. It begins near Goldmine Road and extends north crossing Rodgers Road and ends at Old Charlotte Highway.
- Town-wide connector #6 – Town-wide connector #6 is the only connector to use an active railroad corridor. This connector would be a rails-with-trails initiative and would provide great north-south connectivity for the Town. It connects to five different town-wide connectors, including #1, #2, #3, #4 and #7.
- Town-wide connector #7 – Connector #7 utilizes Indian Trail Road and connects the western side of the town to the eastern side.
- Town-wide connector #8 – Town-wide connector #8 utilizes Highway 74 and provides great north-south connectivity for the Town. Currently, pieces of this connector already exist and as redevelopment occurs along this corridor, 10-foot wide multi-use paths will be developed.
- Town-wide connector #9 – Utilizing Secrest Shortcut Road, town-wide connector #9 connects the Idlewild Village Center with the Rocky River Village Center.
- Town-wide connector #10 – Connector #10 extends north from connector #7 and uses Mill Grove Road. It connects to the Idlewild Village Center.
- Town-wide connector #11 – This town-wide connector utilizes an overhead transmission line located in the southern most portion of the town just south of Goldmine Road.
- Town-wide connector #12 – This town-wide connector utilizes an overhead transmission line to provide an off-road connection for several subdivisions and extends from the Antioch Village Center north to Old Monroe Road just south of Interstate 485.

4.3.3 Neighborhood Connectors

Many of the Town's current subdivisions were built with a cul-de-sac pattern that is characterized by limited access from major roads, and internal circuitous roads resulting in little connectivity between neighborhoods. This development pattern has created travel behaviors that rely on automobile use. As discussed earlier, if the Town can begin encouraging development to connect to adjacent developments, more neighborhoods would be connected, allowing bicyclists to ride to their destinations instead of using their car.



There are several opportunities throughout the town to connect existing subdivisions through off-road connectors. These links can be formalized by creating short paved off-road trails that provide a safe connection between two neighborhoods. The images above illustrate two basic types of off-road connections; (1) cul-de-sac to cul-de-sac connections, and (2) cul-de-sac to existing sidewalk connections.

In addition, other elements should be considered, such as lighting for safety and maintenance responsibility. Since most of these connections occur in subdivisions, the Town will need to closely coordinate with each neighborhood separately. The Neighborhood Connections Map (Figure 4.5) illustrates where these opportunities exist throughout the town. The community should continue to explore and locate opportunities like these to link existing neighborhoods to each other.

- Neighborhood Connector #1 – This connector is part of Pilot Project #1 and is intended to formalize an existing connection at the end of Clearwater Drive. This connector would provide easier access to the retail/commercial destinations located at the intersection of Idlewild and Mill Grove Roads.
- Neighborhood Connector #2 – Located at the end of Red Lantern Road, this connector would formalize an existing connection that individuals have made between Red Lantern Road and Crismark Drive.
- Neighborhood Connector #3 – Located at the end of Devon Drive, this connector formalized an existing off-road path that has been created by the community. This connector is necessary to complete Loop #14.

- Neighborhood Connector #4 – This connector is located off of Streamlet Way and would provide a formal connection to town-wide connector #5 which is adjacent to the Brook Valley subdivision.
- Neighborhood Connector #5 – Located in the Meriwether subdivision, neighborhood connector #5 would provide a formal connection at the end of Washburn Court to town-wide connector #5.
- Neighborhood Connector #6 – Neighborhood connector #6 is located off of Salmon River Drive and would provide a formal connection to town-wide connector #5 for the Meriwether subdivision.
- Neighborhood Connector #7 – This neighborhood connector is located in the Meriwether subdivision and would connect Sunlight Path Drive to Brook Valley Run.

4.3.4 Project Prioritization

There has been and continues to be strong support for improving bicycle mobility within the Town of Indian Trail. This was evident by the feedback received at the public workshops, the online survey and the involvement of the Steering Committee. To maintain and build upon that support, it is important for the Town to implement the recommendations outlined in this plan. The bicycle improvement projects listed in the Bicycle Matrix have been prioritized based on the rating criteria that were developed through input from the Steering Committee, the Town staff and feedback from the community. The project prioritization is explained in further detail in Chapter 6: Plan Implementation.

4.3.5 The Bicycle Matrix

The Bicycle Matrix was developed to list and organize all of the proposed bicycle improvement projects identified in the Neighborhood Loops, Town-wide Connectors and the Neighborhood Connectors. The Bicycle Matrix should be used by the Town to assist in monitoring the actual implementation of the projects. The list of projects in the Bicycle Matrix should be updated periodically. A detailed explanation of the Bicycle Matrix is provided in Chapter 6: Plan Implementation and the Bicycle Matrix can be found in Appendix C.

4.4 Conclusion

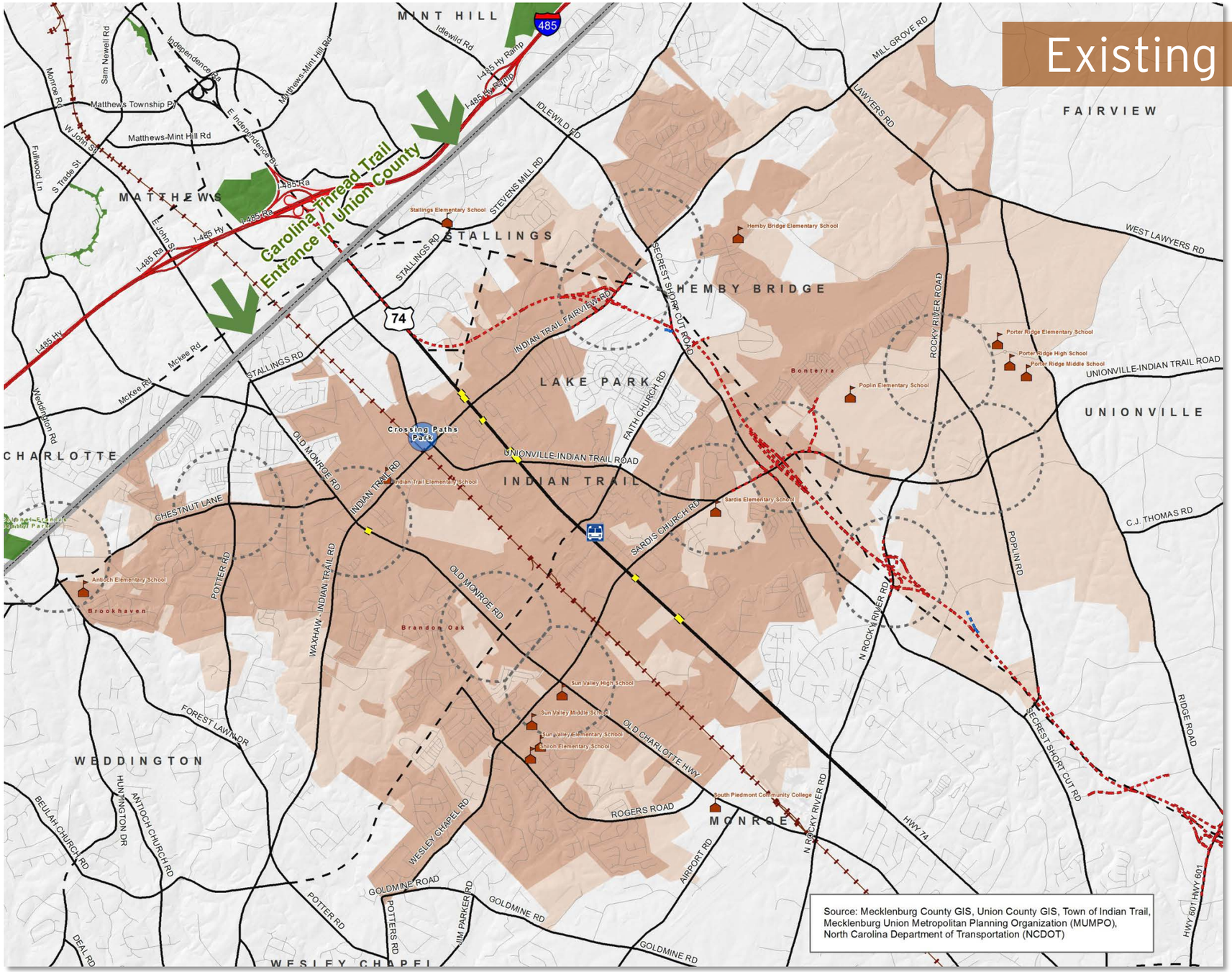
With limited funding at all levels (federal, state and local) to be able to build the pedestrian and bicycle infrastructure that is needed to facilitate users to their destinations, Indian Trail will need to focus on alternatives to creating connectivity. This chapter has described a system of neighborhood loops and town-wide connectors that, over time, will help overcome the current gaps and

barriers. In the short-term, the Town should focus on connecting subdivisions through the neighborhood loops and connectors. The neighborhood loops and connectors will not only improve connectivity, they will also increase bicycle usage within the community. The results of the questionnaire that was mentioned in earlier chapters indicated that many users prefer neighborhood streets that have low traffic volumes and speeds. Unfortunately, due to the complexity of the town-wide connectors and the lack of funding, they will take longer to develop; however, the Town should begin coordinating with state agencies, utility companies and surrounding municipalities immediately to plan for these connections.

Bike It

Indian Trail Bicycle Master Plan

Figure 4.1: Existing Bicycle Facility Map

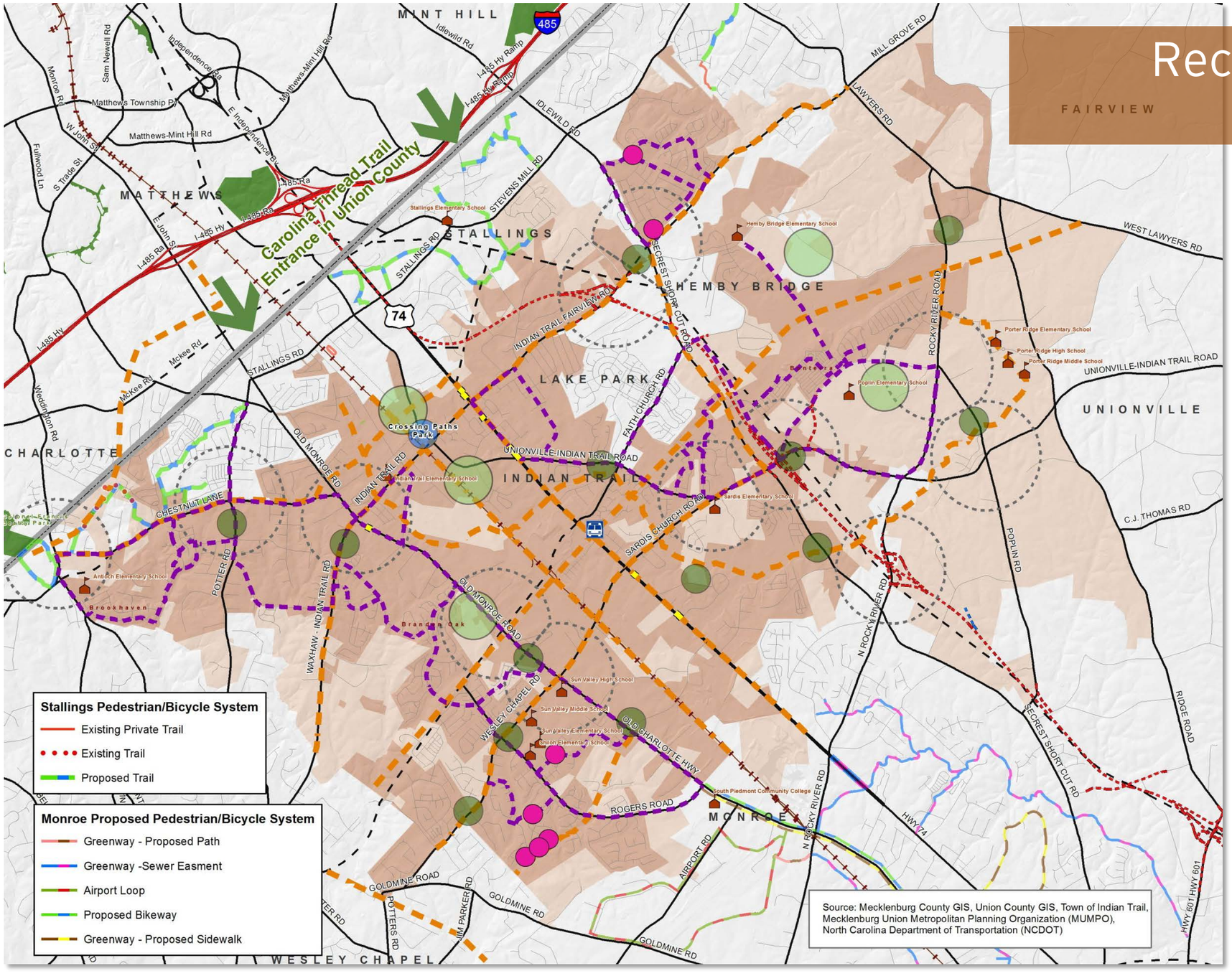


Legend

- Schools
- CATS Park & Ride
- Existing Multiuse Path
- Existing Crossing Paths Park
- Future Monroe Bypass
- Future Monroe Bypass Service Roads
- Interstates
- MUMPO Thoroughfare (Existing)
- MUMPO Thoroughfare (Proposed)
- Union County Roads
- Railroads
- Mecklenburg County Parks
- Village Center Overlay
- County Boundary
- Indian Trail
- Planning Area

Source: Mecklenburg County GIS, Union County GIS, Town of Indian Trail, Mecklenburg Union Metropolitan Planning Organization (MUMPO), North Carolina Department of Transportation (NCDOT)

Figure 4.2: Recommended Bicycle System Map



Stallings Pedestrian/Bicycle System
- Existing Private Trail
- Existing Trail
- Proposed Trail

Monroe Proposed Pedestrian/Bicycle System
- Greenway - Proposed Path
- Greenway -Sewer Easment
- Airport Loop
- Proposed Bikeway
- Greenway - Proposed Sidewalk

Source: Mecklenburg County GIS, Union County GIS, Town of Indian Trail, Mecklenburg Union Metropolitan Planning Organization (MUMPO), North Carolina Department of Transportation (NCDOT)

Legend
- Schools
- CATS Park & Ride
- Existing Multiuse Path
- Proposed Neighborhood Connector
- Proposed Neighborhood Loop
- Proposed Townwide Connector
- Existing Crossing Paths Park
- Proposed Indian Trail Neighborhood Parks
- Proposed Indian Trail Community Parks
- Future Monroe Bypass
- Future Monroe Bypass Service Roads
- Interstates
- MUMPO Thoroughfare (Existing)
- MUMPO Thoroughfare (Proposed)
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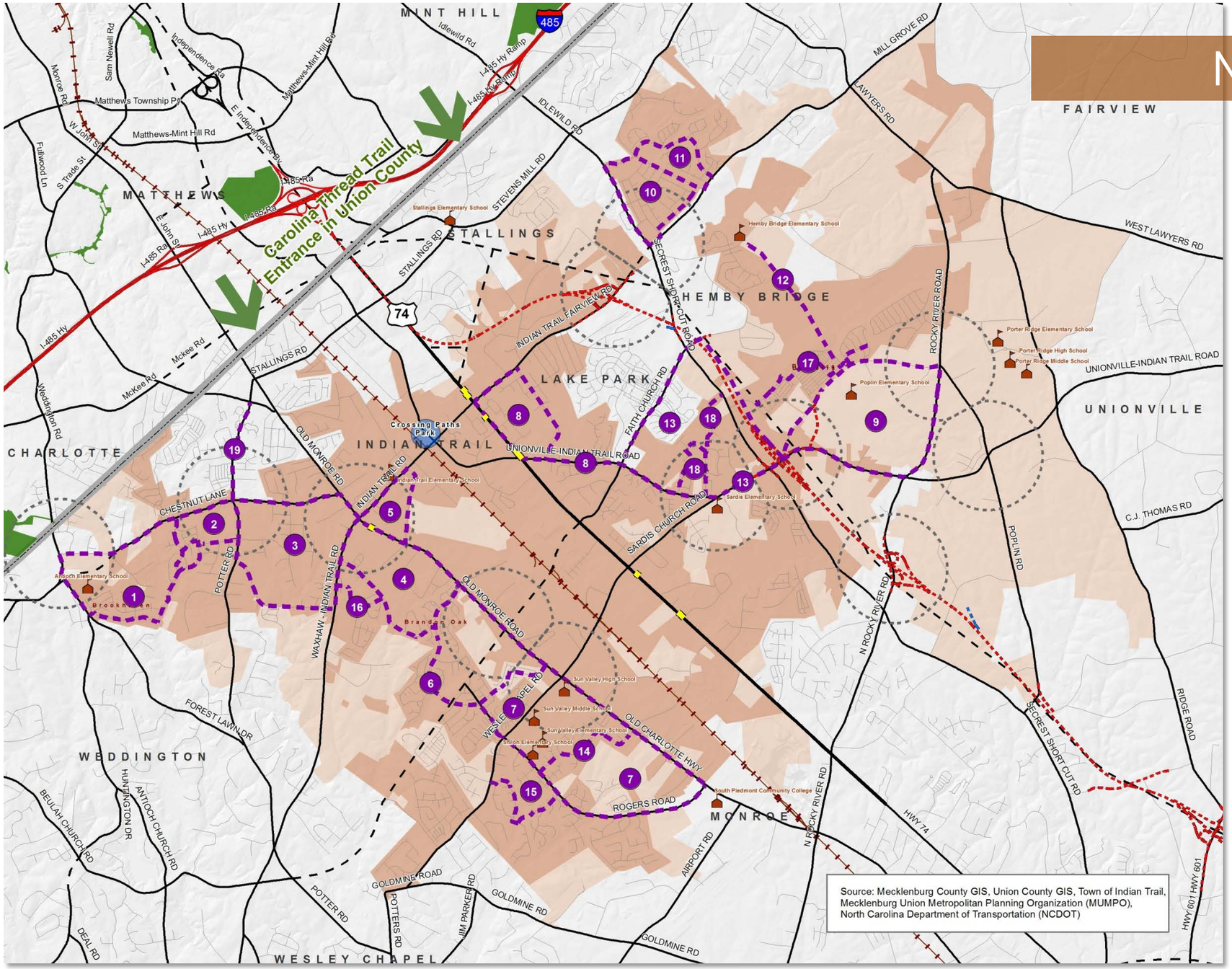
Figure 4.3: Neighborhood Loops



Source: Mecklenburg County GIS, Union County GIS, Town of Indian Trail, Mecklenburg Union Metropolitan Planning Organization (MUMPO), North Carolina Department of Transportation (NCDOT)

Legend

- Schools
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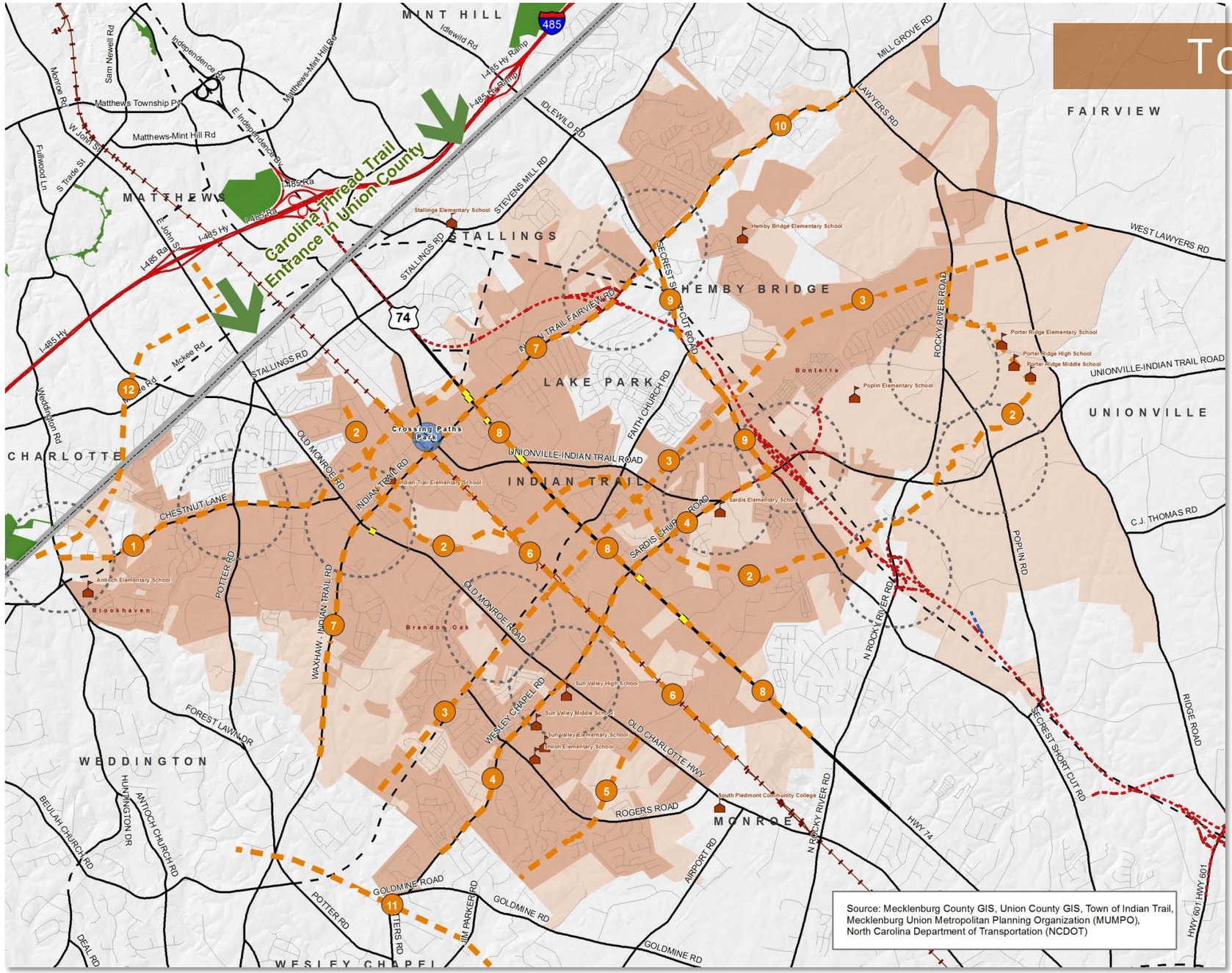
- Indian Trail
- Planning Area

Figure 4.4:
Town-Wide Connectors



Legend

- Schools
- CATS Park & Ride
- Existing Multiuse Path
- Proposed Townwide Connector
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- Future Monroe Bypass Service Roads
- Interstates
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- MUMPO Thoroughfare (Proposed)
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- Railroads
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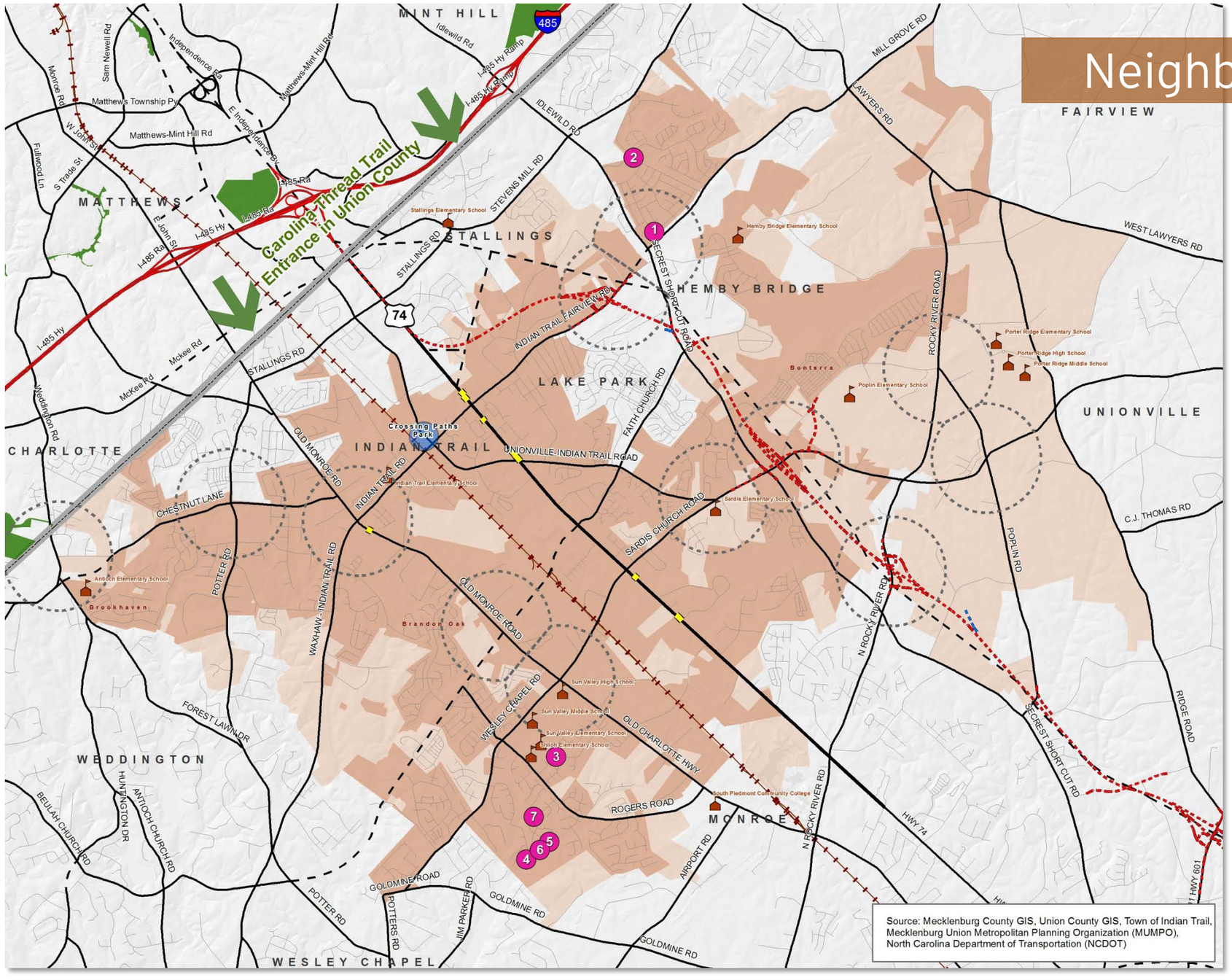
- Planning Area

Figure 4.5: Neighborhood Connectors



Legend

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Bike It

Indian Trail Bicycle Master Plan

CHAPTER 5

Facility Standards & Guidelines

Bike It

Indian Trail Bicycle Master Plan

Chapter 5:
Facility Standards & Guidelines

5.1 Overview

This chapter provides guidance for the design of future bicycle improvements that have been identified in this plan. The standards and guidelines detailed in this chapter are a compilation of guidelines that adhere to the State and National standards developed by the North Carolina Department of Transportation (NCDOT), the American Association of State Highway Transportation Officials (AASHTO) and the Manual on Uniform Traffic Control Devices (MUTCD).

These standards and guidelines should only be used as a reference. A certified engineer and/or landscape architect should be consulted when designing and constructing these facilities. This chapter is merely an overview of some of the standards and guidelines available. Additional design standards and guidance can be obtained by visiting the following web pages:

- North Carolina Department of Transportation: http://www.ncdot.gov/bikeped/projectdevelopment/design_guidelines/default.html
- American Association of State Highway Transportation Officials http://transportation. org/
- Manual on Uniform Traffic Control Devices (MUTCD) http://mutcd.fhwa.dot.gov/

In addition to these resources, additional guidance for the development of bicycle facilities can be found by visiting the following web pages.

- Association of Pedestrian and Bicycle Facilities: http://www.apbp.org/
- The National Center for Bicycling and Walking: http://www.bikewalk.org/index.php
- Pedestrian and Bicycle Information Center: http://www.pedbikeinfo.org/
- Institute of Transportation Engineers: http://www.ite.org/

The images that are used throughout this chapter were taken from the Pedestrian and Bicycle Information Center's (PBIC) Image Library (unless otherwise noted). According to the PBIC, the images are intended to serve as examples of the range of real world existing conditions. They are not limited to best practices or approved design and in some cases may reflect conditions that are not recommended.

5.2 Neighborhood Signed Route

Neighborhood Signed Routes utilize neighborhood streets with low traffic volume and lower speed limits. Most of the neighborhood loops that were described in Chapter 4 will be neighborhood signed routes. These routes are preferred by the basic bicyclists because there is less conflict with motorists. The Neighborhood Signed Routes identified in this plan have been chosen to direct users to destinations using a system of neighborhood streets. Since bicycle route continuity is important, directional changes should be signed with appropriate arrow subplaques.[1]

It is recommended that the Town of Indian Trail strategically sign a few routes to raise awareness and visibility of bicycling, but continue to assess the effectiveness of signage prior to signing all the proposed neighborhood routes.

Minimum Design Standards	• 12-14-foot outside lane
Ancillary Facilities	MUTCD signs: • M1-8 (bicycle route sign) • D11-1 (bicycle route guide) • W11-1 (bicycle warning sign) • W16-1 (share the road plaque)
References	• NCDOT Bicycle Facilities Planning and Design Guidelines (1994) • AASHTO Guide for the Development of Bicycle Facilities (1999) • MUTCD 2003 Edition – Part 9 Traffic Controls for Bicycle Facilities

5.3 Off-Road Connector

Off-Road Connectors can create linkages between neighborhoods; allowing cyclists the opportunity to bicycle throughout the town without having to travel on congested and dangerous thoroughfares. The off-road connector is typically a paved trail or path that links existing neighborhoods. In many cases, these connectors already exist and are informal worn paths between two streets or through wooded areas. All of the neighborhood connectors that were mentioned in Chapter 4 are off-road paths that currently exist and need to be formalized to provide a safe connection for pedestrians and bicyclists.

There are many opportunities for these connectors throughout the town. This plan has only identified a few, but it is recommended that the Town continue to search for these opportunities and to formalize them to make them safer.

Minimum Design Standards	• 8-10 foot wide asphalt trail • 2-foot wide shoulders (crushed stone or turf) • 16-feet minimum horizontal clearance
Ancillary Facilities	• Trail signage • Regulatory signs (MUTCD signs, R5-3, W11-1 and W11-2) • Bollards
References	• NCDOT Bicycle Facilities Planning and Design Guidelines (1994) • AASHTO Guide for the Development of Bicycle Facilities (1999) • MUTCD 2003 Edition – Part 9 Traffic Controls for Bicycle Facilities

5.4 Greenways

Greenways are paved or natural trails. They typically follow streams, sewer easements, and/or railroad right-of-way. Greenways can provide excellent recreational opportunities and can serve as transportation corridors. Greenways are also used to control flooding, improve water quality, protect wetlands, conserve habitat for wildlife, and buffer adjacent land uses. Greenways and trails can also follow utility rights-of-way, such as overhead transmission lines and railroad corridors. The Town's Park and Greenway Master Plan includes recommendations for a system of greenways and parks that have been identified and incorporated into the development of this plan.

Minimum Design Standards	• 8-10 foot wide asphalt trail or natural trail • 2-foot wide shoulders (crushed stone or turf) • 16-feet minimum horizontal clearance
Ancillary Facilities	• Signs - warning, regulatory and guiding • Trash receptacles • Benches • Intersection warning signals and signs • Bollards
References	• Mecklenburg County Parks and Recreation Greenway Standards • NCDOT Bicycle Facilities Planning and Design Guidelines (1994) • AASHTO Guide for the Development of Bicycle Facilities (1999)

5.5 Increase Lane Width

Increased Lane Width refers to the outside through lane that is wide enough to accommodate cyclists and allow motorists to pass safely. They can be marked with a sharrow symbol and signed or just signed. These lanes are typically 12-14 feet wide, but where grades are steeper, the recommended width is 15-feet in order to allow bicyclist more room for maneuvering.[2]

Minimum Design Standards	• 12-14 foot wide outside lane (14-feet is preferred)
Ancillary Facilities	• Bike route warning and guide signs • (MUTCD: W11-1 and W16-1) • Sharrow marking (optional)
References	• NCDOT Bicycle Facilities Planning and Design Guidelines (1994) • AASHTO Guide for the Development of Bicycle Facilities (1999) • MUTCD 2003 Edition – Part 9 Traffic Controls for Bicycle Facilities

5.6 On-Street Parking

On-Street Parking increases the potential for conflicts between motor vehicles and bicyclists. Bicyclists in this situation are subject to opening car doors, vehicles exiting parking spaces and extended mirrors that narrow the travel lane. These situations typically occur in more urban areas, such as a downtown or a residential area, where on-street parking is permitted. Therefore, it is recommended that a minimum of 12-feet of combined bicycle travel and parking width be provided.

Minimum Design Standards	• 12-feet of combined bicycle travel and parking width
Ancillary Facilities	• Bicycle route signs • Regulatory signs • Pavement markings (including sharrow) • Striping
References	• NCDOT Bicycle Facilities Planning and Design Guidelines (1994) • AASHTO Guide for the Development of Bicycle Facilities (1999) • MUTCD 2003 Edition – Part 9 Traffic Controls for Bicycle Facilities

5.7 Paved Shoulders

Paved shoulders include the portion of the roadway that is outside the designated travel lane. The paved shoulder can be marked or unmarked. When marked they should utilize the "share the road" signage so motorists are aware of the bicycle route.

Minimum Design Standards	• 12-foot wide travel lane • 4-foot wide paved shoulder
Ancillary Facilities	• - Bike route waning and guide signs (MUTCD D11-1, W11-1, and W16-1)
References	• NCDOT Bicycle Facilities Planning and Design Guidelines (1994) • AASHTO Guide for the Development of Bicycle Facilities (1999) • MUTCD 2003 Edition – Part 9 Traffic Controls for Bicycle Facilities

5.8 Bicycle Lanes

A Bike Lane is the portion of the road that is striped, marked and signed for bicycle travel. Bike lanes should be one way and carry bike traffic in the same direction as motorists. Delineating a bike lane can increase a cyclist's confidence that a motorists will not stray into their path of travel. Likewise, a passing motorist is less likely to swerve into a cyclist if their travel lane is separated from the bike lane. In many communities, bike lane visibility is enhanced by colorizing the pavement of the bike lane itself (see image below). This is an optional treatment that will be discussed later in this chapter.

Minimum Design Standards	• Roads with curb/gutter the width should be 4 ft, not including the gutter pan. • With on-street parking the combined width of the parking and bicycle lanes should be 12 ft. • Bicycle safe drainage grates • MUTCD Regulatory Signs: R3-17, R3-17a,R3-17b, W11-1 and W16-1
Ancillary Facilities	• Bike route signs and regulatory signs • Pavement markings and striping • Bicycle safe drainage grates
References	• NCDOT Bicycle Facilities Planning and Design Guidelines (1994) • AASHTO Guide for the Development of Bicycle Facilities (1999) • MUTCD 2003 Edition – Part 9 Traffic Controls for Bicycle Facilities

5.9 Intersections

Bicyclists at intersections and mid-block crossings can pose conflicts with motorists. Proper lane striping, signage and warning signals can minimize this conflict. At signalized or stop-controlled intersections with right-turning motor vehicles, the solid striping to the approach should be replaced with a broken line. In addition, detectors for traffic-actuated signals should be sensitive to bicycles and should be located in the expected path of the bicyclist.

There are several types of intersections that a cyclist may encounter. Each of these requires the appropriate striping, marking and signing to ensure the proper behavior for cyclists and motorists.

- Bike Lanes at Signalized Intersections
- Midblock Crossing (non-signalized)
- Railroad Crossings
- Grade Separated Crossings (below grade and above grade)

5.9.1 Bike Lanes at Signalized Intersections

As a bicyclist approaches an intersection, it is critical to maintain the presence of the bicycle lane for the safety of the cyclist and the motorist. At an intersection where the cyclist is going straight and the motorist is turning right, paths must cross. Marking and signing configuration which encourage these crossings through merging in advance of the intersection are generally preferable to those that force the crossing in the immediate vicinity of the intersection.[3]

Bike Lane approaching signalized intersection

Bike lane striping should not be installed across any pedestrian crosswalks, and in most cases should not be installed through an intersection. In addition, at a stop controlled or signalized intersection where a right turn lane exists, the solid striping to the approach of the intersection should be replaced with a dotted or broken line (Figure 5.1). The length of the dotted line can vary from 50-200 feet depending on intersection. According to the MUTCD, the dotted lines should be 2-feet in length and 6-feet apart. Additional guidance for intersection treatments can be found in Chapter 9 of the MUTCD.

5.9.2 Path-Roadway Intersections

The ideal location for these crossings is at signalized or stop control intersections; however, there are instances where this is not always feasible and must be managed. Each intersection is unique and will require sound engineering judgment as to the appropriate solution. There are three basic categories of path-roadway intersections:

- Midblock
- Adjacent Path
- Complex

Each of these intersection types may cross any number of roadway lanes, divided or undivided, with varying speeds and volumes of motor vehicle traffic, and may be uncontrolled, or more typically, sign or signal controlled.[4]

- Midblock Crossings – The midblock is the most straightforward of the intersections listed above. When a bike path crosses a roadway at a non-signalized location, the crossing should occur well away from major intersections with other roadways. In addition, median refuges should be considered so that bicyclists can cross one direction of travel at a time. If possible, the median refuge should be angled to force bicyclist to look at on-coming traffic. This allows the bicyclist to make eye contact with the motorist and provides better visibility to on-coming traffic. Pavement markings and signage must be provided to notify the bicyclist and the motorist of the crossing. The Manual on Uniform Traffic Control Devices (MUTCD) provides specific guidance on the location and type of markings and signage for the midblock crossing. Another midblock crossing that should be considered is the skewed crossing. When possible, a bikeway should cross at a 90 degree angle, but when right-of-way requirements become an issue, 45 degree crossings are acceptable.

Angled mid-block intersection crossing

- Adjacent Path Crossings – This crossing occurs where a bike path crosses an existing intersection of two roadways (T-intersection or 4-way). This type of crossing should be integrated as close as possible to the existing intersection of the two roadways. This configuration can create multiple conflict between the user and the motorist, especially those that are turning from the parallel street onto the cross street. Right-of-way assignment, traffic control devices, and separation distance between the roadway and path are also important variables which greatly affect the design of this type intersection. Further complicating the situation is the possibility of the conflicts being unexpected by both path users and motorists. Clear sight lines across corners are especially important.[5] In addition proper signage and striping is necessary to improve the safety for all users at this type of intersection. The AASHTO Guide for the Development of Bicycle Facilities provides specific guidance on the placement of signage and pavement markings for the adjacent path crossing.

- Complex Intersection Crossings – The complex intersection is basically all other path-roadway or driveway intersections. These may include a variety of configurations at which the path crosses directly through an existing intersection between two (or more) roadways and there may be any number of motor vehicle turning movements. Improvements to these intersections should be evaluated on a case-by-case basis. It is fundamental that the improvements facilitate all users safely through the intersection.

5.9.3 Railroad Crossings

Since there is a major railroad that travels through Indian Trail, it is important to understand how to plan and design for a bicycle route crossing. Ideally, the bike route crossing should be smooth and occur as close to a 90 degree angle as possible. Special rubberized crossings and flangeway fillers should be considered when deviating from the 90 degree angle. Any crossing that is less than 45 degrees will need to be widened to ensure the proper angle. Please

reference the AASHTO Guide for the Development of Bicycle Facilities for further guidance on the flangeway fillers.

5.9.4 Grade Separated Crossings

There will be occurrences where an "at-grade" crossing is not feasible, and depending on the specific crossing, the bikeway will have to go over or under the existing roadway. These crossings are known as "above-grade" and "below-grade." The following describes in detail the specific requirements for each.

- Above-Grade Crossing – In some instances, an overpass or separate bridge is necessary to provide continuity to a bikeway or shared-use path. Although an expensive option, building a designated bridge for pedestrians and bicyclists is sometimes the only option.

Existing bridges without bike facilities can be very difficult to retrofit, particularly if there are no sidewalks. Retrofitting any bridge should be carefully considered before actual implementation. An engineering study would need to be performed to determine if retrofitting the bridge would be a safe and viable option.

If developing a separate bridge for bicycle and pedestrian travel, AASHTO recommends that a minimum clear width be the same as the approach paved path, plus a minimum of 2-foot wide clear areas. Therefore, for a 10-foot wide asphalt trail, the bridge width would be a minimum of 12-14 feet. Railings on either side are required and should be a minimum of 54 inches high.[6] In addition, the design of the bridge structure should consider the potential use by emergency vehicles. Restricting illegal vehicles from using the bridge is important; therefore, removable bollards should be installed at the ends of the bridge.

- Below-Grade Crossing – The below-grade crossing occurs under an existing roadway through the use of an existing roadway or separate tunnel, such as a culvert.

When considering the use of an underpass or tunnel, lighting, grades, approaching curve design, visibility and maintenance should be carefully considered.[7] The following guidelines should be used when creating a below-grade crossing.

- Warning signs: MUTCD sign W5-4a "Bikeway Narrows" should be located at least 50 feet in advance of obstruction and OM3-L and OM3-R should be located on the adjacent obstruction.
- Vertical Clearance – Minimum of 8-10 feet.
- Horizontal Clearance – Minimum of 12-feet.

5.10 Ancillary Facilities

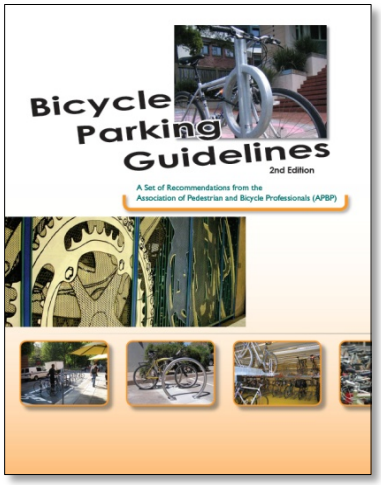
Ancillary facilities are supplemental components necessary to ensure a successful bicycle system. There are a range of facilities that fall into this category, and this section provides an overview of those. Ancillary facilities include but are not limited to the following:

- Bicycle parking
- Signage
- Striping and pavement markings
- Signalization
- Bicycle user maps
- Maintenance

5.10.1 *Bicycle Parking*

An essential component of any successful bicycle system is sufficient bicycle parking. Parking should be provided for bicyclists at both the origin and destination and should offer protection from theft and damage. In fact, the Bicycle Parking Guidelines from the Association of Pedestrian and Bicycle Professionals (APBP) suggests that the lack of secure parking discourages many people from using their bicycles for basic transportation.[8] At the most basic level, according to the APBP, bicycle parking encourages people to ride, but it also has some specific benefits, even for non-cyclists:

- Bicycle parking is good for business.
- Designated, well-designed parking promotes a more orderly streetscape and preserves the pedestrian right-of-way
- Bicycle parking helps legitimize cycling as a transportation mode by providing parking opportunities equal to motorized modes.[9]



There are two basic types of bicycle parking that should be provided depending on the specific site that is being considered: Short-Term and Long-Term.

- Short-Term Parking – Short-term parking provides bicyclists with a secure, convenient and accessible place to park their bikes. This type of parking is usually for two hours or less. Possible locations include commercial/retail centers, medical/healthcare, parks and recreation areas and community centers.


Source: Town of Indian Trail

The design of the parking structure is simple and is typically unprotected from the weather. There are many types of short-term parking options; however, the Town of Indian Trail is requiring an inverted "U"-type construction in their Unified Development Ordinance (1030.020B). In addition, an alternative high-quality design within the Downtown Master Plan Overlay, so that there is consistent design and appearance of bicycle racks within the downtown.

- Long-Term Parking – Long-term parking provides a secure and weather protected place for bicyclists to park. These structures are typically located at park and ride facilities for transit stops or where bicyclists need to park their bike for longer than two hours. Long-term parking can be in the

form of lockers or bike racks that are in a secure area and protected from the weather.

Bicycle parking requirements depend on the type of land use. The Town of Indian Trail has adopted specific parking requirements that are based on various land use categories. These requirements can be found in Chapter 1020 – Off-Street Parking Requirements of the UDO.

5.10.2 *Signage*

Adequate signage and markings are essential on shared use paths, especially to alert bicyclists and motorists to potential conflicts regulatory messages at highway intersections. In addition, guide signing, such as to indicate directions, destinations, distances, route numbers and names of crossing streets, should be used in the same manner as on highways. In general, uniform application of traffic control devices, as described in the MUTCD, provides minimum traffic control measures which should be applied.[10]

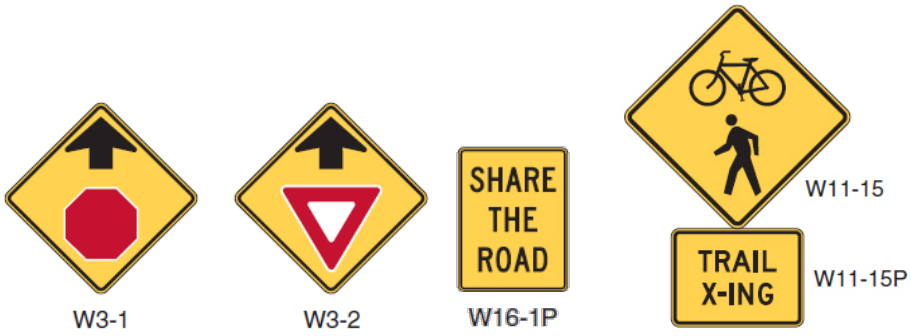
This section of the chapter provides an overview and some visual examples of the following types of signs: regulation, warning and directional/wayfinding. The MUTCD contains specific information on each sign; it is appropriate use and configuration.

In addition to signs, proper striping and pavement markings are used to delineate separation between the bicyclists and motorists. The correct use and placement of signs and striping/pavement markings is important to ensure the safety of motorists and cyclists.

- Regulatory Signs – Regulatory signs are used to provide all users with information regarding traffic laws. These signs are to be placed in locations where the regulations apply and the message shall clearly indicate the requirements imposed by the regulations and shall be visible and legible to bicyclists and motorists. The following examples are just a small sample of the regulatory signs that are provided by the MUTCD (Part 9 of the MUTCD 2009 Edition).

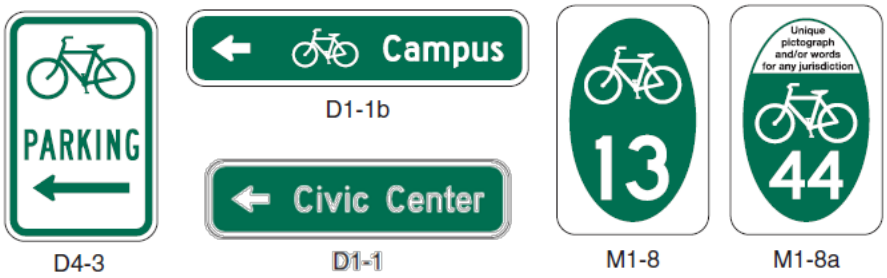
R3-17 R9-7 R10-22 R7-9

- Warning Signs – Are used to warn bicyclist and/or motorists of existing or potential hazardous conditions, such as an intersection, a narrowing of a path, or vertical clearance of an underpass. The following are examples of some of the warning signs that are detailed in Part 9 of the MUTCD 2009 edition.



W3-1 W3-2 W16-1P W11-15 W11-15P

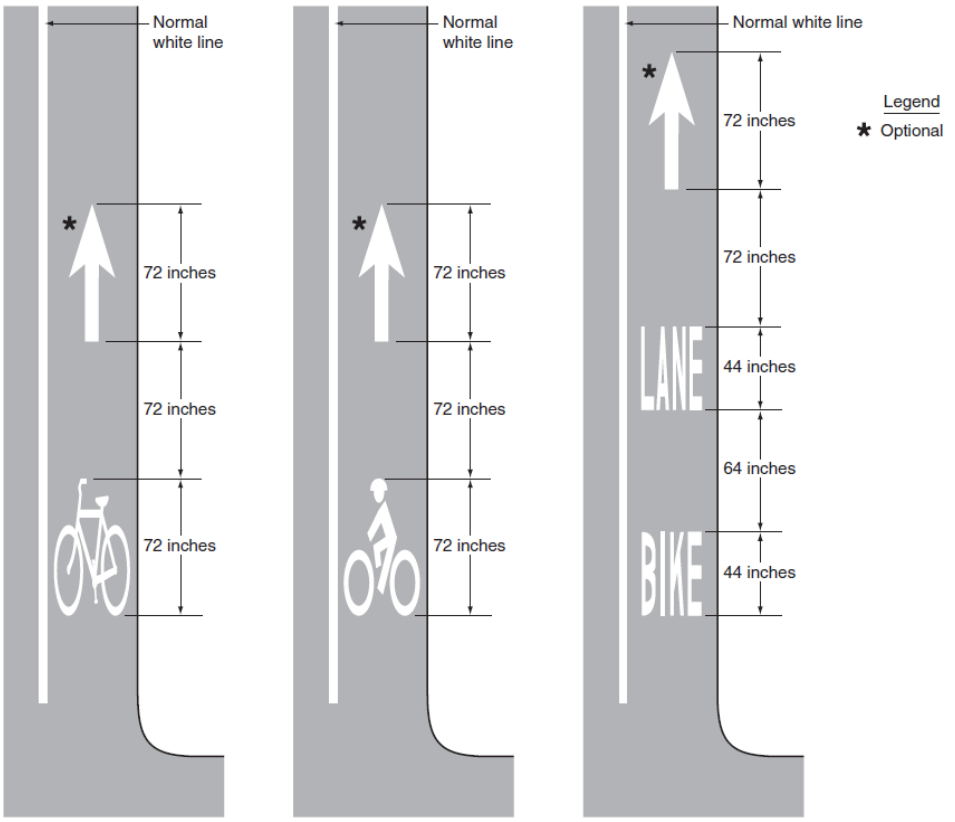
- Guide/Wayfinding Signs – One of the more critical components to a successful bicycle system is the use of guide or wayfinding signs. These types of signs provide bicyclist with information regarding the location of parking and changes in bike routes. Bicycle route signs that indicate a specific route should be coordinated with a bicycle route map so that users are aware of which route they need to take to access specific destinations. Since a large percentage of the Bicycle System that has been proposed in this plan is Neighborhood Signed Routes, a very well planned and designed wayfinding system needs to be established. Guide signs should be repeated at regular intervals so bicyclists know that they are traveling on an officially signed route. The following are just some examples from Part 9 of the MUTCD. Some signs (M1-8a shown below) can be adjusted to incorporate a municipality's logo.



D4-3 D1-1b D1-1 M1-8 M1-8a

5.10.3 *Striping and Pavement Markings*

Pavement markings and striping are needed to create separation between motorists and bicyclist and in some cases between pedestrians and bicyclist. For on-road facilities, such as bike lanes, there are various ways to mark the bike lane with symbols. Below are three examples that are detailed in the MUTCD.



A - Bike Symbol | B - Helmeted Bicyclist Symbol | C - Word Legends

Bike lane striping should consist of a 6-inch wide solid white line separating the bike lane from motor vehicle lane. The MUTCD has specific requirements for treatment of a bicycle lane at an intersection where there are heavy right turn movements. In some instances, colorizing the bike lane can be useful to increase the visibility to motorists. One of the main issues with this treatment is determining the appropriate color to use. This is an optional measure that the Town will need to evaluate on a case by

case basis, but typically should be reserved for use on major thoroughfares and roadways with high traffic volume and speeds.

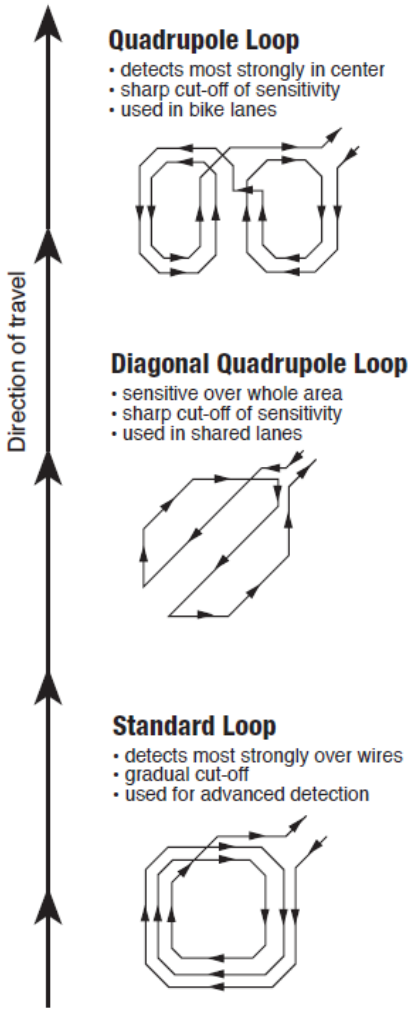
In addition to on-road facilities such as bike lanes, striping of multi-use paths should be considered in areas where there are high volumes of both pedestrians and bicyclists. Pavement markings and striping to separate the two users will create a safer environment and reduce the conflicts between them. For additional pavement striping and marking guidelines, please refer to Part 9 of the MUTCD.

5.10.4 *Signalization*

Cyclists should be considered in the timing of traffic signal cycles and in the choice of a traffic detection system. An average cyclist can cross an intersection under the same signal phasing arrangement as a motor vehicle. However, on multi-lane streets, clearance intervals should be long enough to allow bicyclists to cross.[11]

Detectors for traffic-actuated signals should be sensitive to bicycles and should be located in the expected path of the bicyclist. There are three types of preferred loop detectors as defined below. The image to the right has been provided to illustrate the differences between each. The image and the information below are from the North Carolina Bicycle Facilities Planning and Design Guideline.

- Quadrupole Loop – This loop detector works well where the path of the bicyclist is predictable, such as a bicycle lane or path.
- Diagonal Quadrupole Loop – This loop detector works best when the exact location of the bicycle cannot be easily predicted, especially in a shared roadway situation.
- Standard Loop – This is probably the least desirable of all three loop detectors for sensing bicycles. They are square or rectangular in shape and are most sensitive over the wires that form the outer boundary of the loop.



5.10.5 *Bicycle User Maps*

The development and distribution of bicycle maps is a high-benefit, low-cost tool that many municipalities utilize to educate the public about designated bicycle routes and/or the suitability of the existing transportation network for bicycling. There are several approaches to developing a bicycle map, each of which has a different purpose. Each type of map can be supplemented with safety tips, traffic laws, parking locations and other useful information.

- Bicycle Facility Locations – This type of map indicates routes that have been designated by the municipality as bike lanes, routes or paths. They are signed and striped to indicate bicycle travel.
- Bicycle Suitability Map – The suitability map merely identifies the difficulty of different segments of the road network for bicycling. This type of map can be useful for bicyclist wanting to avoid narrow, high-speed or high-volume streets.

In addition to the two type of maps listed above, some municipalities have create hybrid maps and individual route maps. Hybrid maps are a combination of the bicycle facilities map and suitability map. The individual route maps show specific loop routes or long distance routes. NCDOT has developed a program to assist municipalities in signing routes and creating maps. More information regarding this program can be obtained at the following web address: http://www.ncdot.gov/bikeped/projectdevelopment/signing_mapping/default.html.

5.10.6 *Maintenance*

Maintenance is a critical component of a bicycle system. Prior to the construction of a bicycle facility, the agency responsible for the control, maintenance and policing of the facility should be identified. The costs involved with maintaining and operating the facility should be carefully considered before moving forward with implementation. On-road facilities, such as bike lanes, are susceptible to having debris accumulate in the area near the right edge where most bicyclists are likely to ride. Therefore, regular sweeping is necessary to keep this area clear of debris.

In addition to debris, a smooth surface, free of potholes should be provided.[12] Chapter 9 of the North Carolina Bicycle Facilities Planning and Design Guidelines

provides a thorough review of maintenance and operation considerations for bicycle facilities. This includes surface repair, signing and traffic markings, lighting, site distance and clearance, drainage and other important aspects of a safe and efficient bicycle system.

Improper maintenance of these facilities can deter bicyclist from using them and could result in a lack of community support. Therefore, it is imperative that the Town develop a system for the proper operation and maintenance of future bicycle facilities.

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[1] North Carolina Bicycle Facilities Planning and Design Guidelines. North Carolina Department of Transportation, January 1994. Chapter 6: Bicycle Routes, pg. 39.
[2] Guide for the Development of Bicycle Facilities. American Association of State Highway and Transportation Officials, 1999. Chapter 2: Design, pg. 17.
[3] North Carolina Bicycle Facilities Planning and Design Guidelines. North Carolina Department of Transportation, January 1994. Chapter 5: Bicycle Lanes, pg. 31.
[4] Guide for the Development of Bicycle Facilities. American Association of State Highway and Transportation Officials, 1999. Chapter 2: Design, pg. 46.
[5] Guide for the Development of Bicycle Facilities. American Association of State Highway and Transportation Officials, 1999. Chapter 2: Design, pg. 48.
[6] North Carolina Bicycle Facilities Planning and Design Guidelines. North Carolina Department of Transportation, January 1994. Chapter 7: Bicycle Paths, pg. 54.
[7] North Carolina Bicycle Facilities Planning and Design Guidelines. North Carolina Department of Transportation, January 1994. Chapter 7: Bicycle Paths, pg. 55.
[8] Bicycle Parking Guidelines. Association of Pedestrian and Bicycle Professionals. Spring 2002.
[9] Bicycle Parking Guidelines 2nd Edition. A Set of Recommendations from the Association of Pedestrian and Bicycle Professionals (APBP), 2010.
[10] Guide for the Development of Bicycle Facilities. American Association of State Highway and Transportation Officials, 1999. Chapter 2: Design, pg. 53.
[11] North Carolina Bicycle Facilities Planning and Design Guidelines. North Carolina Department of Transportation, January 1994. Chapter 6: Bicycle Routes, pg. 20.
[12] North Carolina Bicycle Facilities Planning and Design Guidelines. North Carolina Department of Transportation, January 1994. Chapter 6: Bicycle Routes, pg. 63.

CHAPTER 6

Plan Implementation

Bike It

Indian Trail Bicycle Master Plan

Chapter 6:
Plan Implementation

6.1 Roles and Responsibilities

The successful implementation of the Bicycle Master Plan can only be realized through the collaboration of various partners. These partners include, but are not limited to:

- Town Council
- Town Planning Board
- Town Planning and Neighborhood Development Services
- Town Engineering and Public Works
- The Transportation Committee
- The Parks, Tree and Greenway Committee
- North Carolina Department of Transportation (NCDOT)
- Union County Sheriff's Office
- Developers
- Residents
- Advocacy Groups

Each of these partners will have a specific role in the implementation of the plan. The organizational chart on the following page provides a visual illustration of how the coordination will occur.

6.1.1 Town Council

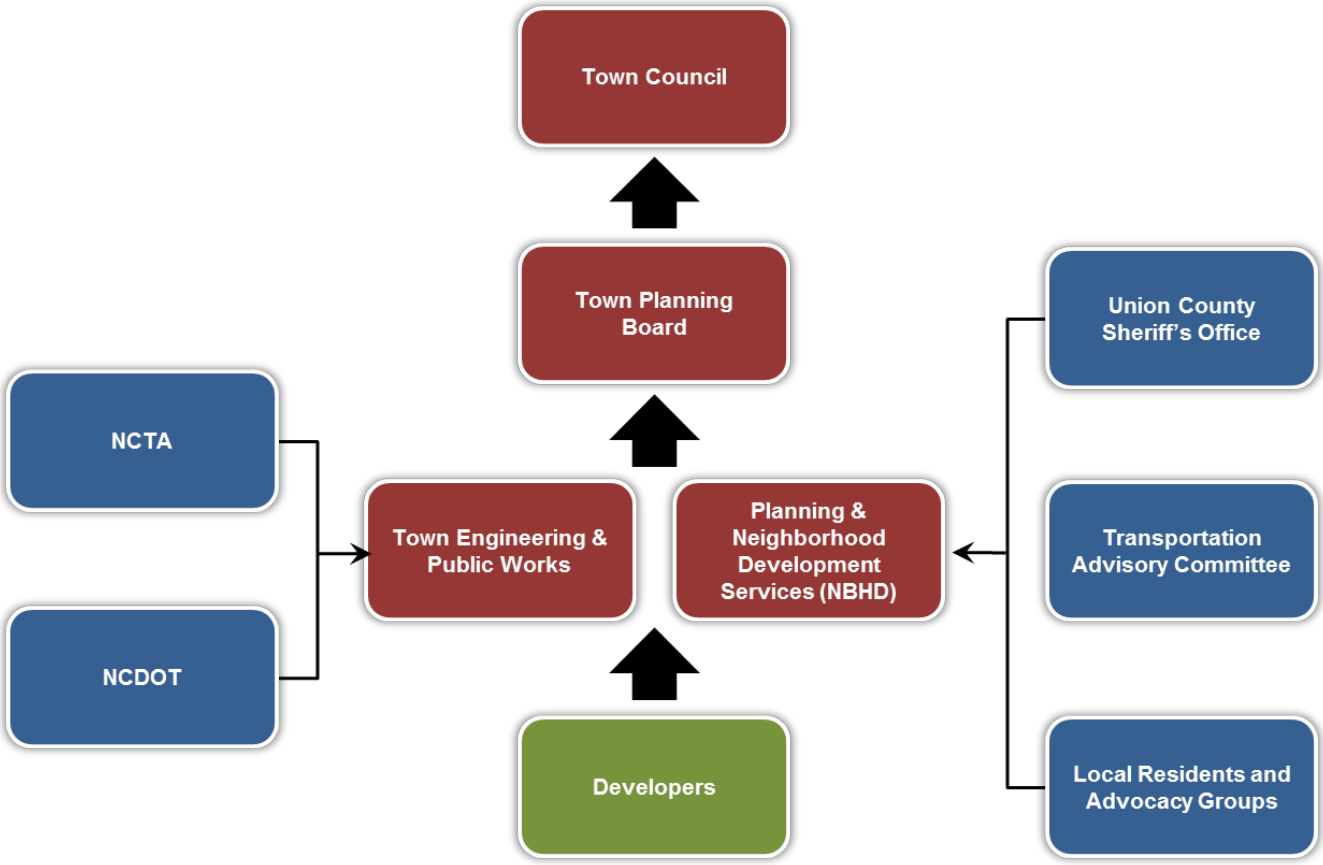
The Town Council will be responsible for ensuring that improving bicycle mobility throughout the community remains a priority. The first step in the process is the adoption of the plan. Through the adoption of this plan, the Town's leadership is recognizing the value of bicycle transportation and the benefit for the residents' quality of life.

- Approve ordinance updates and changes that will strengthen bicycle-related policies.
- Support the expenditure of local funding for the development and maintenance of bicycle facilities
- Support and encourage Town staff to obtain grants for the development of bicycle facilities.

6.1.2 Town Planning Board

The Town's Planning Board serves as an advisory board to the Town Council and provides recommendations on planning and zoning related matters. Therefore, the Planning Board will review any policy changes related to this plan. It will be crucial for the Planning Board to become familiar with the Bicycle Master Plan and be ready to support its recommendations.

Responsibilities Framework



6.1.3 Town Planning and Neighborhood Development (NBHD) Services

The NBHD will be the lead entity in charge of implementing the plan. This department will be responsible for the day-to-day coordination of the implementation of the plan. The following table provides an overview of the ongoing responsibilities of the NBHD.

Action/Responsibility
Continue to pursue grants to fund bicycle projects and programs.
Coordinate with NCDOT and the Town's Engineering and Public Works Department to ensure bicycle facilities are incorporated into resurfacing projects, new roadway and reconstruction projects.
Coordinate with private developers to ensure the incorporation of adopted bicycle improvement projects into their plans, especially bicycle parking and greenways.
Coordinate with Union County's Sheriff's Office on safety and education programs for the town. Continue to support and provide assistance with the Bicycle Rodeo Program.
Continue to coordinate with regional entities, such as Carolina Thread Trail, on the development of greenways and other bicycle facilities.
Meet with the Transportation Advisory Committee on a quarterly basis to update them on the progress of the plan and to facilitate discussions about their involvement.
Continue to coordinate with NCDOT and the North Carolina Turnpike Authority on future roadway/highway projects to ensure the inclusion of bicycle facilities in their plans.
Work with the Town to establish an annual bicycle event to celebrate biking and to announce the addition of any new bicycle facilities.
Coordinate with local advocacy groups, home owner associations and the Transportation Committee on the implementation of bicycle facilities and programs
Present policy changes and/or updates to the Planning Board and Town Council. Work with Council and the Planning Board on a local funding source for bicycle improvements.

6.1.4 Town Engineering and Public Works Department

The Engineering and Public Works Department will play a crucial role in the implementation of the bicycle facilities. Currently, they coordinate with the various permitting agencies (NCDOT, NCDENR, NCDWQ, ACOE, UCPW) to ensure compliance with local, state, and federal requirements.

They also work with NCDOT to develop the Town's Capital Improvement Plan (CIP) which identifies multi-modal capital improvements that are needed within the Town. CIP management responsibilities can include planning, design, design review, agency (internal and external) coordination, scheduling, construction administration, and facility maintenance. Both the Engineering and Public Works Department and NCDOT will need to become familiar with the recommendations within this plan to ensure that the bicycle projects are included in future CIP plans and future road widening and resurfacing projects.

They will be responsible for the construction and maintenance of the facilities on town-owned roadways. They will need to follow the standards and guidelines in order to meet the goals of the plan. Also, under the direction of the Parks and Recreation Department as recommended in the Parks and Greenway Plan, they will also be responsible for the construction and maintenance of any town-owned and maintained greenways. They should coordinate with the NBHD on restriping, new construction and reconstruction project to allow for sufficient review time.

Action/Responsibility
Continue to coordinate with permitting agencies to ensure compliance with local, state and federal requirements.
Meet with the NBHD on a regular basis to discuss potential bicycle projects and implementation strategies.
Continue to coordinate with NCDOT and the North Carolina Turnpike Authority on future roadway/highway projects to ensure the inclusion of bicycle facilities in their plans.
Update existing design standards to include the standards and guidelines outlined in Chapter 5.
Coordinate with the future Parks and Recreation Department on the development of greenways
Update existing street maintenance programs to include bicycle facilities

6.1.5 *Transportation Advisory Committee*

The Transportation Advisory Committee will be responsible for coordinating with the Town to implement the recommendations in this plan. Their support will be crucial during the implementation of the plan and they should coordinate and meet with the NBHD to:

- Evaluate the progress of the Plan
- Assist the Town during bicycle related events to promote bicycling within the community.
- Act as the liaison between the Town and the community
- Work with the Planning and Engineering Departments to continue to look for opportunities for bicycle connectivity.

6.1.6 *Union County Sheriff's Office*

The Union County Sheriff's Office currently works with municipalities across Union County to educate the community about bicycle safety. They currently have a bicycle rodeo program that teaches children and adults basic bicycle safety, such as:

- How to correctly wear a helmet
- How to properly signal
- How to ride in a straight line
- How to avoid obstacles

The Sheriff's Office is a great resource and the Town should continue to forge a partnership to assist in educating both cyclists and motorists. The Sheriff's Office should be prepared to:

- Assist the Town in understanding and enforcing bicycle-related laws in North Carolina
- Enforce all laws (bicycle and motorist) to increase bicycle safety. These include, but are not limited to speeding, aggressive driving, running red lights, no turning on red, etc.
- Continue to provide educational opportunities through the Bicycle Rodeo Program.
- Provide an opportunity for users to call in and report traffic violations or harassing behavior, as well as reporting collisions. This can be done through an online tool or a hotline.

- Continue to patrol the community to ensure safety of greenways and trails and to work with the Town on identifying opportunities for connectivity.

6.1.7 Developers

Developers can play an important role in the development of bicycle facilities, whether those facilities are on-road or off-road. Currently there are opportunities within the existing residential subdivisions to stripe and sign bike lanes on the major routes through the subdivisions. As new development occurs, developers should work closely with the Town and be prepared to do the following:

- Developers should become familiar with the benefits of providing bicycle related amenities, such as bike lanes and greenways.
- Developers should also become familiar with the Facility Standards and Guidelines that are outlined in Chapter 5.
- Finally, developers will participate in the implementation of the plan through compliance with the Unified Development Ordinance, especially sections 350.130, 960.010, 960.020, 1010.020A, 1030.010, 1030.20A-C, 1070 (F)(2), 1110.060 (D)(1), 1160.010 (A) and 1160.060.

6.1.8 Local Residents and Advocacy Groups

Perhaps one of the most important groups is the users of the actual bicycle facilities. The residents of the town and the advocacy and education groups, such as Trips for Kids, Tarheel Trailblazers and Charlotte Area Bicycle Association, will play a crucial role in the implementation of this plan. These groups must continue to stay involved and be prepared to do the following:

- Attend Town Council and Planning Board meetings where bicycle related issues are being discussed to emphasize the importance of bicycle safety and improvements.
- Volunteer to assist at bicycle related events and to gather support amongst friends, family and neighbors.
- Continue to look for opportunities for partnerships and improving bicycle connectivity.

6.1.9 North Carolina Turnpike Authority (NCTA)

As mentioned in Chapter 3, the North Carolina Turnpike Authority is currently planning and designing the Monroe Connector/Bypass. It is a proposed toll highway that will extend from the interchange of US 74 and I-485 in Mecklenburg County to an area between the Towns of Wingate and Marshville

in Union County. The project will have a major impact on vehicular and bicycle mobility. The leadership from Indian Trail should continue to work with the NCTA to ensure that the toll road does not create a barrier within the town, and that bicycle facilities are factored into the design of the roadway, bridges and the access roads.

6.1.10 North Carolina Department of Transportation (NCDOT)

NCDOT owns and operates many major thoroughfares within the Town and should continue to work closely with the Town to construct and maintain bicycle facilities. NCDOT should encourage the Town to adopt the State's policy to create "Complete Streets" as their own. NCDOT has made strides to begin incorporating bicycle facilities in roadway projects across the state, and the Town of Indian Trail should be no exception. NCDOT should be prepared to do the following:

- Endorse the Town's Bicycle Master Plan and commit to assist in the implementation of the plan, especially on all state maintained roads.
- Work with the Town on future repaving and restriping projects, and provide sufficient time for coordination with the Town staff.
- Provide guidance on bicycle related design issues, such as bike lanes, and wide shoulders.

The Town should continue to partner with NCDOT to identify areas of issue and work on solutions to improve bicycle mobility and safety.

6.2 Prioritization of Projects

The System Plan Map that was described in Chapter 4 provides an illustration of all the proposed projects for this Bicycle Master Plan. As mentioned in Chapter 3, there are several neighborhood loops, town-wide connectors and neighborhood connectors. When combined, these connections create a bicycle system that will eventually facilitate bicycle movement throughout the town. There are 18 neighborhood loops, 12 town-wide connectors and approximately 7 neighborhood connectors. Each neighborhood loop and town-wide connector is comprised of several segments or projects. There are approximately 71 neighborhood loop projects, 42 town-wide connector projects and 7 neighborhood connector projects, totaling 120 projects. These projects range from signed routes, striped bike lanes and greenway connections.

The Town will not be able to construct all of these projects at one time primarily due to funding. Therefore, it is important for the Town to have some implementation strategies and prioritization for construction. This will provide the Town's decision makers with guidance on budgeting for capital projects, the

formulation of work plans, and the pursuit of grants and other funding mechanisms. To prioritize the 120 projects a methodology was developed that included the assessment of each project against a variety of criteria. The list of criteria was initially developed by reviewing the goals from previous plans. The list was then reviewed by the Steering Committee and ultimately validated by the public through the public workshops. Each criterion was then assigned a numeric value based on the priorities of the community and input from the Town staff and the Steering Committee. Next, each project was compared against the criteria and assigned points. The projects received a total score based on the assigned point values. Each project was then placed into one of three implementation categories based on the total score, these include: Short-Term (1-3 years), Mid-Term (3-10 years) and Long-Term (over 10 years). The criteria and the associated point values are listed in Table 6.1. Table 6.2 on the following page illustrates how the numeric values are tied to the implementation categories.

Table 6.1: Prioritization Criteria

Criteria	Point Value
Downtown District Proximity (within Downtown District Only)	3
Village Center Proximity (within Village Center Overlay only)	3
Existing Institutional Proximity (1 mile radius)	3
Existing Greenway Proximity (1 mile radius)	3
Existing Park/Recreation Proximity (1 mile radius)	3
Connects Existing Infrastructure	3
Direct Connection to Regional Destination	2
Existing Transit Stop Proximity (1 mile radius)	2
Existing Mixed-Use Proximity (1 mile radius)	2
Existing Major Retail/Commercial Proximity (1 mile radius)	2
Future/Proposed Greenway Proximity (1 mile radius)	2
Neighborhood-to-Neighborhood Connection	2
Existing Non-Retail Major Employment Proximity (1 mile radius)	1
Future Park Proximity (1 mile radius)	1
Direct Connection to Carolina Thread Trail	1
Total Possible Raw Score	**33**

Table 6.2: Implementation Categories

Priority	Point Range
Short-Term Priority Projects	67 – 100
Mid-Term Priority Projects	34 – 66
Long-Term Priority Projects	0 – 33

The total score that any one segment could receive was 33. In order to create a 100 point scale, the total possible score of 33 was normalized or multiplied by a factor of 3.03

The list of criteria and the implementation categories were developed to provide the Town with a foundation to begin making decisions on bicycle improvements. Therefore, just because a project scored high based on the criteria and is listed as a Short-Term priority, doesn't necessarily mean that it will be the first project built. There will be many other factors that will need to be considered to decide when a project gets built. Some of those factors include, but are not limited to:

- Land ownership
- Funding
- Community Input
- Scheduled Roadway Improvements
- Location in Town Quadrants

Town staff will consider these factors and use professional judgment to determine which projects will be implemented first. Town staff realizes the importance of treating all segments of each neighborhood loop as a whole project and will work with each neighborhood to implement the projects in a timely manner.

6.3 Bicycle Matrix

Based on the criteria, input from the Town staff, the Steering Committee and the general public, a list of projects were developed and categorized by Neighborhood Loop, Town-Wide Connectors and Neighborhood Connectors. To distribute the projects equitably throughout the town, four quadrants were delineated (see Figure 6.1). The projects were then divided into these four quadrants and then prioritized to provide the Town the ability to implement

projects equitably throughout the town. The intent of dividing the projects into four quadrants is to select one project from each part of the community to begin implementing immediately. These projects are referred to as Pilot Projects and will be discussed in more detail later in this chapter. The organization of all the projects can be seen in the Bicycle Matrix in Appendix C.

6.4 Implementation Matrix

The Implementation Matrix (Appendix E) provides a series of action steps or tasks associated with the implementation of this plan. These action steps have been organized by the following categories:

- Planning
- Funding
- Construction
- Maintenance
- Education
- Coordination

Under each category are tasks that are critical to the implementation of the recommendations in this plan. These tasks have been broken down into scheduled priorities based on the following: Immediate (1-3 years), Short-Term (3-5 years), Mid-Term (5-10 years), Long-Term (over 10 years) and On-Going. In addition to assigning timeframes to the tasks, the Implementation Matrix provides guidance for the Lead agency/entity and the Supporting agency/entity. This matrix should be used to track the completion of each task.

6.5 Pilot Projects

The following section provides an overview of the pilot projects for the Town to implement over the next 1-3 years. The projects were chosen as a combination of the prioritization exercise as well as input from the Steering Committee and the public. To provide each area of the town with a project, the town was divided into four quadrants (see Figure 6.1). A total of four projects were selected and a site visit was completed for each to take measurements and understand the physical conditions. Listed below is a description of each project, while a project cut sheet illustrating the improvements can be found in Appendix F.

6.5.1 Idlewild Village Center Connector

This pilot project is a combination of several bicycle improvement projects listed in the project matrix. The Idlewild Village Center Connector, which is located in Quadrant #1, is composed of three parts which are described in detail below.

- Signed Bicycle Routes: The first part of the project includes the signing of existing residential streets for a Neighborhood Signed Bicycle Route. The streets to be signed are Crismark Drive, Red Lantern Road and Clearwater Drive. Signing these roads will safely facilitate cyclists along neighborhood streets with low traffic volumes and speeds and keep them off of Mill Grove Road, which is a major thoroughfare that has no bicycle amenities and is not suitable for bicycle travel.
- Clearwater Connection: This part of the project will improve an existing connection behind the Food Lion which is located in the Idlewild Commons Shopping Center at the end of Clearwater Drive. The current connection includes a gravel path that facilitates pedestrians over the landscaped berm. This connection does not meet current ADA standards. This path needs to be upgraded to create a connection that is suitable for all users. Potential improvements could include:
  - Retaining wall to facilitate users through the berm
  - 8-10 foot wide concrete or asphalt path
  - Pedestrian lighting
  - Handicap accessible ramps
  - Landscaping.

  The recommended improvements create a short-term solution to a connection that does not currently meet the needs of all users.
- Red Lantern Connector: Currently, Red Lantern Road terminates without a connection to Crismark Drive. A site visit confirmed that individuals are cutting through the vegetation to walk and/or bike from Red Lantern Road to Crismark Drive. Improvements would facilitate pedestrians and bicyclists more safely through this area. The improvements should include at a minimum:
  - An asphalt or concrete path that is 8-10 feet wide
  - Removable bollards at both ends of the walkway to prevent motorists from driving through the area
  - A stop sign and stop bar should be installed on the Crismark side of the walkway to remind bicyclists to stop and look before entering the roadway

- Pedestrian lighting should also be considered to improve the visibility and safety of the users

6.5.2 Bonterra/Poplin Elementary School (E.S.) Connection

The Bonterra/Poplin E.S. Connection, which is located in Quadrant #2, includes the improvement of the intersection of Bonterra Boulevard and the driveway for Poplin Elementary School. Throughout the development of this plan, citizens voiced their concern over the inability to safely cross Poplin Road from the Bonterra residential subdivision to the school. Currently, there are no painted crosswalks or signage to alert motorists of this crossing. The Town has met with NCDOT and others regarding this intersection with everyone agreeing improvements are needed. Improvements to this intersection include:

- Improvements to the existing concrete medians on the Bonterra side of Poplin Road
- High visibility thermoplastic crosswalk markings
- Warning signs using high intensity sheeting must be placed upstream from and at the crossing
- Pole mounted flashers must be placed at the crossing, to be manually actuated by pedestrians. The pole must be breakaway or yielding.

6.5.3 Sun Valley High School (H.S.) Connection

This pilot project is an improvement to an existing mid-block crossing on Wesley Chapel Road adjacent to Sun Valley High School. The mid-block crossing is located south of the intersection of Old Monroe Road and Wesley Chapel Road (Quadrant #3). Concerns over the safety of pedestrians and cyclists have been voiced over several years regarding this crossing. Large volumes of children have been reported crossing at this location, and the current treatment for this crossing is insufficient. Currently there is a high visibility crosswalk, sidewalks on both sides of the road and crossing warning signs. Motorists turning right from Old Monroe Road onto Wesley Chapel Road have very little time to react to the crossing since it is located so close to the intersection.

Improvements should include at a minimum:

- Construction of an angled concrete median between the two travel lanes to provide a refuge for users
- New high visibility thermoplastic crosswalk markings
- Warning signs using high intensity sheeting must be placed upstream from and at the crossing

- Pole mounted flashers must be placed at the crossing, to be manually actuated by pedestrians. The pole must be breakaway or yielding.

6.5.4 Brandon Oaks Parkway Bike Lane

The fourth pilot project, located in Quadrant #4, is the restriping of Brandon Oaks Parkway to include bicycle lanes. Brandon Oaks Parkway is approximately 32-33 feet wide from Carlisle Drive to Farmingham Lane. Brandon Oaks Parkway should be restriped from Carlisle Drive to Farmingham Lane to include:

- (2) 10-foot wide travel lanes
- (2) 5-foot bike lanes. The striping that separates the bike lanes from the travel lanes should be 10-inches wide.
- Consider painting the bike lanes red to increase the visibility.
- The roadway narrows on the remaining sections, therefore, the remainder of the bike route will need to be signed "Share the Road."
- Bike Route signage and bike lane markings within the bike lanes

6.6 Summary

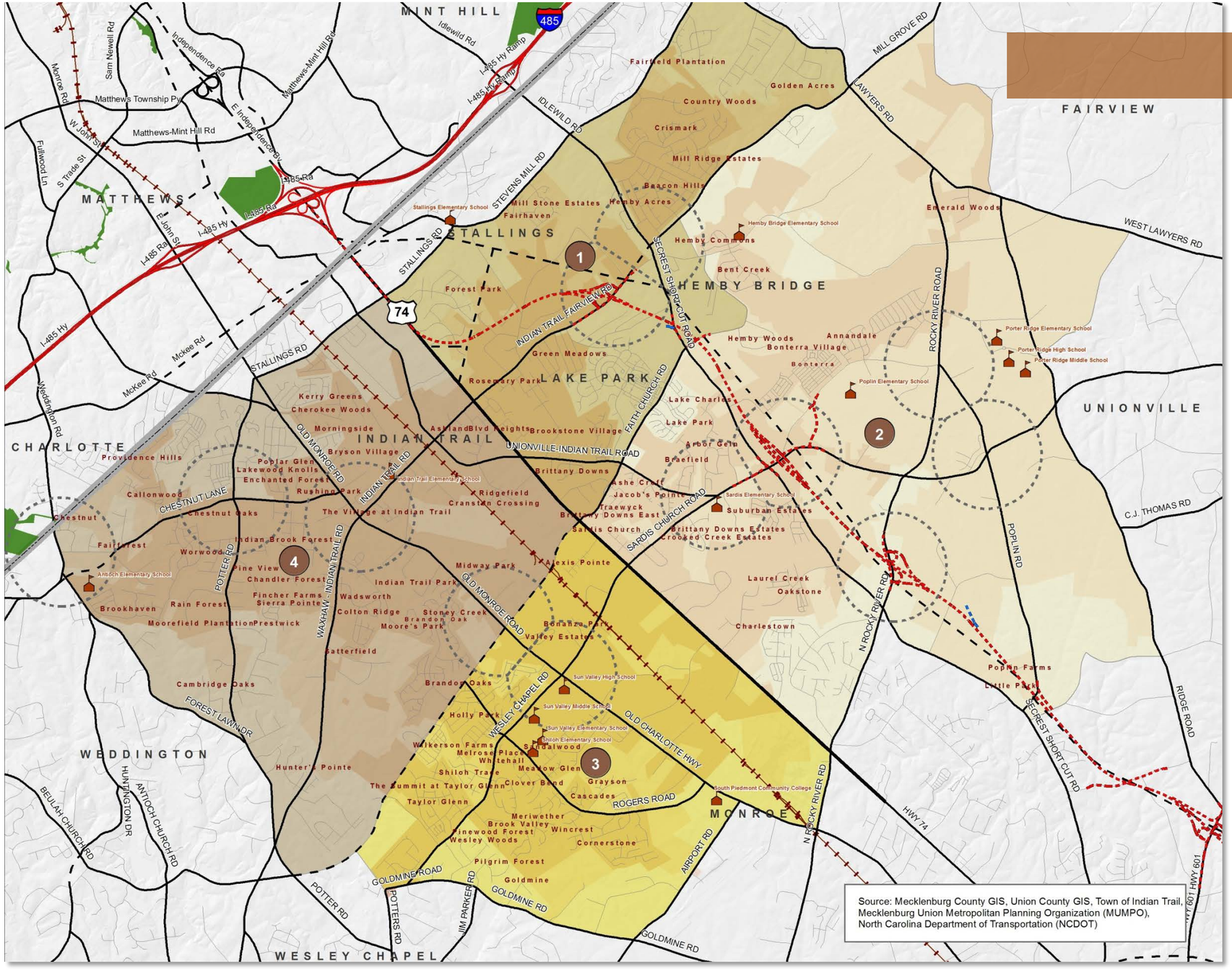
This plan has identified many bicycle improvement projects as well as safety and education programs that will be implemented over the next several decades. This chapter has provided an overview of the coordination that must take place between the agencies and groups of individuals in order to implement those projects and programs. The Town should continually assess the effectiveness of the coordination and make adjustments where necessary. The pilot projects that have been chosen are intended to illustrate to the community not only the commitment of the Town to improve bicycle mobility, but to serve as a precedent for future projects.

Finally, bicycle infrastructure within Indian Trail may be limited today, but with the commitment of the elected officials and the support of the community, improvements can be made and Indian Trail will be a bicycle friendly community in the future.

Bike It

Indian Trail Bicycle Master Plan

Figure 6.1: Quadrant Map



Legend

- Schools
- Village Center Overlay
- Mecklenburg County Parks
- County Boundary
- Monroe Bypass Alternatives
- Interstates
- MUMPO Thoroughfare (Existing)
- MUMPO Thoroughfare (Proposed)
- Union County Roads
- Railroads
- Indian Trail
- Planning Area

Bike It

Indian Trail Bicycle Master Plan

APPENDICES

Appendix A: Comprehensive Plan Recommended Road Typologies

Appendix B: Questionnaire Results

Appendix C: Bicycle Matrix

Appendix D: Neighborhood Loops

Appendix E: Implementation Matrix

Appendix F: Pilot Projects

Appendix G: Funding Sources

Appendix H: Terminology

Bike It

Indian Trail Bicycle Master Plan

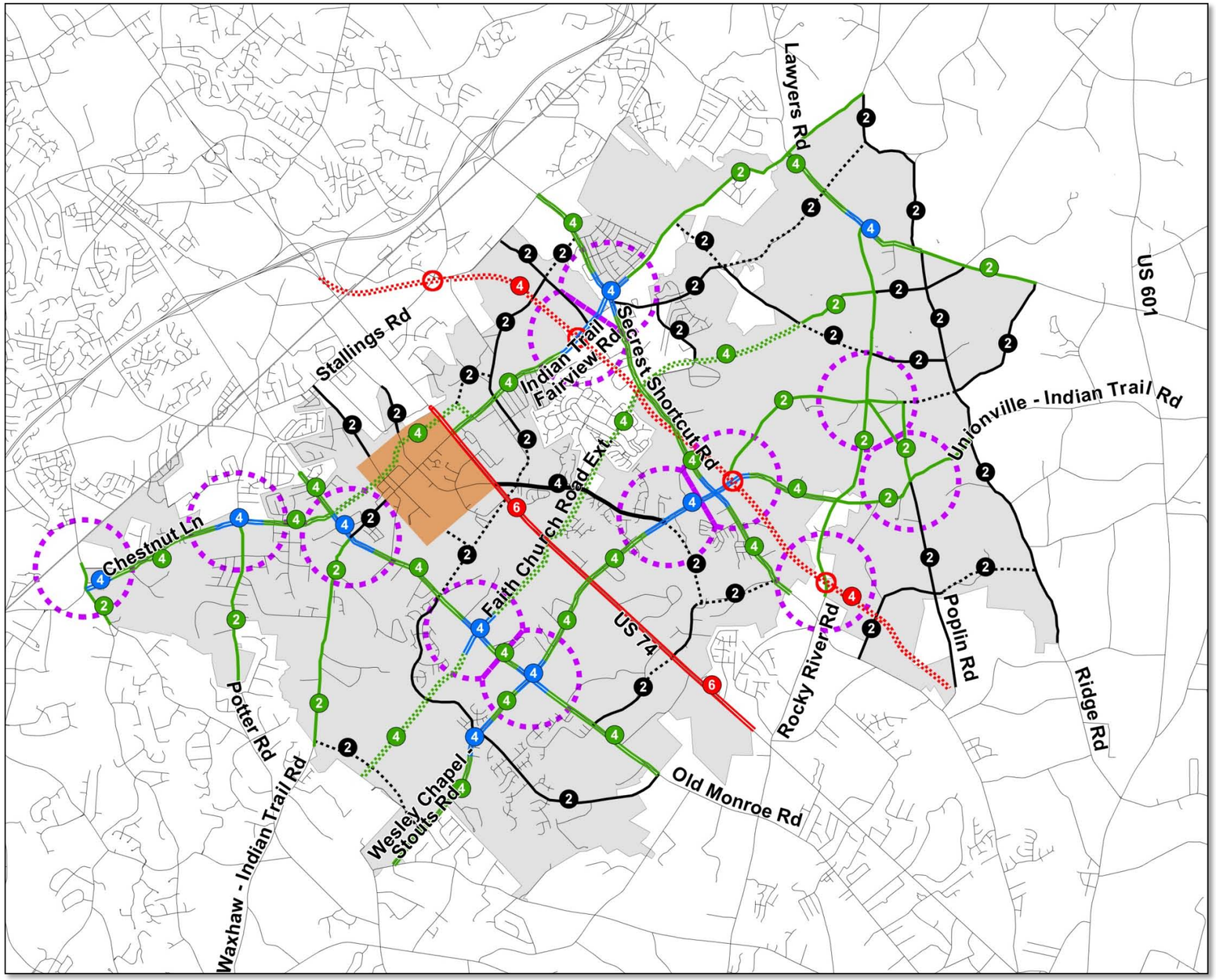
APPENDIX A

Comprehensive Plan Recommended Road Typologies

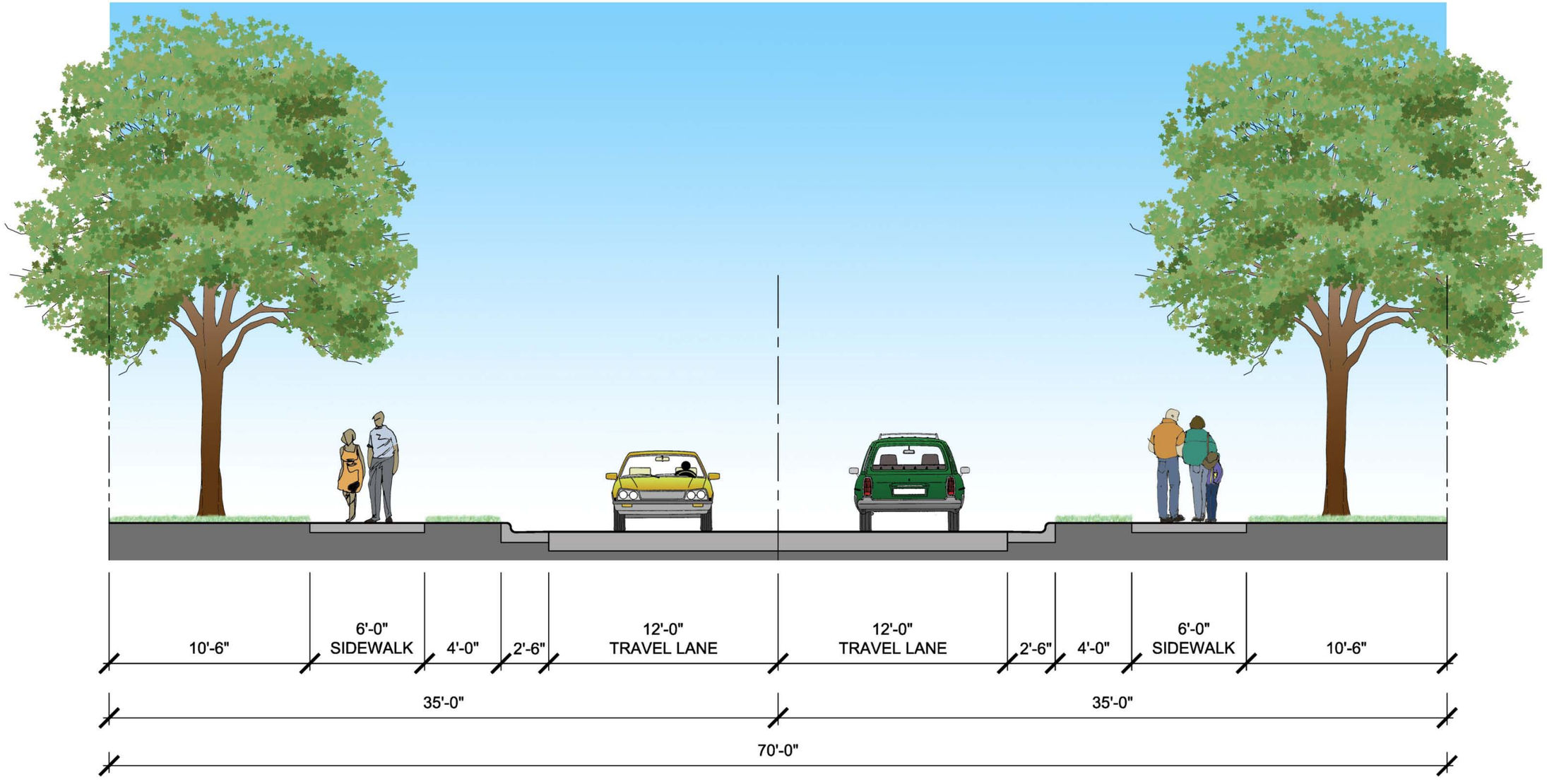
Bike It

Indian Trail Bicycle Master Plan

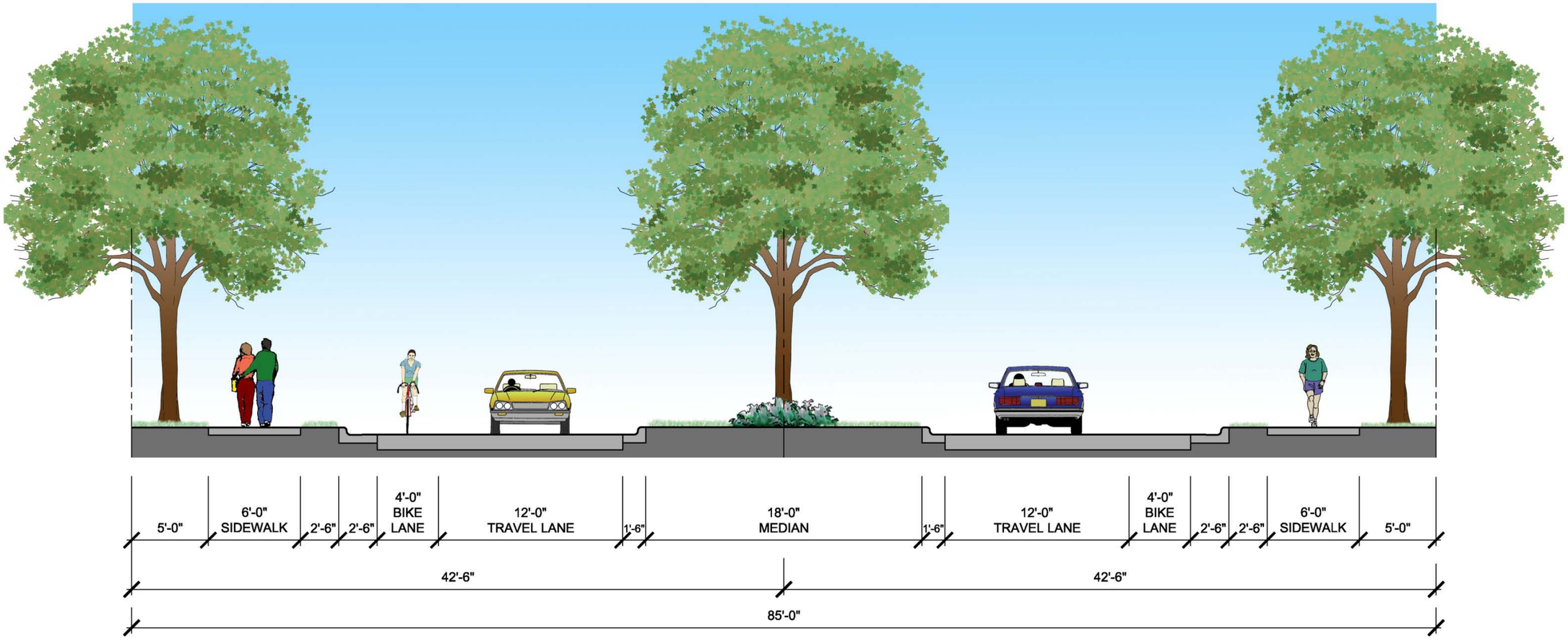
Proposed Roadway Network (Comprehensive Plan)



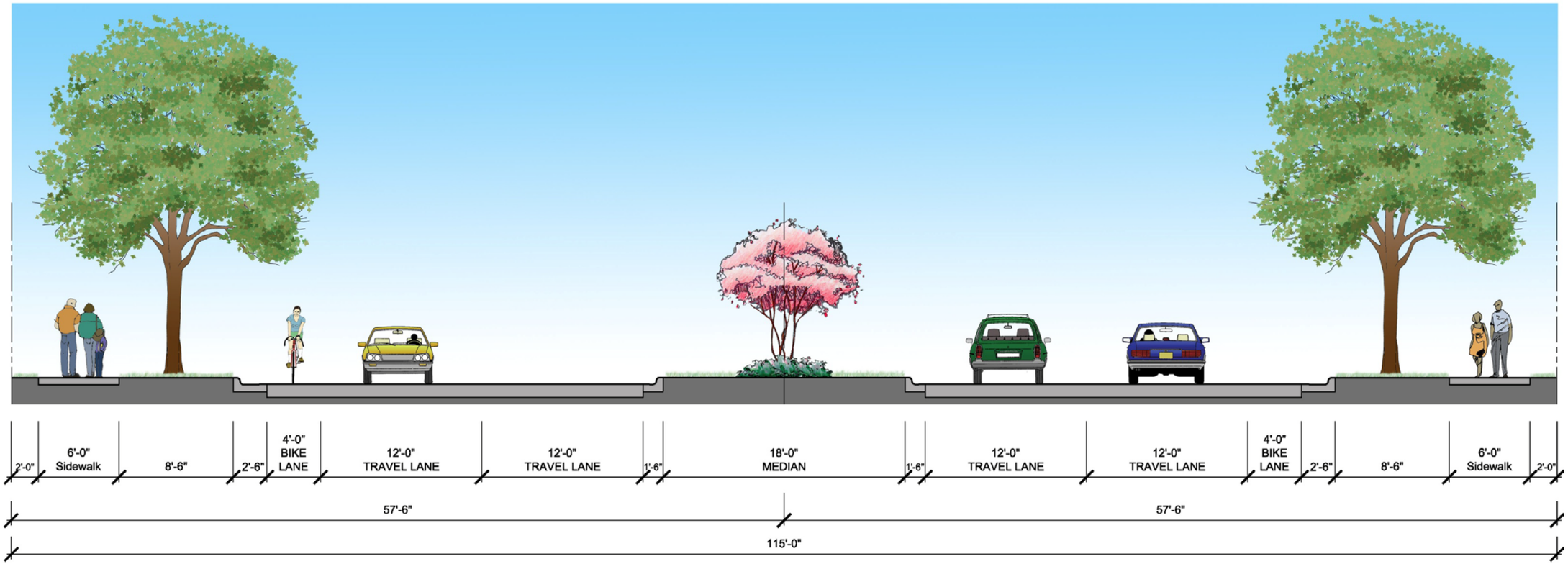
- 2-Lane Thoroughfare (Existing Alignment)
- 2-Lane Thoroughfare (New Alignment)
- 4-Lane Village Center Boulevard
- 2-Lane Boulevard (Existing Alignment)
- 4-Lane Thoroughfare (Existing Alignment)
- 4-Lane Boulevard (Existing Alignment)
- 4-Lane Boulevard (New Alignment)
- 6-Lane Boulevard (Existing Alignment)
- 4-Lane Freeway
- Freeway Interchange
- Village Center
- Downtown
- Planning Area



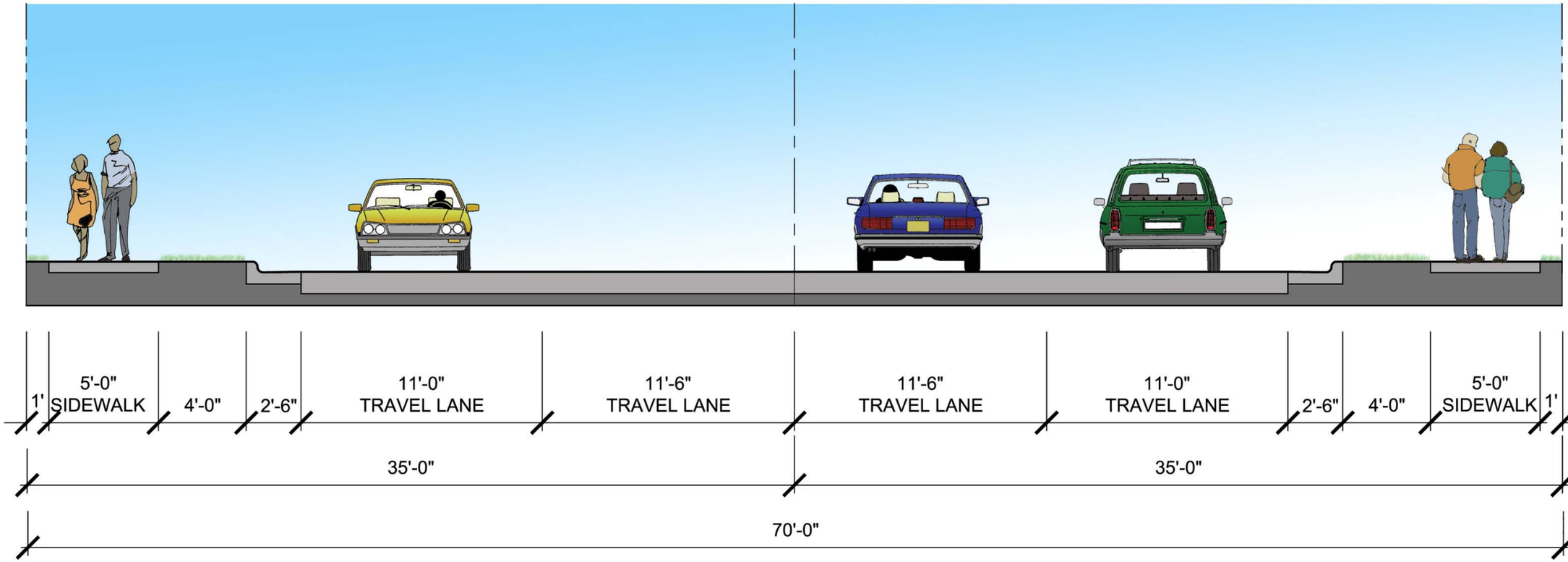
Two Lane Thoroughfare Cross Section



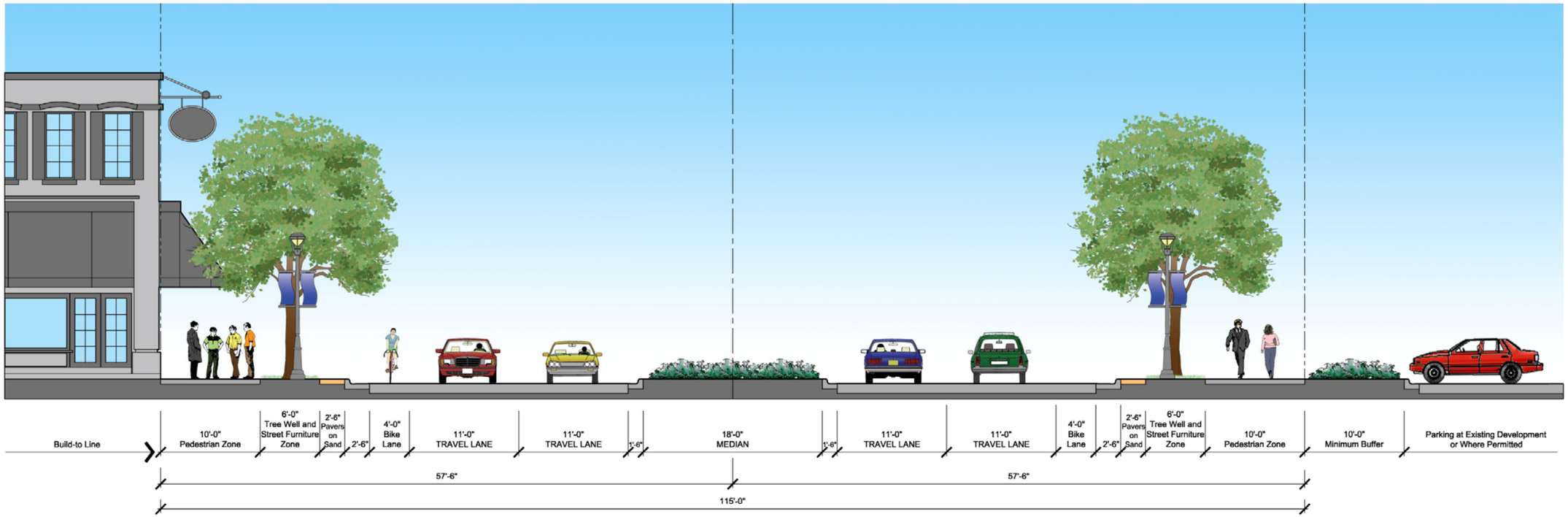
Two Lane Boulevard Cross Section



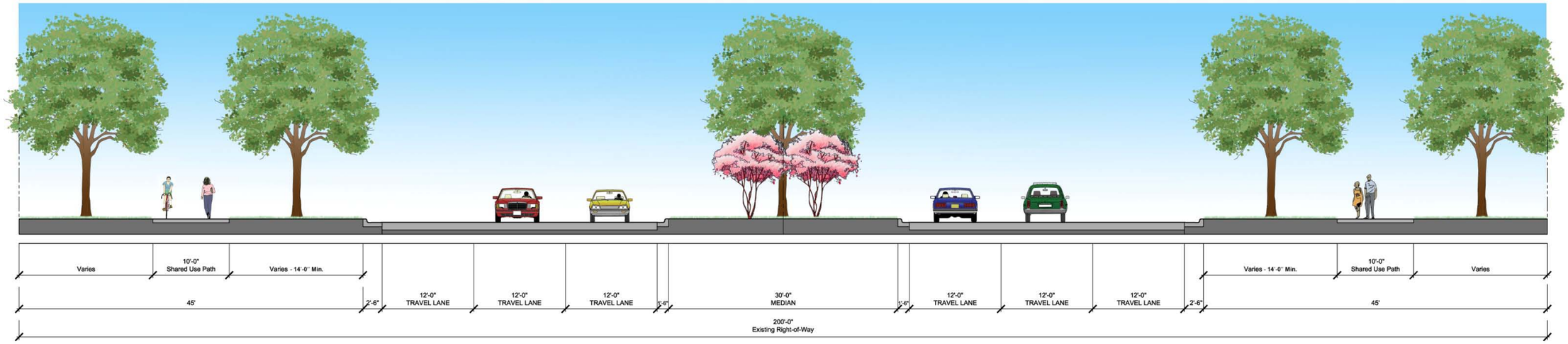
Four Lane Boulevard Cross Section

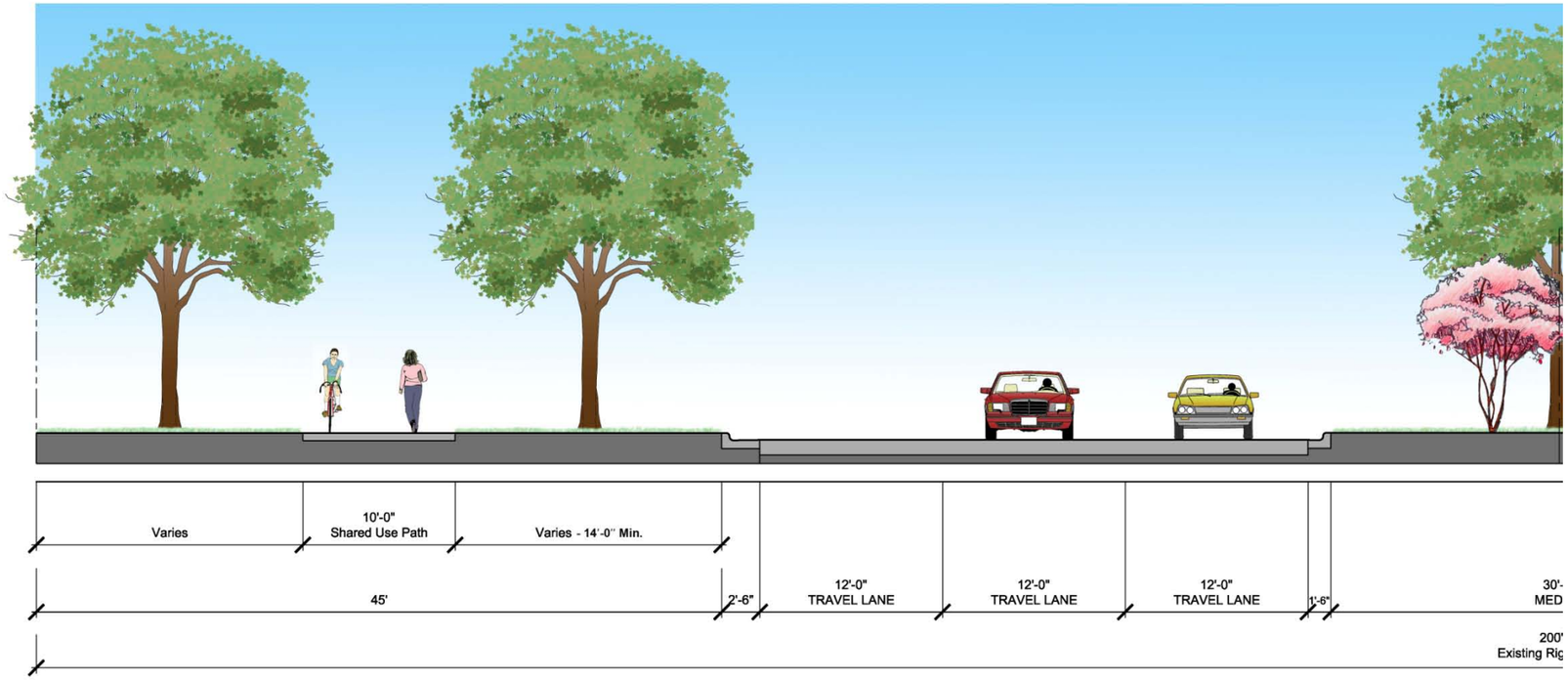


Four Lane Thoroughfare Cross Section



Four Lane Village Center Boulevard Cross Section





Six Lane Boulevard Cross Section (note the 10-foot wide shared use path)

Bike It

Indian Trail Bicycle Master Plan

APPENDIX B

Questionnaire Results

Bike It

Indian Trail Bicycle Master Plan

1. What is your age?

	Response Percent	Response Count
Under 18	2.1%	2
18-25	2.1%	2
26-45	70.5%	67
46-64	23.2%	22
Over 65	2.1%	2
answered question		95
skipped question		0

2. Are you a resident of Indian Trial?

	Response Percent	Response Count
Yes	74.7%	71
No	25.3%	24
If not, where do you live?		23
answered question		95
skipped question		0

3. How often do you bike?

	Response Percent	Response Count
Daily	17.4%	16
Weekly	**39.1%**	**36**
Monthly	15.2%	14
2-4 times each year	20.7%	19
Not at all	7.6%	7
Other (please specify)		5
answered question		**92**
skipped question		**3**

4. If you ride, how long are your rides?

	Response Percent	Response Count
Most are under 20 minutes	6.9%	6
21-30 minutes	27.6%	24
31- 60 minutes	**34.5%**	**30**
More than an hour	29.9%	26
Half day or longer	1.1%	1
Other (please specify)		4
answered question		**87**
skipped question		**8**

5. If you bike, what is your purpose (check all that apply)?

	Response Percent	Response Count
Exercise	92.2%	83
Transportation	25.6%	23
Work related	10.0%	9
Errands	21.1%	19
Visiting friends	14.4%	13
Recreational/Leisure	81.1%	73
Other (please specify)		3
answered question		90
skipped question		5

6. Where do you most often ride? (check all that apply)

	Response Percent	Response Count
Trails	52.9%	46
Bike lanes, when available	35.6%	31
Neighborhood streets only	65.5%	57
Between towns or cross state	17.2%	15
Off ride mountain bicycling	36.8%	32
Other (please specify)		3
answered question		87
skipped question		8

7. Who do you ride with? (check all that apply)

	Response Percent	Response Count
Mostly I ride alone	51.1%	46
Family	**62.2%**	**56**
Friends	36.7%	33
Organizations and events	13.3%	12
Other (please specify)		0
answered question		**90**
skipped question		**5**

8. If it were easy to bike around Indian Trail, where would you bike to? (check all that apply)

	Response Percent	Response Count
• Coffee shop	59.1%	52
• Grocery store	68.2%	60
Bookstore	46.6%	41
Park or Greenway	**94.3%**	**83**
School	30.7%	27
Post Office, library or other civic place	61.4%	54
Festivals or other events to avoid parking	75.0%	66
Other (please specify)		7
answered question		**88**
skipped question		**7**

9. Do you know of any areas where people have worn paths or formed pedestrian/bicycle connections that the Town could improve?

	Response Count
	26
answered question	26
skipped question	69

10. Is there any particular improvement of any sort that you would like to see made or where facilities are needed?

	Response Count
	35
answered question	35
skipped question	60

11. How satisfied are you with the Town's current bicycle infrastructure?

	Response Percent	Response Count
Very Satisfied	3.4%	3
Somewhat Satisfied	6.8%	6
Not Satisfied	**68.2%**	**60**
Not sure	21.6%	19
Comments		11
answered question		88
skipped question		7

12. Are there any connections that you would like to see that connects neighborhood streets with a trail?

	Response Count
	34
answered question	34
skipped question	61

13. What do you see as the Town's greatest strength in terms of bikeability?

	Response Count
	41
answered question	41
skipped question	54

14. What do you see as the Town's greatest weakness in terms of bikeability? (check all that apply)

	Response Percent	Response Count
Traffic volume	59.5%	47
Traffic speed	58.2%	46
Personal security	40.5%	32
Not enough people riding	44.3%	35
Other (please specify)		24
answered question		79
skipped question		16

15. Do you feel that the Town's bicycle infrastructure promotes safety?

	Response Percent	Response Count
Yes	18.4%	16
No	**81.6%**	**71**
	answered question	**87**
	skipped question	**8**

16. What types of bicycle facilities do you feel comfortable riding on? (check all that apply)

	Response Percent	Response Count
Mixed with motor traffic with separated lanes	54.3%	50
Mixed with motor traffic without separated lanes	13.0%	12
Separated multi-use trails	69.6%	64
Trails/greenways	**90.2%**	**83**
Neighborhood streets	76.1%	70
	Other (please specify)	2
	answered question	**92**
	skipped question	**3**

17. What would encourage you to bike more?	
	Response Count
	58
answered question	58
skipped question	37

18. Additional Comments:	
	Response Count
	29
answered question	29
skipped question	66

2. Are you a resident of Indian Trial?

	If not, where do you live?	
1	Matthews/Weddington	May 3, 2010 8:48 PM
2	Miami	May 4, 2010 2:28 PM
3	Matthews	May 13, 2010 12:24 AM
4	Weddington	May 13, 2010 4:19 PM
5	Cotswold	May 14, 2010 2:14 PM
6	Lake Park	Jun 4, 2010 9:16 PM
7	just outside of Indian Trail, in the Myers Meadows subdivision	Jun 11, 2010 12:15 AM
8	charlotte	Jun 15, 2010 2:24 PM
9	monroe	Jun 16, 2010 6:13 PM
10	Charlotte	Jun 23, 2010 3:00 PM
11	hemby bridge	Jul 20, 2010 11:51 AM
12	Monroe	Aug 19, 2010 1:42 AM
13	charlotte	Sep 21, 2010 5:47 AM
14	charlotte	Oct 10, 2010 10:59 AM
15	Raleigh	Oct 12, 2010 1:46 PM
16	ohio	Oct 14, 2010 4:58 AM
17	Concord	Oct 23, 2010 2:00 PM
18	Weddington	Oct 23, 2010 2:33 PM
19	Albemarle, NC	Oct 23, 2010 2:37 PM
20	columbia,sc	Oct 23, 2010 3:41 PM

2. Are you a resident of Indian Trial?

	If not, where do you live?	
21	Port Townsend, Washington	Oct 23, 2010 3:49 PM
22	Concord	Oct 23, 2010 4:02 PM
23	Wingate	Oct 23, 2010 5:51 PM

3. How often do you bike?

	Other (please specify)	
1	3-4 times weekly	May 4, 2010 2:28 PM
2	my kids bike and I run/walk with them	May 13, 2010 11:47 AM
3	2-3 times a week	May 14, 2010 2:14 PM
4	Would bike more if I had better access to paths	May 17, 2010 1:06 AM
5	I am looking forward to start along with my wife and kids.	Jun 5, 2010 3:05 PM

4. If you ride, how long are your rides?

	Other (please specify)	
1	I would ride longer if there was a safe place to do so	Jun 15, 2010 12:27 PM
2	20-40	Oct 14, 2010 4:58 AM
3	n/a	Oct 18, 2010 12:43 PM
4	I do not own a bike	Oct 23, 2010 2:37 PM

5. If you bike, what is your purpose (check all that apply)?

	Other (please specify)	
1	Racing	Jun 14, 2010 2:04 PM
2	car-free	Oct 10, 2010 10:59 AM
3	n/a	Oct 18, 2010 12:43 PM

6. Where do you most often ride? (check all that apply)

	Other (please specify)	
1	Streets... you selection are not logical	Jun 3, 2010 8:14 PM
2	stationary	Jun 16, 2010 6:13 PM
3	I utilize neighborhoods as cut-throughs to maximize safety.	Jun 18, 2010 11:52 AM

8. If it were easy to bike around Indian Trail, where would you bike to? (check all

	Other (please specify)	
1	City Streets	May 12, 2010 8:16 PM
2	Basically everywhere as long as the bike lane is properly demarked as such and wide enough to maneuever properly and defensively.	Jun 5, 2010 3:05 PM
3	No other place	Jun 15, 2010 12:41 AM
4	work	Jun 15, 2010 6:14 PM
5	Job	Jun 18, 2010 11:52 AM
6	Friends homes, restaurants for lunch, Bruesters	Jun 23, 2010 3:00 PM
7	Friends house	Oct 23, 2010 4:59 PM

9. Do you know of any areas where people have worn paths or formed

	Response Text	
1	Along Indian Trail Fairview Road past NE of the Extreme Ice Arena.	May 7, 2010 3:04 PM
2	Brookhaven neighborhood to Harris Teeter grocery store on Potter/Chestnut	May 13, 2010 3:19 AM
3	At the end of the path in Brookhaven that goes towards Antioch Elementary School	May 17, 2010 2:29 AM
4	Yes. Along Antioch Church Rd from where the Antoich elementary ends up to the corner of Weddington Rd. Also-Walking/bike path from Brookhaven to Antioch Elementary. Current trail ends at neighborhood like and a path is worn into the school, but steep hills prevent the easy passage of bikes onto school property.	May 17, 2010 9:36 PM
5	There are path in Brandon Oaks near the powerlines. This, with improvements, can be a great excise trail.	Jun 2, 2010 12:19 PM
6	I mostly ride on the road, and most have a very small shoulders and holes	Jun 3, 2010 4:46 PM
7	no	Jun 3, 2010 5:41 PM
8	no	Jun 4, 2010 1:05 AM
9	From the subdivision of Brookhaven to the new Harris teeter.	Jun 4, 2010 1:23 AM
10	No	Jun 4, 2010 1:28 AM
11	no	Jun 4, 2010 5:10 PM
12	none	Jun 4, 2010 11:44 PM
13	Not that I am aware of. Unfortunately unless I stay in my neighborhood (Brandon Oaks), I don't bicycle around due to no sidewalks. I usually take my bike to trails/greenways outside Indian Trail. For example McAlpine, University, Cane Creek Park, etc	Jun 12, 2010 5:04 PM
14	I am unacquainted with any pedestrian connections.	Jun 14, 2010 2:04 PM
15	Rogers Road there limited sidewalks and Monroe Road from Harris Teeter to the Food Lion no safe place to walk/bike ride.	Jun 15, 2010 10:54 AM
16	There are natural walking trails currently established in Brandon Oaks and also in Arbor Glen. Arbor Glen could use improvements. These trails could be paved liked the Sun Valley H.S. / Middle School trail in order to enable bike use.	Jun 15, 2010 1:46 PM
17	no	Jun 15, 2010 6:14 PM
18	Wesley Chapel Rd right after Shiloh Trace heading towards Wesley Chapel. Its extremly dangerous right on that turn in the road almost hit a biker.	Jun 16, 2010 2:49 PM

9. Do you know of any areas where people have worn paths or formed

	Response Text	
19	Yes. Where sidewalks end. Examples: Potter Road between the roundabout at Wahaw-Indian Trail Rd. and Old Monroe Rd.	Jun 18, 2010 11:52 AM
20	Along Old Monroe b/w Brandon Oaks and intersection of IT/Fairview & Old Monroe	Jun 22, 2010 10:45 PM
21	Behind the Indian Trail Elementary School there are some dirt trails that run along the creek.	Jun 23, 2010 3:00 PM
22	between beacons hills 2 and crismark	Jun 27, 2010 1:34 PM
23	there is an easement that runs beside our house on southfork rd. there are a couple of trails that go to the ball park, but none that are clear and established other than cross through. also the trail that the high school uses that goes into grayson subdivision on rogers rd. that could be improved on and made safe.	Jul 7, 2010 6:46 PM
24	Between Lake Park and Brookstone Village.	Oct 12, 2010 1:46 PM
25	Dont know if this is Indian Trail or not, but Chestnut needs a sidewalk between Brookhaven subdivision and the Harris Teeter plaza on the corner or Chestnut and Stallings	Oct 23, 2010 2:33 PM
26	I am not aware of any at this time, but I do know that there is a lot of land in behind our home at Crooked Creek Estates and a bike lane there would be great.	Oct 23, 2010 4:59 PM

10. Is there any particular improvement of any sort that you would like to see

	Response Text	
1	We need safe paved paths to connect us to our town. I have pushed off the road by on coming cars, yelled at, honked at you name it just trying to go to the grocery store or get some exercise. I would like to see a separate paved bike path that connects and runs through Indian Trail. I would really LOVE a separate path for walkers and runners and a second path for bikers and skaters or just one wide path that accomodates all.	May 4, 2010 1:54 PM
2	I would like to see bike lanes on the road so people can use their bikes to run errands or get to work if they live close enough to work. I would LOVE to see bike paths in greenways that allow people to go at least 5 miles.	May 7, 2010 3:04 PM
3	Paths along Chestnut or a way to SAFELY connect us to Beatty Park	May 12, 2010 8:52 PM
4	Paved areas with no car access. Trail that connects subdivisions and gets to main street shopping without chance of getting hit.	May 13, 2010 1:52 AM
5	A separate, paved and motorless path or greenway is essential; there is no room for cyclists on the roads now and their use of the roads holds up traffic and endangers them. Also, paths that connect neighborhoods to each other and to schools and libraries or town establishments would be ideal.	May 13, 2010 2:28 AM
6	Same as above	May 13, 2010 3:19 AM
7	smooth, motorless, paved paths	May 13, 2010 11:47 AM
8	Our neighborhood, Brookhaven, would benefit so much from paths connecting us to Beattie Park, McKee shopping area, Potter Road, Indian Trail town center...So many families would use such a path.	May 17, 2010 1:06 AM
9	I'd like to see a bike lane or path parallel to Chestnut Ln	May 17, 2010 9:36 PM
10	There are no facilities that I know of in Indian Trail!	Jun 2, 2010 12:19 PM
11	bike lanes on the roads	Jun 3, 2010 3:37 PM
12	Currently there is no where for me to ride in Indian Trail.... any improvements would be welcomed	Jun 3, 2010 5:41 PM

10. Is there any particular improvement of any sort that you would like to see

	Response Text	
13	I would love to see any bike lanes/trails/paths added in the area. I commute to work as well as ride for recreation and find the streets are too conjested & narrow and drivers are sometimes hostile.	Jun 3, 2010 10:09 PM
14	Either sidewalks or bike lanes so be put in so bicyclist do not have to ride in the street with a chance of being hit. The land where the powerlines run through Brandon Oaks subdivision upto Old Monroe Rd abd across would be a good place for a "Greenway" or off road mountain biking trails.	Jun 4, 2010 1:03 AM
15	More Trails.	Jun 4, 2010 1:28 AM
16	widen road shoulders and/or bike lanes	Jun 4, 2010 4:49 PM
17	more bike/walking trails in general to avoid busy streets	Jun 4, 2010 5:10 PM
18	I would love a sidewalk/bike lane between the subdivisions on Sardis Church Road and Sardis Elementary. I would also be interested in one continuing up Unionville-Indian Trail to Wal-Mart or from Sardis Elementary to the Food Lion plaza on 74.	Jun 4, 2010 11:44 PM
19	Similar to the above comment, I'd love to see all roads, specially states ones, with bike lanes properly demarcated as such and wide enough to maneuver properly and defensively.	Jun 5, 2010 3:05 PM
20	Bike lanes are needed. Bike "boxes" at intersections.	Jun 11, 2010 12:15 AM
21	Just the main roads need sidewalks for biking. Trying to ride a bike on Old Monroe Rd/ Old Charlotte Highway is a death wish. No thanks. I usually ride in my neighborhood but that is usually too short.	Jun 12, 2010 5:04 PM
22	None in particular.	Jun 14, 2010 2:04 PM
23	Have decent bike trails. I know it might be too much to ask for but since I'm from the Netherlands/Holland, we have RED Asfalt and bike trails, can this be done here? Bike traffice (warning) Lights/ cross overs. Small hill like instead of just a white stripe on the road as marker for where its a bike road or not..	Jun 15, 2010 3:25 AM
24	More sidewalks!!!! So kids can enjoy more than just their neighborhoods and can safely get from one place to another. Better crossing paths to go across streets.	Jun 15, 2010 10:54 AM
25	To make it safe to ride on roads in Union County, the roads would need to be widened	Jun 15, 2010 12:27 PM
26	It would be nice if there was a local park that incorporated trails that would allow bikes and skateboards as well as joggers/walkers. Perhaps something similar to McAlpine.	Jun 15, 2010 1:46 PM
27	no	Jun 15, 2010 6:14 PM
28	More bike lanes on our roads	Jun 16, 2010 2:13 PM
29	I would like to see more sidewalks. Like 'Field of Dreams', 'if you build it, they will come'. It would be nice to connect neighborhoods to shopping centers and town center via sidewalks, greenways, and bike lanes. People would get more exercise and health care costs would plummet.	Jun 18, 2010 11:52 AM
30	Bike racks at local businesses. Bike lanes from intersection of IT/Fairview & Old Monroe to Sun Valley shopping center, from Sun Valley to US 74, and from intersection of IT/Fairview & Old Monroe out to 74 near Post Office.	Jun 22, 2010 10:45 PM
31	I think we really need to have bike lanes along Old Monroe Rd. It links so many neighborhoods to shopping centers and other neighborhoods, not to mention Stallings and Matthews. Also, having bike lanes or wider shoulders on Indian Trail Rd. would be nice.	Jun 23, 2010 3:00 PM
32	Bike lanes are needed. Most of the roads have little or no shoulders and some drivers are very ignorant/inconsiderate to bikers.	Jun 26, 2010 5:12 PM
33	bike park where people can go and bike	Jun 27, 2010 1:34 PM

10. Is there any particular improvement of any sort that you would like to see

	Response Text	
34	Facilities and a greenway similar to that of Statesville NC. They have a great greenway that ties in soccer fields and businesses; if it hasn't been looked at in comparison it should.	Oct 12, 2010 1:46 PM
35	walk ways, improved sidewalks, walking paths	Oct 23, 2010 5:51 PM

11. How satisfied are you with the Town's current bicycle infrastructure?

	Comments	
1	If they exist I am not sure where they are.	May 7, 2010 3:04 PM
2	would like bike lanes or maybe a better shoulder	Jun 3, 2010 4:46 PM
3	I didn't know we had one.	Jun 4, 2010 1:28 AM
4	Most communites are bicycle friendly	Jun 10, 2010 12:37 PM
5	You mention a bicycle infrastructure....I am not aware of one that exist.	Jun 12, 2010 5:04 PM
6	From what I've seen, there isn't much infrastructure in the first place. Maybe I'm wrong, but the only "infrastructure" I've seen is sidewalks.	Jun 14, 2010 2:04 PM
7	I don't bike now because there are no safe options.	Jun 15, 2010 1:57 PM
8	There are no bike lanes and you have to walk in ditches to get anywhere from most neighborhoods.	Jun 18, 2010 11:52 AM
9	B/c its basically a free-for-all- with no established routes- currently as far as where to ride (safely), but with a bike plan I think I could be VERY SATISFIED	Jun 22, 2010 10:45 PM
10	Aside from a couple of bike racks there is no bicycle infrastructure in Indian Trail.	Jun 23, 2010 3:00 PM
11	At the moment there isn't any bicycle specific infrastructure. Portland OR pretty much has the best real working infrastructure. Indian Trail planners should be looking to this for guidance and ideas. On a smaller scale though; without saying.	Oct 12, 2010 1:46 PM

12. Are there any connections that you would like to see that connects

	Response Text	
1	Chestnut to old monroe Old Monroe south past Sun Valley	May 4, 2010 1:54 PM
2	I am not familiar enough with this, but I do believe if their were bike trails that connected to the schools and the ITAA fields, people could choose to use them and reduce the traffic congestion that is experienced now due to the lack of biking trails	May 7, 2010 3:04 PM
3	chestnut lane needs a path- dangerous for bikers especially with harris teeters opening- more car traffic	May 12, 2010 8:14 PM
4	Colton Ridge/ Pioneer Ln and Brandon Oaks	May 12, 2010 8:16 PM
5	Chestnut lane to new shopping areas. A path that crosses over on Weddington Matthews road. There are not enough sidewalks to connect safety and a path to get to the Siskey Y and shopping there.	May 13, 2010 1:52 AM
6	Yes! A path that connects neighborhoods to each other and to a designated biking trail would be ideal.	May 13, 2010 2:28 AM
7	Brookhaven to Beatty Park	May 13, 2010 3:19 AM

12. Are there any connections that you would like to see that connects

	Response Text	
8	Chestnut Lane or Antioch Church Rd.	May 13, 2010 11:47 AM
9	Our neighborhood, Brookhaven, would benefit so much from paths connecting us to Beattie Park, McKee shopping area, Potter Road, Indian Trail town center...So many families would use such a path.	May 17, 2010 1:06 AM
10	Need a bike path along Chestnut road to enable people in various subdivisions, including Brookhaven, to ride their bikes towards Indian Trail (at a minimum to the new Harris Teeter, Walgreens, etc.). Would also help to have a bike path that went all the way into downtown Indian Trail, including the library. Also need a path going to Francis Beatty Park, though I'm assuming only part of the way along Chestnut would be considered within the boundaries of Indian Trail.	May 17, 2010 2:29 AM
11	I don't even know of any trails so it is difficult to say. The only trail I know of are built by neighborhoods.	May 17, 2010 9:36 PM
12	Why not connect all neighborhoods with bike paths. I would suggest creating a bike path along the Railroad tracks to connect neighborhoods with down town Indian Trail. Or a light rail.	Jun 2, 2010 12:19 PM
13	I dont know of any	Jun 3, 2010 5:41 PM
14	It would be nice to have connections to Francis Beatty park. There are plenty of neighborhoods that could be linked to provide relatively safe access. Many neighborhood streets that are "dead-ends" for cars could be joined with minimal effort and funding to provide bike/foot access.	Jun 3, 2010 10:09 PM
15	Yes, as mentioned in question #10 about Brandon Oaks subdivsion. The power lines fields that run through there.	Jun 4, 2010 1:03 AM
16	all of them	Jun 4, 2010 1:05 AM
17	See above	Jun 4, 2010 11:44 PM
18	Brittany Downs East & West	Jun 5, 2010 3:05 PM
19	Lake Park, Brookstone Village	Jun 6, 2010 10:52 PM
20	connect to the surronding towns so any paths length could be extended	Jun 7, 2010 4:33 PM
21	I wish there was trail built all around Indian trail. It could be paved or loose gravel. Have a complete loop.It could go thru the back of neighborhoods for entry/exit points. There greenway trail in Univercity area (Mallard Creek) has many points of entry via neighborhoods.	Jun 12, 2010 5:04 PM
22	None of the top of my head.	Jun 14, 2010 2:04 PM
23	sure, anywhere and everywhere! Would be so nice to be able to bike n a forrest like enviroment / trail every where, to connect communities with bike/walking trails everywhere!	Jun 15, 2010 3:25 AM
24	Taylor Glenn does not have any trail whatsoever so it would be nice to see some kind of bike path created that would allow connection with neighboring community trails.	Jun 15, 2010 1:46 PM
25	yes	Jun 15, 2010 6:14 PM
26	What trails?	Jun 16, 2010 2:13 PM
27	What trail? For a town called 'Indian TRAIL', I know of no trails.	Jun 18, 2010 11:52 AM
28	A trail connecting Sun Valley/Brandon Oaks with Austin Village would be nice	Jun 22, 2010 10:45 PM
29	Once we begin to develop some greenways we should definetly optimize any opportunities there may be to link neighborhood streets to these trails. This will be a good way to improve bike connectivity in suburban-style subdivisions rampant with cul de sacs and very poor street connectivity.	Jun 23, 2010 3:00 PM
30	I would like there to be sidewalks/bike lanes that would enable me to get from Brandon Oaks to Col. Francis Beatty Park safely	Jun 28, 2010 2:30 PM

12. Are there any connections that you would like to see that connects

	Response Text	
31	when riding trails betweern Boonterra and Bent Creek not sure who's land I am on and truely if I am allowed to ride.	Jul 20, 2010 11:51 AM
32	See No.10	Oct 12, 2010 1:46 PM
33	shopping centers	Oct 23, 2010 2:00 PM
34	We live in Crooked Creek Estates and it would be nice to have trails in behind our neighborhood.	Oct 23, 2010 4:59 PM

13. What do you see as the Town's greatest strength in terms of bikeability?

	Response Text	
1	Long flat straight aways	May 4, 2010 1:54 PM
2	The fact that there are large neighborhoods all around and there is a library, school, althletic fields and shopping in close enough proximity to be connected by safe bike paths and lanes.	May 7, 2010 3:04 PM
3	There are some streets wide enough for a bike lane	May 12, 2010 8:52 PM
4	The beauty of nature in our town and the open neighborhood streets.	May 13, 2010 2:28 AM
5	On the whole, it's a smaller town with little traffic and not many paths to begin with.	May 13, 2010 11:47 AM
6	Opportunity for Growth	May 17, 2010 1:06 AM
7	I can't get there with my bike, so it's really hard to talk about strengths. If we have to put our bikes in the car to ride to a trail, that's not the best option. Connecting paths to our subdivision would be the best solution. Second best would be to have enough of a bike path infrastructure (away from the roads and cars) that it would draw us to Indian Trail to ride our bikes, even if we have to load them in/on the car to do so	May 17, 2010 2:29 AM
8	narrow	May 17, 2010 9:36 PM
9	The town's greatest strength is the close proximity from neighborhoods to town center.	Jun 2, 2010 12:19 PM
10	no bike lanes	Jun 3, 2010 3:37 PM
11	truthfully I don't know of many I feel as though I am dodging cars and dogs daily but love it way to much to stop all together	Jun 3, 2010 4:46 PM
12	Right now, none	Jun 3, 2010 5:41 PM
13	not many	Jun 3, 2010 8:14 PM
14	Available space to place off road trails, which are much safer.	Jun 3, 2010 8:26 PM
15	There is plenty of potential and the town if a blank slate when it comes to bicycle transportation.	Jun 3, 2010 10:09 PM
16	Not enough biking areas that are safe from traffic.	Jun 4, 2010 1:03 AM
17	it doesnt have any yet	Jun 4, 2010 1:05 AM
18	Lots of wooded areas that be great for some trails.	Jun 4, 2010 1:28 AM
19	There are great sidewalks to ride on in town.	Jun 5, 2010 1:17 PM
20	Panoramic view. Green areas.	Jun 5, 2010 3:05 PM
21	rural	Jun 7, 2010 4:33 PM
22	I don't see Indian Trail as having bikeability. Some private communities within the town are fine for this. Maybe if we had a large park such a Beatty.	Jun 10, 2010 12:37 PM

13. What do you see as the Town's greatest strength in terms of bikeability?

	Response Text	
23	With the abundance of families, I think everyone has safety in mind. I think you would get a huge following and support if it were asked for. I for one, would do what I could to help support a good bike system (trail) for our town.	Jun 12, 2010 5:04 PM
24	The Town covers a small area, so people are more likely to use bicycles for transportation. If the town were larger, distance could be an issue and people would most likely rely on	Jun 14, 2010 2:04 PM
25	Should be enough space to advance space for bike trail / space / path's	Jun 15, 2010 3:25 AM
26	The greatest strengthtis the inner connectivity between many of it's neighborhoods. If neighborhood bike paths could be created including bike lanes, then connectivity would already be established.	Jun 15, 2010 1:46 PM
27	stay green	Jun 15, 2010 6:14 PM
28	distance from neighborhoods to commercial spaces is relatively short.	Jun 16, 2010 2:13 PM
29	Children can walk/bike to other houses without getting hit by a car.	Jun 16, 2010 2:49 PM
30	It is practically unbikable. There are many neighborhoods to ride your bike around in, but if you want to go somewhere you have to risk your life in heavy motor vehicle traffic on main throughways or high speed traffic on rural/side roads.	Jun 18, 2010 11:52 AM
31	Flat and areas that people would want to go (retail, dining, government, etc) are relatively close to each other	Jun 22, 2010 10:45 PM
32	Well, I think it is going to be a real challenge trying to make Indian Trail a bike-friendly town, but I think that we have a very enthusiastic and dedicated steering committee and as long as we keep them, and the general public at large, genuinely involved throughout the process of developing the bike plan, we may be able to overcome the cultural inertia of our dependence on the automobile and hopefully someday see more people on bikes here.	Jun 23, 2010 3:00 PM
33	That usually the traffic is not too heavy.	Jun 26, 2010 5:12 PM
34	There are a decent amount of sidewalks around town	Jun 28, 2010 2:30 PM
35	an open-minded planning department	Jul 7, 2010 6:46 PM
36	Still relatively small and undeveloped with opportunity to grow with bicycle transportation in mind.	Oct 12, 2010 1:46 PM
37	Once you get away from Independence blvd. the traffic is nearly non-existent and the traffic speeds are decreased which favors bicycle travel.	Oct 12, 2010 1:46 PM
38	at least you are planning for bikes and recognize the need for bike facilities	Oct 23, 2010 2:00 PM
39	not much traffic yet, open spaces	Oct 23, 2010 2:33 PM
40	Lots of open space and potential	Oct 23, 2010 3:49 PM
41	There are a lot of neighborhoods in close proximity to one another. It would be great to have bike trails or greenways that connected these neighborhoods.	Oct 23, 2010 4:59 PM

14. What do you see as the Town's greatest weakness in terms of bikeability?

	Other (please specify)	
1	no safe place	May 4, 2010 1:54 PM
2	Lack of trails and sidewalks.	May 13, 2010 1:52 AM
3	Access to trails from neighborhoods	May 13, 2010 6:10 PM
4	Lack of paths away from automobile traffic) connecting things	May 17, 2010 1:06 AM
5	Very little bike path infrastructure	May 17, 2010 2:29 AM

14. What do you see as the Town's greatest weakness in terms of bikeability?

	Other (please specify)	
6	places are too spread out and not concentrated.	May 17, 2010 9:36 PM
7	no where to bike safely	Jun 3, 2010 5:41 PM
8	Narrow streets	Jun 3, 2010 10:09 PM
9	narrow road "Old Monroe" and 74 is too dangerous for bike	Jun 4, 2010 4:49 PM
10	I do not know of any marked areas.	Jun 4, 2010 11:44 PM
11	Room for actual cyclist to feel safe.	Jun 12, 2010 5:04 PM
12	People don't ride because its not safe	Jun 15, 2010 10:54 AM
13	Roads are not wide enough to accommodate a biker	Jun 15, 2010 12:27 PM
14	Road width.	Jun 15, 2010 1:46 PM
15	poor street connections, too much traffic	Jun 15, 2010 2:24 PM
16	Not enough safe traveling routes. Bikes should have bike lanes for riding on, not sidewalks.	Jun 16, 2010 2:13 PM
17	Lack of driver/rider education/etiquette. People need to know cyclists have the same right to the road as drivers.	Jun 18, 2010 11:52 AM
18	Indian Trail's transportation and land use is very car-centric.	Jun 23, 2010 3:00 PM
19	Adequate bike lanes	Jun 26, 2010 5:12 PM
20	NO TRAFFIC ENFORCEMENT	Jul 6, 2010 5:35 PM
21	roads not wide enough even for cars let alone bikes	Jul 20, 2010 11:51 AM
22	Lack of interconnecting safe greenways. The lengthier a cycle path the more it attacts cyclists.	Oct 12, 2010 1:46 PM
23	safety, lack of facilities	Oct 23, 2010 2:00 PM
24	No developed bike paths at all	Oct 23, 2010 2:33 PM

16. What types of bicycle facilities do you feel comfortable riding on? (check all

	Other (please specify)	
1	Bike lanes/sidewalks.	Jun 18, 2010 11:52 AM
2	bicycle boulevards	Jun 23, 2010 3:00 PM

17. What would encourage you to bike more?

	Response Text	
1	safe designated pathways	May 4, 2010 1:54 PM
2	Safe places to do it by bike lanes on roads and by providing greenway lanes that are lengthy enough to give a good ride. Connected biking trails that would allow me to run errands on my bike safely.	May 7, 2010 3:04 PM
3	a trail that led to a coffee shop or something to go to!	May 12, 2010 8:14 PM
4	Safer means of biking on the road	May 12, 2010 8:52 PM
5	Not riding in traffic at all. Bicycle use only.	May 13, 2010 1:52 AM
6	See above comments.	May 13, 2010 2:28 AM

17. What would encourage you to bike more?

	Response Text	
7	Great, paved, smooth paths that connect us to other parts of Indian Trail.	May 13, 2010 11:47 AM
8	Easy access to trails and desirable locations via the trails	May 13, 2010 6:10 PM
9	Paths that are safe from auto traffic	May 17, 2010 1:06 AM
10	Better infrastructure of paths; more parks/nature areas available with better bike path connections to those parks/nature areas	May 17, 2010 2:29 AM
11	safer paths to get within a couple of miles from where I live.	May 17, 2010 9:36 PM
12	A major bike campaign sponsored by area business' to promote health and well being. Or a local fundraiser for in town activities, local National Guard, local veteran's assistance, out-of-work locals, local education drive, and/or create greater minority invovlement.	Jun 2, 2010 12:19 PM
13	safer communte, maybe a bike lane or bigger shoulder or a turning lane in the middle so vehicles can go around without worring to much about on coming traffic	Jun 3, 2010 4:46 PM
14	safe places to ride and trail or greenways	Jun 3, 2010 5:41 PM
15	connectivity	Jun 3, 2010 8:14 PM
16	Connecting sidewalks between neighborhoods, as in Matthews.	Jun 3, 2010 8:26 PM
17	I live very close to the new Harris Teeter on Potter Rd and would love to pull a bike trailer to do light shopping, but the traffic & roads on Potter and Chestnut is just not at all conducive for such activity. It would also be nice to ride with my wife and daughter without fear of traffic.	Jun 3, 2010 10:09 PM
18	Off road trails nearby that are close enough to ride to; something like Sherman Branch in Mint Hill or the trails at Francis Beatty Park in Matthews.	Jun 4, 2010 1:03 AM
19	the abilty to stay out of trafic when tooling around ppl dont watch for bikes there has been a few times some car has left it paint on my leg	Jun 4, 2010 1:05 AM
20	More Bike paths	Jun 4, 2010 1:23 AM
21	More trails that I could ride to instead of loading up my bike and all my gear than driving to a trail.	Jun 4, 2010 1:28 AM
22	More trails and/or bike lanes to take me to places, shopping, food.	Jun 4, 2010 4:49 PM
23	A safe place on the streets where cars could not come close to hitting me.	Jun 4, 2010 4:57 PM
24	More park area or bike routes that are not the same as a busy road	Jun 4, 2010 5:10 PM
25	Marked areas on streets that are separated from motor traffic	Jun 4, 2010 11:44 PM
26	I live on Wonderland off Chestnut. If this side of Chestnut had sidewalks or a bike trail to get us to either Monroe Rd or Potter Rd. we could connect to the sidewalks on those roads to get around town.	Jun 5, 2010 1:17 PM
27	Bike lanes properly demarcated as such and wide enough to maneuver properly and defensively, even with rails. Clear signs warning motorist about bike riders, i.e. "slow down if you see bike riders, children, etc."	Jun 5, 2010 3:05 PM
28	Bike lanes	Jun 6, 2010 10:52 PM
29	bike lanes	Jun 7, 2010 4:33 PM
30	An area for biking. Trails/greenway and if I had to ride along with traffic a bike lane or even better a SIDEWALK.	Jun 12, 2010 5:04 PM
31	Nothing, I bike quite often already.	Jun 14, 2010 2:04 PM
32	more bike lanes that are visible, traffic signs. interconnect bike paths to and from Indian Trail. LAWS that are made	Jun 15, 2010 3:25 AM
33	more sidewalks for the kids, bike lanes for adults.	Jun 15, 2010 10:54 AM
34	A safe place to do so	Jun 15, 2010 12:27 PM
35	I would probalbly bike more if there was a bike path through nature readily available rather than just on the streets.	Jun 15, 2010 1:46 PM

17. What would encourage you to bike more?

	Response Text	
36	A safe environment that would allow me to bike to actual locations in Indian Trail.	Jun 15, 2010 1:57 PM
37	safety	Jun 15, 2010 6:14 PM
38	Wider roads with bike lanes.	Jun 16, 2010 2:13 PM
39	An actual bike path! Then I could ride with my children and know that we will be safe!	Jun 16, 2010 2:49 PM
40	Bike lanes, sidewalks, 'Share the Road' signs, flyers that educate drivers, cyclist awareness programs, clubs/groups, tax/medical insurance incentives, greenways/trails that lead to relevant destinations.	Jun 18, 2010 11:52 AM
41	Greenways!!!!	Jun 19, 2010 1:55 AM
42	nearby trails & bike lanes aournd town	Jun 22, 2010 10:45 PM
43	Bike lanes.	Jun 23, 2010 2:15 AM
44	Not being the only person on a bike in town. Lower speed limits. Bike lanes. Better connections between origins and destinations that do not require riding on thoroughfares. Drivers who are more tolerant sharing the road with cyclists.	Jun 23, 2010 3:00 PM
45	no bike paths or designated place	Jun 27, 2010 1:34 PM
46	More bike lanes & paved trails or greenways	Jun 28, 2010 2:30 PM
47	abilty to get from one neighbor hood to another eventually getting to shoping centers etc.	Jul 20, 2010 11:51 AM
48	More bike lanes built on busy streets.	Sep 21, 2010 5:47 AM
49	Add more bike lanes and multi-use paths	Oct 12, 2010 1:46 PM
50	See 14. comment	Oct 12, 2010 1:46 PM
51	greenways	Oct 13, 2010 8:07 PM
52	more trails and paths	Oct 23, 2010 2:00 PM
53	available trails	Oct 23, 2010 2:33 PM
54	purchase a bike	Oct 23, 2010 2:37 PM
55	safe areas that you dont have to worry about vehicles overtaking children rinding with me	Oct 23, 2010 3:17 PM
56	More bikeable paths to shopping and coffee shops, restaurants, etc.	Oct 23, 2010 4:02 PM
57	Having greenways that are safe to take my daughter on. She is almost two and we would like to have somewhere other than roads for her to rider her bike on as she is learning and growing as a cyclist.	Oct 23, 2010 4:59 PM
58	Biking groups, improved trails, improved bike areas, biking pr around the city	Oct 23, 2010 5:51 PM

18. Additional Comments:

	Response Text	
1	Biking is a wonderful way for families to do something together that is enjoyable, good exercise and a way to get to know other peopls. Biking also promotes a personal connection to the beauty of our community. If we feel we own it and can feel proud of it, we will value it.	May 7, 2010 3:04 PM

18. Additional Comments:

	Response Text	
2	Is there anyway to get a bike path from Brookhaven to Beatty Park and to Harris Teeter. Without a bike path, we cannot even walk to the grocery store. With a bike path, a lot of people in the neighborhood would "go green" and walk or bike to the grocery store. Please help us get a bike path! Thank you.	May 13, 2010 3:19 AM
3	We're excited! Thank you for all you do for the residents of Indian Trail!	May 13, 2010 11:47 AM
4	A path that connects our neighborhoods to each other, connects us to towns retail and parks.	May 13, 2010 6:10 PM
5	I live on the north western edge of Indian Trail and there is no good way to safely ride a bike to central Indian Trail.	May 17, 2010 9:36 PM
6	Kevin R. Mays Public Accoutant Mays Concepts Owner (704)641-5379 There are a lot of ideas I can come up with to promote Indian Trail that will create a sense of unity in the lives in our small community. We have the motivation to make changes that will be appealing to mostly everyone. Peace, is the word that we should promote in this small town. Peace, is the word that should be on banners to welcome people into our small town. Not only are we the fastest growing town in America, but we can also be the major contributor of Peace in America by setting the standard of unity. Truly creating the landmark from Indian Trail, NC that puts the "United" in United States of America.	Jun 2, 2010 12:19 PM
7	Love the fact that indian trail is being proactive and concerned about bicyclist in it's community	Jun 3, 2010 4:46 PM
8	I am very glad to see steps being made to bring (safe) bicycle transportation to IT. Thank you. Rich Davis 5901 Potter Rd	Jun 3, 2010 10:09 PM
9	what would it take to make a moutain bike trail for us trailblazers.org does a lot of good work in meck, cabarruss and stanlet counties	Jun 4, 2010 1:05 AM
10	Thanks for listening to the cycling community. I am the Service Manager for Southpark Cycles in Charlotte, if we could be of any assistance, feel free to contact me. John Irvin 704 522 7006	Jun 4, 2010 1:28 AM
11	As a fairly recent resident to IT, I feel this is good to see the town take this survey. Getting people on bike for fun and transportation is a great way to keep the populations in shap. This, in my opinion, requires bike lanes and trail to allow people access to places of interest. Creating bike lanes seperated by a median or grass would make people feel much safer. This is a common practice in major metro areas and Europe. Also, having bike routes linked to any public transportation would also help. If I can help with this program, please let me know. Thanks John Motuz jmotuz19@gmail.com	Jun 4, 2010 4:49 PM
12	This is a great initiative. I hope it comes to fruition. Thank you for your interest. Mr. Oscar Ortiz and fa. 15 yrs. Indian Trail resident & Union County employee www.oscarortiz.com	Jun 5, 2010 3:05 PM
13	The coast of gas is going to influence more and more bike use.	Jun 7, 2010 4:33 PM

18. Additional Comments:

	Response Text	
14	I love to bike, grew up with it and would LOVE to be able to do it here too. It should be SAFE and people are stil not educated in how to SHARE the road safely with a biker/bycicist. LIGHTS at certain parts of the road(s) would also be safer or more better reflective signs. I am looking forward to positive changes that might/will come :) Good luck. Ameridutchman.	Jun 15, 2010 3:25 AM
15	Thank you for this survey. I hope the town is willing to improve sidewalks, cross walks and bike lanes. Then bike riding can be for everyone.	Jun 15, 2010 10:54 AM
16	I think the idea of establishing bike paths and/or park trails would be great if they also allowed skateboarders. This would give the teenagers a place to enjoy their favorite past time and directly reduce the current loitering that takes place in town.	Jun 15, 2010 1:46 PM
17	I'm very excited about this development! I can't wait for it to get setup!	Jun 15, 2010 1:57 PM
18	I think its a great idea and I hope to see Indian Trail actually follow through with it.	Jun 16, 2010 2:49 PM
19	I have been hoping for something like this for a long time! I truly believe, and have seen, that people will get out and ride/walk/run if given the safe opportunity to do so. Examples: Pleasant Plains Rd. sidewalk (my favorite (greenway), Potter Rd sidewalk, Old Monroe Rd. sidewalk. These lead to shopping/dining centers. People WILL be healthier and health care costs would drop, as well as the quality of life will improve in this town. Just look at places like Portland, OR. People WANT to live there just because of the biking/walking infrastructure.	Jun 18, 2010 11:52 AM
20	I think that aside from adding bicycle lanes to our roads, it would be a great service to educate our community on sharing the road with cyclists. There are too many angry and impatient drivers that put us in danger. Almost every week I encounter drivers or passengers yelling unfriendly words at us while we drive. They don't realize the danger that they put us in by riding too close, swirving or passing unsafely. I work in Concord and there were recent deaths and injuries caused by senseless aggression towards cyclists. I hope that we can make this a safe community for all. Thank you all for your efforts!!!	Jun 23, 2010 2:15 AM
21	I think dealing with Hwy 74 is going to be a huge physical barrier to overcome when it comes to creating bike linkages between the north and south side of this highway. I think it is going to take installing some really well designed intersection treatments in order to create safe crossings for cyclists and pedestrains both. The good news is that there are already some good treatments out there that seem to work well in other places, we just need to make sure that whatever we choose for Indian Trail is appropriate for this context so that it will actually achieve its purpose instead of just confusing motorists and cyclists and making matters worse/more unsafe.	Jun 23, 2010 3:00 PM
22	When people cannot comprehend speed limits,stop signs,redlights,how are people going to follow rules for bike paths,the way people ignore motor vehicle laws,its going to be like throwing a fire cracker in a bucket of gas.Look out your front doors,you can see people think the Law does not pretain to them.plus no matter how big a sign is put up,PEOPLE ARE GOING TO IGNORE THEM.Maybe after we get some traffic relief it might work,The way the economy is ,its crazy to spend money on an unnessary project.When the play money runs out,the town will look at taxpayers to pay for all the waste that going on now.	Jul 6, 2010 5:35 PM
23	A small amount of money in the right places could make a difference.	Jul 20, 2010 11:51 AM
24	Indian Trail is not a community cohesive to a bike plan. This works in a more scenic area such as Hilton Head. I would not pursue this plan.	Aug 13, 2010 2:42 PM

18. Additional Comments:

	Response Text	
25	I have lived in fort collins, co for the past two years and they have a great bike community. Over 60% of the streets (my own estimate) have bike lanes. This makes commuting safer and much less intimidating to people new to commuting by bike when riding with traffic. There is also several greenways that are foot and bike travel only that connect the town and allow an even safer alternative to using bike lanes. I believe that indian trail could benefit greatly from the model that fort collins has presented when considering commuting by bike.	Sep 21, 2010 5:47 AM
26	Indian Trail has a great location. If cultivated correctly it could be a destination cycling community.	Oct 12, 2010 1:46 PM
27	You can toss this out, Kevin, I just wanted to see how well the form and format work.	Oct 23, 2010 3:49 PM
28	I am so glad that there are plans in place to improve and connect this great community of Indian Trail. I feel like it will make the area appeal to people who are looking to commute to Charlotte.	Oct 23, 2010 4:59 PM
29	Consider providing information on the benefits of biking to groups that this addresses. By demonstrating the benefits of biking vs cars is a great tool to demonstrate to residents on making the switch to biking.	Oct 23, 2010 5:51 PM

APPENDIX C

Bicycle Matrix

Bike It

Indian Trail Bicycle Master Plan

Quadrant #1 - Project List

Neighborhood Loops

Project ID	Loop Number	Project Location	From	To	Length (mi)	Facility Type	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
39	8	US 74	Indian Trail Fairview Rd	Unionville Indian Trail Rd	0.68	Multi-Use Path	10' wide concrete sidewalk	Mid-Term	L/S	IT/NCDOT
40	8	Unionville Indian Trail Rd	US 74	Younts Rd	0.21	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
41	8	Unionville Indian Trail Rd	Younts Rd	Faith Church Rd	0.70	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
37	8	Younts Rd	Indian Trail Fairview Rd	Unionville Indian Trail Rd	1.00	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
48	10	Idlewild Rd	Crismark Dr	Mill Grove Rd	0.85	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
49	10	Mill Grove Rd	Idlewild Rd	Red Lantern Rd	0.71	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
38	8	Indian Trail Fairview Rd	US 74	Younts Rd	0.49	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
52	11	Mill Grove Rd	Red Lantern Rd	Crismark Dr	0.14	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
50	10, 11	Red Lantern Rd	Crismark Dr	Mill Grove Rd	0.68	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT
51	10	Crismark Dr	Idlewild Rd	Hyde Park Dr	0.32	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT
53	10	Clearwater Dr	Red Lantern Rd	Hembrywood Dr	0.55	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT
53	11	Crismark Dr	Mill Grove Rd	Chimney Wood Tr	0.45	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT
54	11	Crismark Dr	Chimney Wood Tr	Hyde Park Dr	0.59	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT

Town-Wide Connectors

Project ID	Connector Number	Project Location	From	To	Length (mi)	Facility Type	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
35	8	US 74	Indian Trail Rd	Unionville Indian Trail Rd	0.68	Multi-Use Path	10' wide concrete sidewalk	Mid-Term	L/S	IT/NCDOT
36	8	US 74	Unionville Indian Trail Rd	Faith Church Rd	0.79	Multi-Use Path	10' wide concrete sidewalk	Mid-Term	L/S	IT/NCDOT
33	7	Indian Trail Fairview Rd	Younts Rd	Secrest Short Cut Rd	1.64	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
34	8	US 74	Northwestern town limits	Indian Trail Rd	0.33	Multi-Use Path	10' wide concrete sidewalk	Mid-Term	L/S	IT/NCDOT
32	7	Indian Trail Fairview Rd	US 74	Younts Rd	0.50	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
40	9	Secrest Short Cut Rd	Mill Grove Rd	Faith Church Rd	1.00	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
42	10	Mill Grove Rd	Secrest Short Cut Rd	Crismark Dr	0.86	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
43	10	Mill Grove Rd	Crismark Dr	Lawyers Rd	1.58	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT

Neighborhood Connectors

Project ID	Project Location	From	To	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
1	Hemby Acres	Hemby Wood Dr/Clearwater Dr	Back side of Food Lion	8'-10' wide asphalt or concrete path	Long-Term	L/P	IT/HOA
2	Beacon Hills / Crismark	Red Lantern Rd	Hyde Park Dr	8'-10' wide asphalt or concrete path	Long-Term	L/P	IT/HOA

* Note: These are planning level costs and do not factor in right-of-way acquistion, mobilization, utility relocation, grading and other detailed costs that are associated with the preparation of engineering drawings and/or actual construction bids

Agency/Department	Funding Sources	
IT - Indian Trail	**L - Local**	**N - National**
NCTA - North Carolina Turnpike Authority	General Fund	Transportation Enhancement Program
NCDOT - North Carolina Department of Transportation	Park Funds	CMAQ
CTT - Carolina Thread Trail	Road Improvement Funds	**P - Private**
	Powell Bill Funds	Carolina Thread Trail
	S - State	Developers
	Safe Routes to School	
	Governor's Highway Safety Program	
	North Carolina Parks and Recreation Trust Fund	
	North Carolina Conservation Tax Credit Program	
	North Carolina Trails Program	

Quadrant #2 - Project List

Neighborhood Loops

Project ID	Loop Number	Project Location	From	To	Length (mi)	Facility Type	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
42	13	Unionville Indian Trail Rd	Faith Church Rd	Sardis Church Rd	0.96	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
69	18	Arbor Pointe Dr/Hunters Trail Dr	Unionville Indian Trail Rd W	Secrest Short Cut Rd	1.08	NSR	see Section 9B.21 of the MUTCD	Mid-Term	L	IT/NCDOT
70	18	Southern Ginger Dr/Braefield Dr	Unionville Indian Trail Rd W	Cardinal Bluff Ln	0.60	NSR	see Section 9B.21 of the MUTCD	Mid-Term	L	IT/NCDOT
56	13	Faith Church Rd	Unionville Indian Trail Rd	Proposed Monroe Bypass Access Rd	1.39	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
47	9	Poplin Rd	Bonterra Blvd	Rocky River Rd	1.04	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
71	18	Off road	Cardinal Bluff Ln	Edgeview Dr	0.15	NSR	see Section 9B.21 of the MUTCD	Mid-Term	L	IT/NCDOT
43	13	Unionville Indian Trail Rd	Sardis Church Rd	Secrest Short Cut Rd	0.53	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
44	9, 13	Unionville Indian Trail Rd	Secrest Short Cut Rd	Rocky River Rd	1.35	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
45	9	Rocky River Rd	Poplin Rd	Unionville Indian Trail Rd	1.11	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
46	9	Poplin Rd	Unionville Indian Trail Rd	Bonterra Blvd	0.91	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
57	13	Proposed Monroe Bypass Access Rd	Faith Church Rd	Poplin Rd	1.35	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
55	12	Proposed greenway	Indian Trail Fairview Rd	Bonterra Neighborhood	1.38	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Long-Term	L/P	IT/CTT
66	17	Off road	Filly Dr	Sedgewick Rd/Poplin Rd	0.11	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT
65	17	Bonterra Subdivision	Saratoga Blvd	Filly Dr	1.08	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT
67	17	Sedgewick Rd/Emerson Ln	Poplin Rd	Terrapin St	0.33	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT
68	17	Bonterra Blvd	Poplin Rd	Filly Dr	0.04	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT/NCDOT

Town-Wide Connectors

Project ID	Connector Number	Project Location	From	To	Length (mi)	Facility Type	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
22	4	Sardis Church Rd	US 74	Unionville Indian Trail Rd	1.04	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
38	8	US 74	Sardis Church Rd	Hayes Rd	1.01	Multi-Use Path	10' wide concrete sidewalk	Mid-Term	L/S	IT/NCDOT
7	2	Proposed greenway	US 74 (east side)	Sardis Church Rd	1.37	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Mid-Term	L/P	IT/CTT
8	2	Proposed greenway	Sardis Church Rd	Secrest Short Cut Rd	1.72	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Mid-Term	L/P	IT/CTT
15	3	Overhead utility line	US 74	Unionville Indian Trail Rd	0.69	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Mid-Term	L/P	IT/CTT
16	3	Overhead utility line	Unionville Indian Trail Rd	Secrest Short Cut Rd	1.01	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Mid-Term	L/P	IT/CTT
37	8	US 74	Faith Church Rd	Sardis Church Rd	0.60	Multi-Use Path	10' wide concrete sidewalk	Mid-Term	L/S	IT/NCDOT
11	2	Price Rd	Rocky River Rd	East of Porter Ridge Campus Dr	0.45	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Mid-Term	L/P	IT/CTT
12	2	Rocky River Rd	Price Rd	South of Indian Trial Fairview Rd	0.45	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
23	4	Sardis Church Rd	Unionville Indian Trail Rd	Secrest Short Cut Rd	0.54	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
41	9	Secrest Short Cut Rd	Faith Church Rd	Unionville Indian Trail Rd	1.35	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
9	2	Proposed greenway	Secrest Short Cut Rd	Unionville Indian Trail Rd	1.23	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Long-Term	L/P	IT/CTT
10	2	Proposed greenway	Unionville Indian Trail Rd	Price Rd	2.06	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Long-Term	L/P	IT/CTT
17	3	Overhead utility line	Secrest Short Cut Rd	Rocky River Rd	2.42	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Long-Term	L/P	IT/CTT
18	3	Overhead utility line	Rocky River Rd	Lawyers Rd	1.33	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches,	Long-Term	L/P	IT/CTT
39	8	US 74	Hayes Rd	Southeastern town limits	1.24	Multi-Use Path	10' wide concrete sidewalk	Long-Term	L/S	IT/NCDOT

Neighborhood Connectors

Project ID	Project Location	From	To	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
8	Bonterra Village / Annandale	Filly Dr	Sedgewick Rd	8'-10' wide asphalt or concrete path	Long-Term	L/P	IT/HOA

* Note: These are planning level costs and do not factor in right-of-way acquistion, mobilization, utility relocation, grading and other detailed costs that are associated with the preparation of engineering drawings and/or actual construction bids

Agency/Department	Funding Sources	
IT - Indian Trail	**L - Local**	**N - National**
NCTA - North Carolina Turnpike Authority	General Fund	Transportation Enhancement Program
NCDOT - North Carolina Department of Transportation	Park Funds	CMAQ
CTT - Carolina Thread Trail	Road Improvement Funds	**P - Private**
	Powell Bill Funds	Carolina Thread Trail
	S - State	Developers
	Safe Routes to School	
	Governor's Highway Safety Program	
	North Carolina Parks and Recreation Trust Fund	
	North Carolina Conservation Tax Credit Program	
	North Carolina Trails Program	

Quadrant #3 - Project List

Neighborhood Loops

Project ID	Loop Number	Project Location	From	To	Length (mi)	Facility Type	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
28	6, 7	Pony Tail Ln	Rogers Rd	Mustang Dr	0.42	NSR	see Section 9B.21 of the MUTCD	Mid-Term	L	IT
29	6, 7	Mustang Dr	Pony Tail Ln	Old Monroe Rd	0.37	NSR	see Section 9B.21 of the MUTCD	Mid-Term	L	IT
31	7	Old Monroe Rd	Mustang Dr	Wesley Chapel Rd	0.19	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
32	7	Old Monroe Rd	Wesley Chapel Rd	Faircroft Way	0.82	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
35	7	Rogers Rd	Grayson Pkwy	Wesley Chapel Rd	1.06	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
36	7	Rogers Rd	Wesley Chapel Rd	Brandon Oaks Pkwy	0.39	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
33	7	Old Monroe Rd	Faircroft Way	Rogers Rd	0.82	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
58	14	Devon Dr	Rogers Rd	Devon Dr terminus	0.22	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
59	14	Faircroft Way	NE side of Devon Dr terminus	Old Charlotte Hwy	0.86	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
60	14	Off road	Devon Dr terminus	Faircroft way	0.03	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
61	15	Inlet Way / Brook Valley Run	Wesley Chapel Rd	Stream crossing	0.63	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
63	15	Sunlight Path Dr	East of Streamlet Way	Rogers Rd	0.29	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
34	7	Rogers Rd	Old Monroe Rd	Grayson Pkwy	1.17	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
62	15	Off road	Streamlet Way	Sunlight Path Dr	0.19	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT

Town-Wide Connectors

Project ID	Connector Number	Project Location	From	To	Length (mi)	Facility Type	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
14	3	Overhead utility line	Old Monroe Rd	US 74	1.17	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Mid-Term	L/P	IT/CTT
21	4	Wesley Chapel Stouts Rd	Old Monroe Rd	US 74	1.18	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
20	4	Wesley Chapel Rd	Rogers Rd	Old Monroe Rd	0.76	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
28	6	CSX Railroad	Wesley Chapel Stouts Rd	Southeastern town limits	1.72	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles,	Mid-Term	L/P	IT/CTT
19	4	Wesley Chapel Rd	Hawfield Rd	Rogers Rd	1.22	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
25	5	Overhead utility line	Rogers Rd	Old Charlotte Hwy	0.86	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles,	Long-Term	L/P	IT/CTT
24	5	Overhead utility line	Western town limits	Rogers Rd	0.87	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles,	Long-Term	L/P	IT/CTT

Neighborhood Connectors

Project ID	Project Location	From	To	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
3	Sandalwood	Devon Dr	Faircroft Way	8'-10' wide asphalt or concrete path	Long-Term	L/P	IT/HOA
4	Brook Valley	Streamlet Way	Proposed Greenway	8'-10' wide asphalt or concrete path	Long-Term	L/P	IT/HOA
5	Meriwether	Kansas City Way	Proposed Greenway	8'-10' wide asphalt or concrete path	Long-Term	L/P	IT/HOA
6	Meriwether	Salmon River Rd	Proposed Greenway	8'-10' wide asphalt or concrete path	Long-Term	L/P	IT/HOA
7	Meriwether	Fort Manden Dr	Sunlight Path Dr	8'-10' wide asphalt or concrete path	Long-Term	L/P	IT/HOA

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NCDOT - North Carolina Department of Transportation	Park Funds	CMAQ
CTT - Carolina Thread Trail	Road Improvement Funds	**P - Private**
	Powell Bill Funds	Carolina Thread Trail
	S - State	Developers
	Safe Routes to School	
	Governor's Highway Safety Program	
	North Carolina Parks and Recreation Trust Fund	
	North Carolina Conservation Tax Credit Program	
	North Carolina Trails Program	

Quadrant #4 - Project List

Neighborhood Loops

Project ID	Loop Number	Project Location	From	To	Length (mi)	Facility Type	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
25	5	Southfork Rd	Old Monroe Rd	Indian Trail Rd	0.73	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
20	4, 5	Old Monroe Rd	Waxhaw Indian Trail Rd	Southfork Rd	0.48	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
26	5	Indian Trail Rd	Old Monroe Rd	Southfork Rd	0.64	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
21	4	Old Monroe Rd	Southfork Rd	Brandon Oaks Pkwy	0.63	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
24	4	Pioneer Ln	Eastern terminus	Waxhaw Indian Trail Rd	1.15	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
30	6	Old Monroe Rd	Brandon Oaks Pkwy	Mustang Dr	1.08	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
22	4, 6	Brandon Oaks Pkwy	Old Monroe Rd	Summerston Ln	0.47	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
16	3	Waxhaw Indian Trail Rd	Fincher Rd	Pioneer Ln	0.45	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
18	3	Chestnut Ln	Potter Rd	Old Monroe Rd	0.99	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
17	3, 4	Waxhaw Indian Trail Rd	Pioneer Ln	Old Monroe Rd	0.43	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
19	3	Old Monroe Rd	Chestnut Ln	Waxhaw Indian Trail Rd	0.29	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
64	16	Colton Ridge Dr	Waxhaw-Indian Trail Rd	Pioneer Ln	0.60	NSR	see Section 9B.21 of the MUTCD	Mid-Term	L	IT
10	2	Middleton Ave	Delamere Dr	Potter Rd	0.32	NSR	see Section 9B.21 of the MUTCD	Mid-Term	L	IT
11	2	Chestnut Ln	Ainsdale Dr	Potter Rd	0.55	NSR	see Section 9B.21 of the MUTCD	Mid-Term	L	IT
13		Potter Rd	Chestnut Ln	Pleasant Plains Rd	0.93	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
2	1	Matthews Weddington Rd	Chestnut Ln	Antioch Church Rd	0.19	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
3	1	Antioch Church Rd	Matthews Weddington Rd	Castleford Blvd	0.45	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
5	1	Camrose Crossing Ln	Castleford Blvd	Lytton Ln	0.40	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
9	2	Sudbury Ln	Ainsdale Dr	Delamere Dr	0.17	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
27	6	Brandon Oaks Pkwy	Summerston Ln	Rogers Rd	1.09	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
12	2, 3	Potter Rd	Middleton Ave	Chestnut Ln	0.37	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
14	3	Potter Rd	McLendon Rd	Fincher Rd	0.19	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
23	4	Summerston Ln	Brandon Oaks Pkwy	Pioneer Ln	0.10	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
4	1	Castleford Blvd	Antioch Church Rd	Camrose Crossing Ln	0.04	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
6	1	Lytton ln	Camrose Crossing Ln	Delamere Dr	0.22	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
7	1	Delamere Dr	Lytton Ln	Ainsdale Dr	0.51	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
8	1, 2	Ainsdale Dr	Delamere Dr	Chestnut Ln	0.54	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT
15	3	Fincher Rd	Potter Rd	Waxhaw Indian Trail Rd	1.15	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
72	2	Delamere Dr	Sudbury	Ainsdale Dr	0.40	NSR	see Section 9B.21 of the MUTCD	Long-Term	L	IT

Town-Wide Connectors

Project ID	Connector Number	Project Location	From	To	Length (mi)	Facility Type	Improvements Needed	Scheduled Priority	Funding Source	Responsibility
6	2	Proposed greenway	Indian Trail Rd	US 74 (west side)	1.95	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Short-Term	L/P	IT/CTT
27	6	CSX Railroad	Indian Trail Rd	Wesley Chapel Stouts Rd	2.23	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Mid-Term	L/P	IT/CTT
4	1	Proposed greenway	Old Monroe Rd	US 74	1.49	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Mid-Term	L/P	IT/CTT
5	2	Proposed greenway	Arrow Dr	Indian Trail Rd	0.98	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Mid-Term	L/P	IT/CTT
30	7	Indian Trail Rd	Coventry Dr	CSX Railroad	0.71	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
26	6	CSX Railroad	Northwestern town limits	Indian Trail Rd	0.69	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Mid-Term	L/P	IT/CTT
31	7	Indian Trail Rd	CSX Railroad	US 74	0.59	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
3	1	Chestnut Ln	Potter Rd	Old Monroe Rd	0.96	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
29	7	Waxhaw-Indian Trail Rd	Southwestern town limits	Coventry Dr	2.40	Bike Lane	4'-5' Striped Lane and MUTCD signs	Mid-Term	L/S	IT/NCDOT
45	12	Overhead utility line (outside town limits)	West of Matthews Weddington Rd / Chestnut Ln	I-485 / John St	3.62	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Mid-Term	L/P	IT/CTT
13	3	Overhead utility line	Western town limits	Old Monroe Rd	1.85	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Mid-Term	L/P	IT/CTT
1	1	Chestnut Ln	Matthews Weddington Rd	Ainsdale Dr	1.15	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
2	1	Chestnut Ln	Ainsdale Dr	Potter Rd	0.55	Bike Lane	4'-5' Striped Lane and MUTCD signs	Long-Term	L/S	IT/NCDOT
44	11	Overhead utility line (outside town limits)	West of Potter Rd	East of Jim Parker Rd	2.59	Greenway	10' Asphalt trail, regulatory/guiding signs, trash receptacles, benches, intersection warning signs	Long-Term	L/P	IT/CTT

* Note: These are planning level costs and do not factor in right-of-way acquistion, mobilization, utility relocation, grading and other detailed costs that are associated with the preparation of engineering drawings and/or actual construction bids

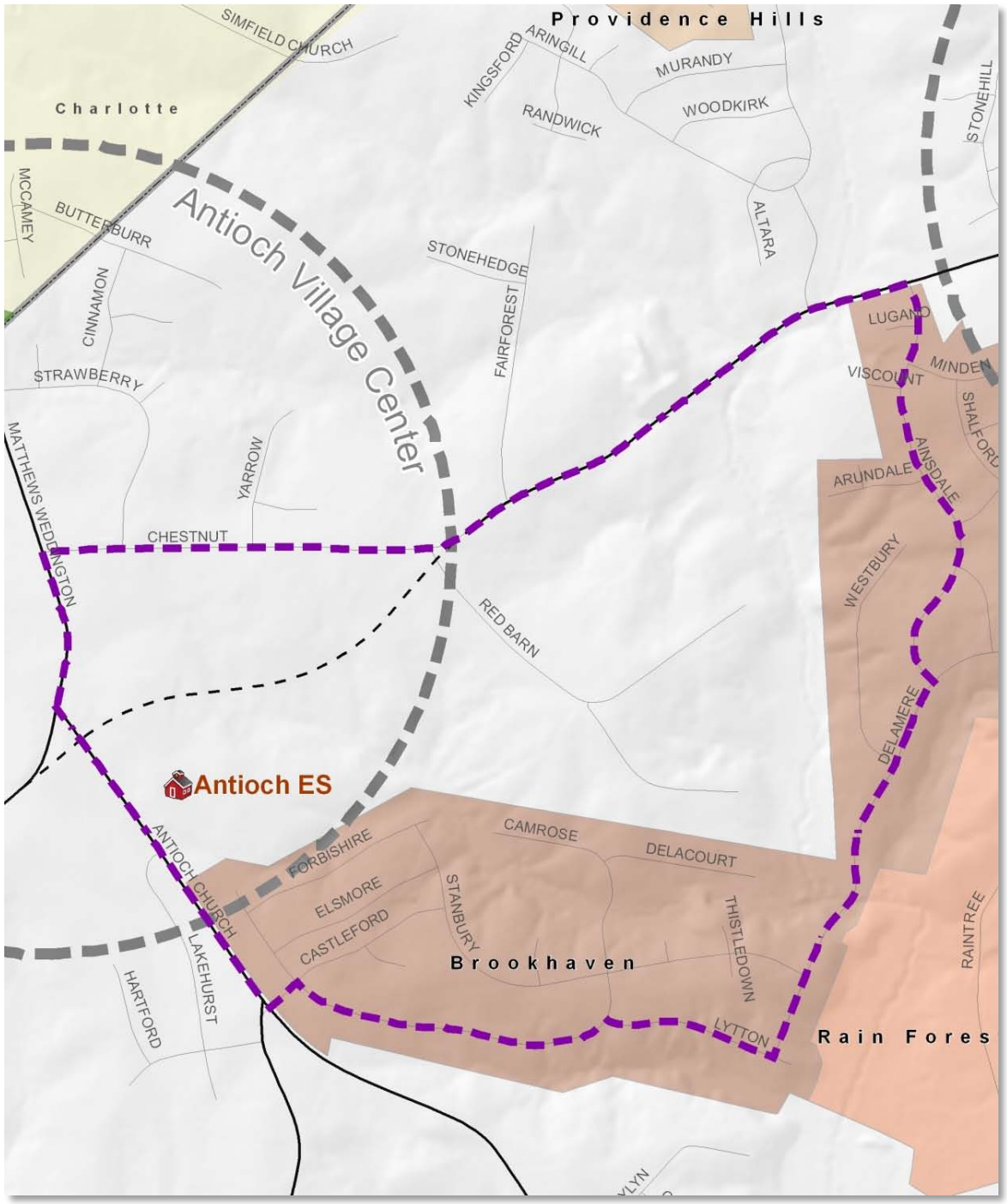
Agency/Department	Funding Sources	
IT - Indian Trail	**L - Local**	**N - National**
NCTA - North Carolina Turnpike Authority	General Fund	Transportation Enhancement Program
NCDOT - North Carolina Department of Transportation	Park Funds	CMAQ
CTT - Carolina Thread Trail	Road Improvement Funds	**P - Private**
	Powell Bill Funds	Carolina Thread Trail
	S - State	Developers
	Safe Routes to School	
	Governor's Highway Safety Program	
	North Carolina Parks and Recreation Trust Fund	
	North Carolina Conservation Tax Credit Program	
	North Carolina Trails Program	

APPENDIX D
Neighborhood Loops

Bike It

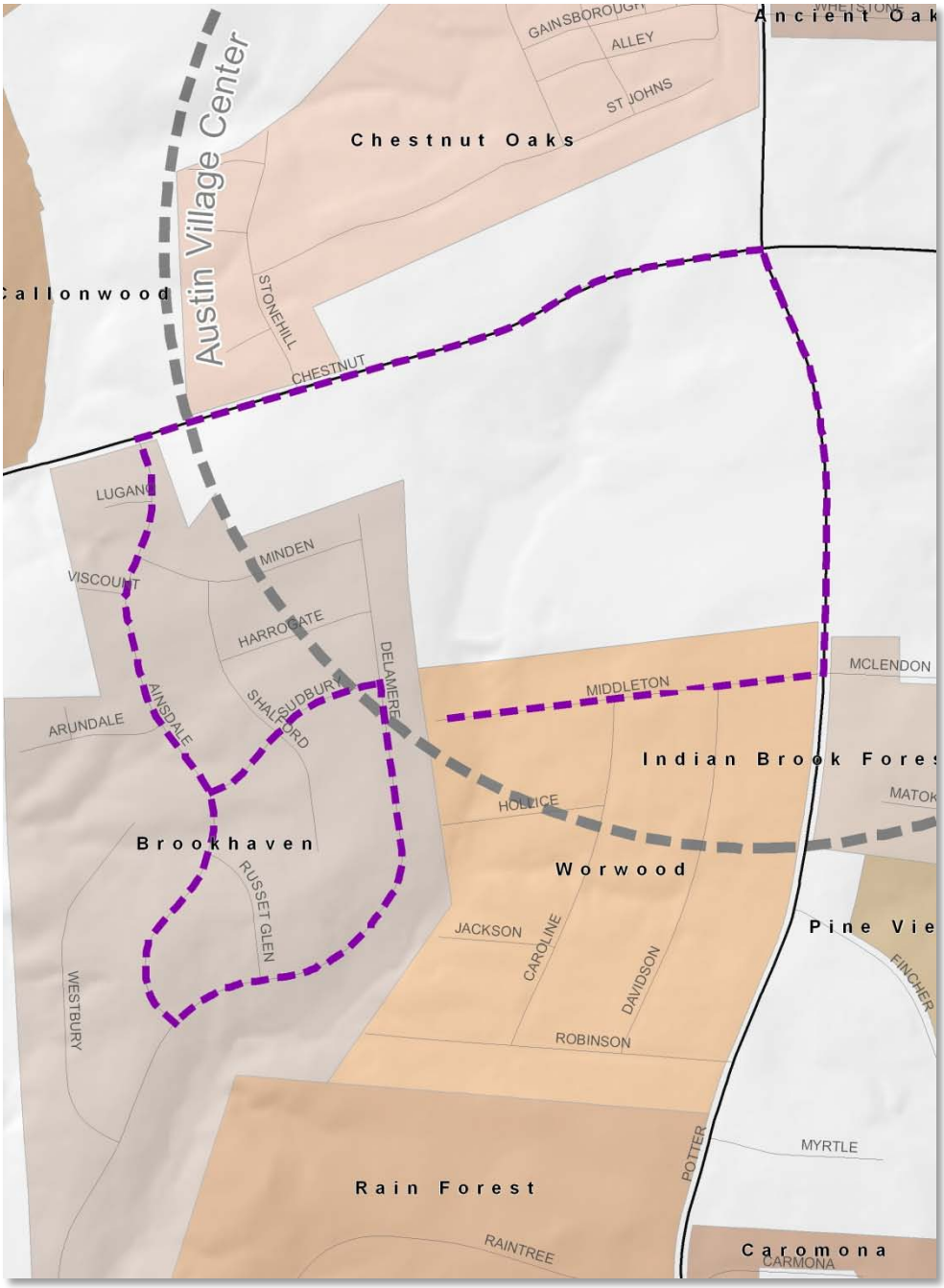
Indian Trail Bicycle Master Plan

Neighborhood Loop #1



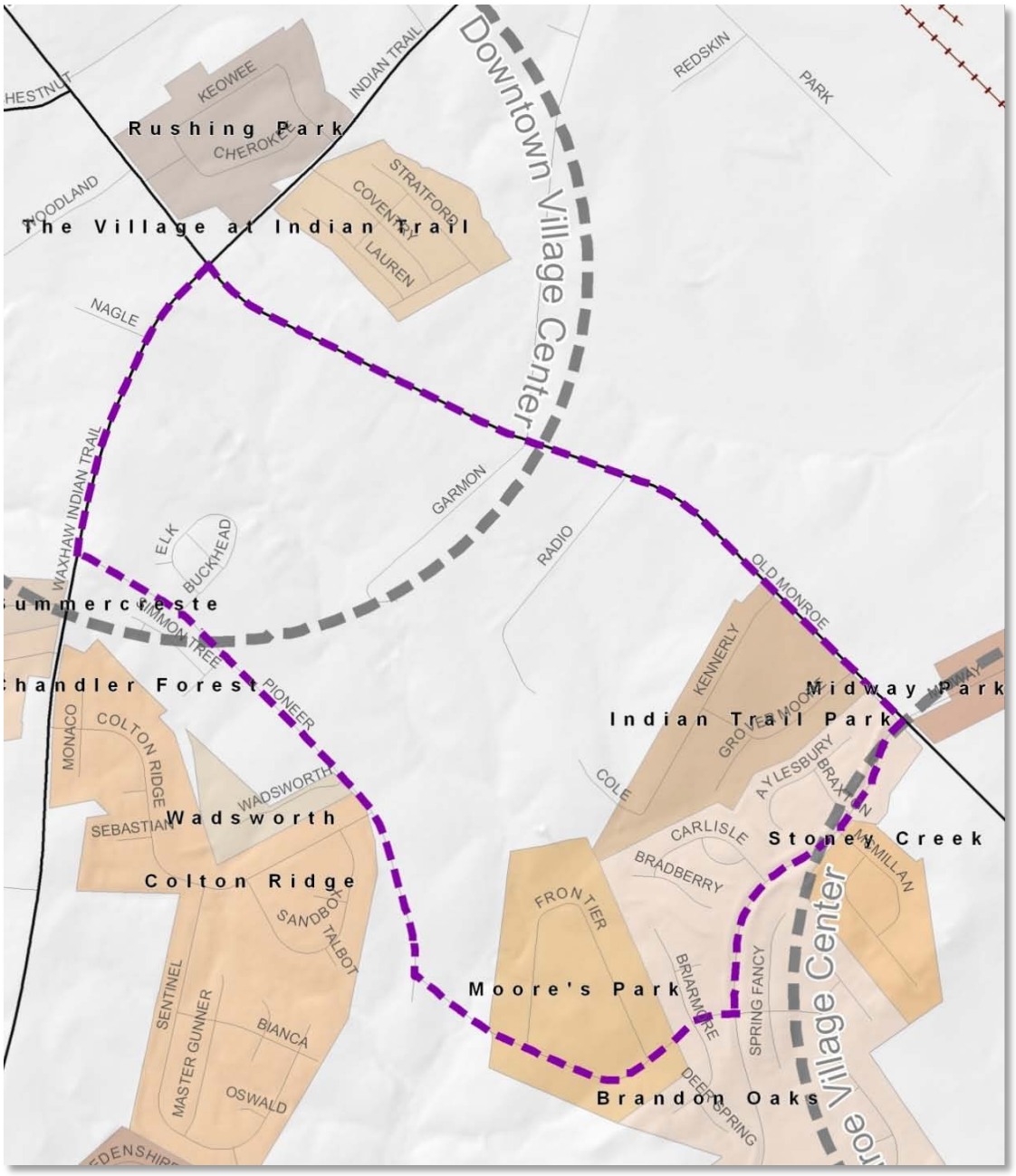
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
1	4	Antioch	Brookhaven	Antioch ES	3.5

Neighborhood Loop #2



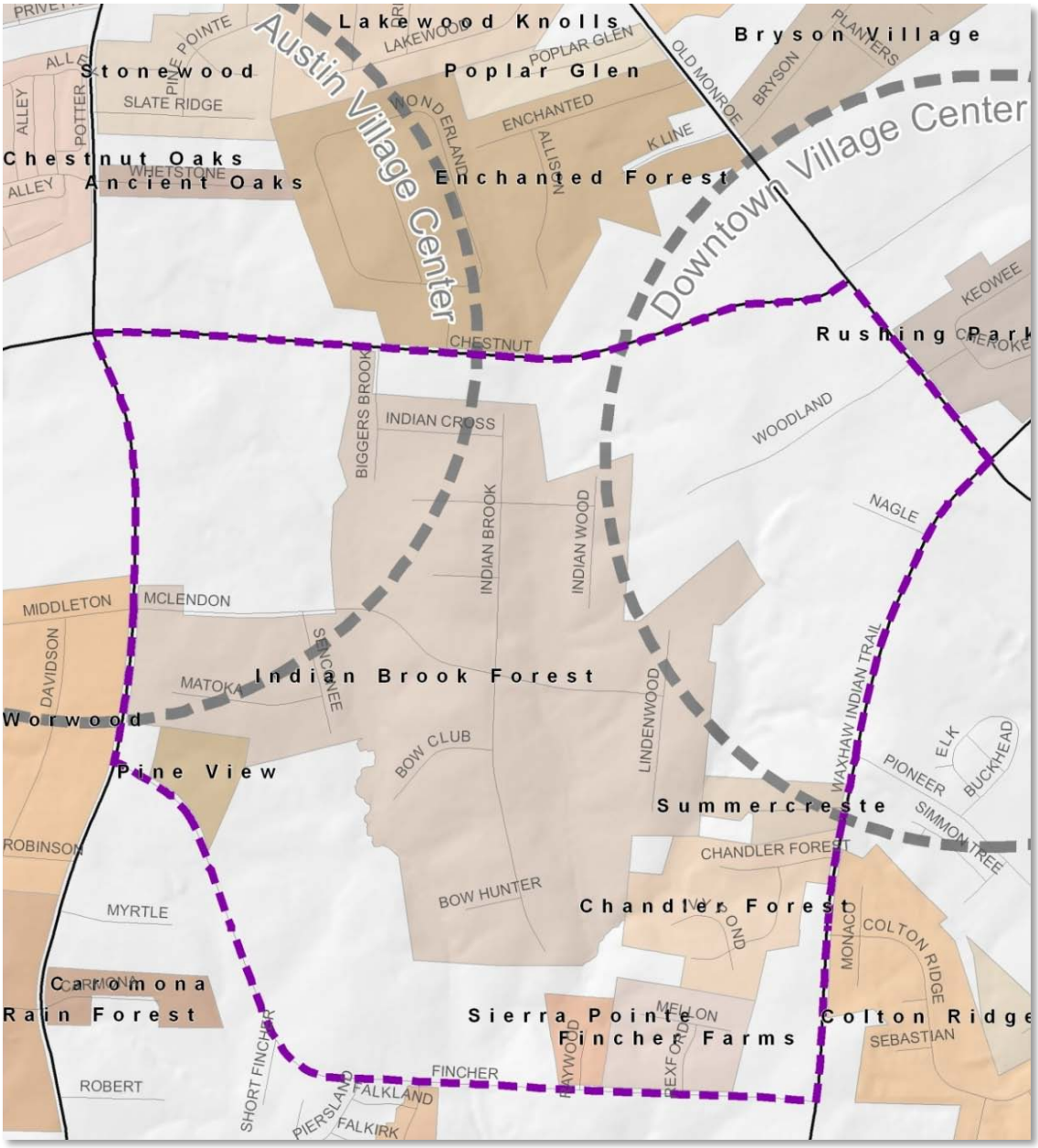
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
2	4	Austin	Brookhaven, Worwood	NA	2.4

Neighborhood Loop #3



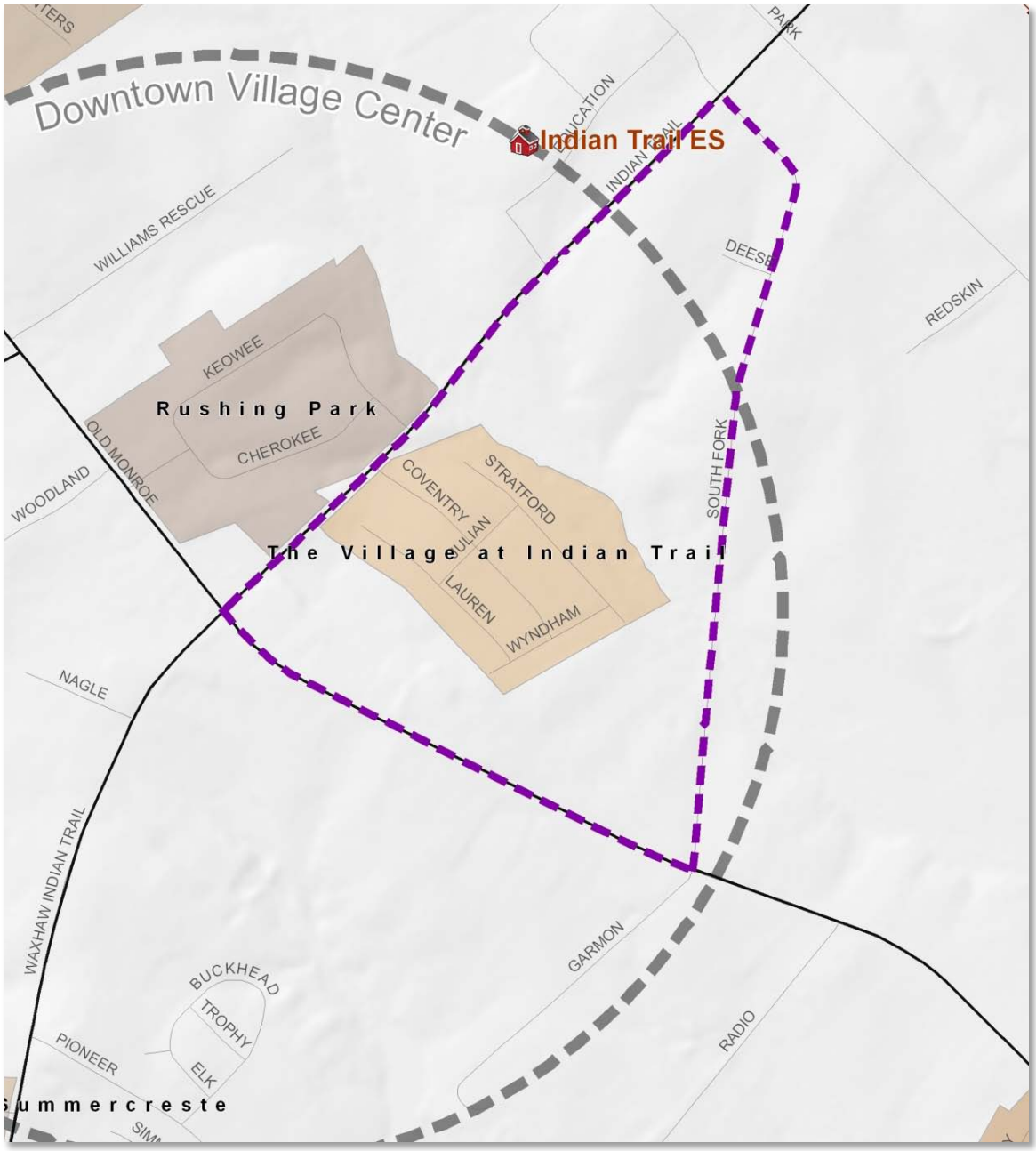
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
3	4	Downtown, Old Monroe	Chandler Forest, Wadsworth, Colton Ridge, Moore's Park, Brandon Oaks, Stoney Creek	NA	3.8

Neighborhood Loop #4



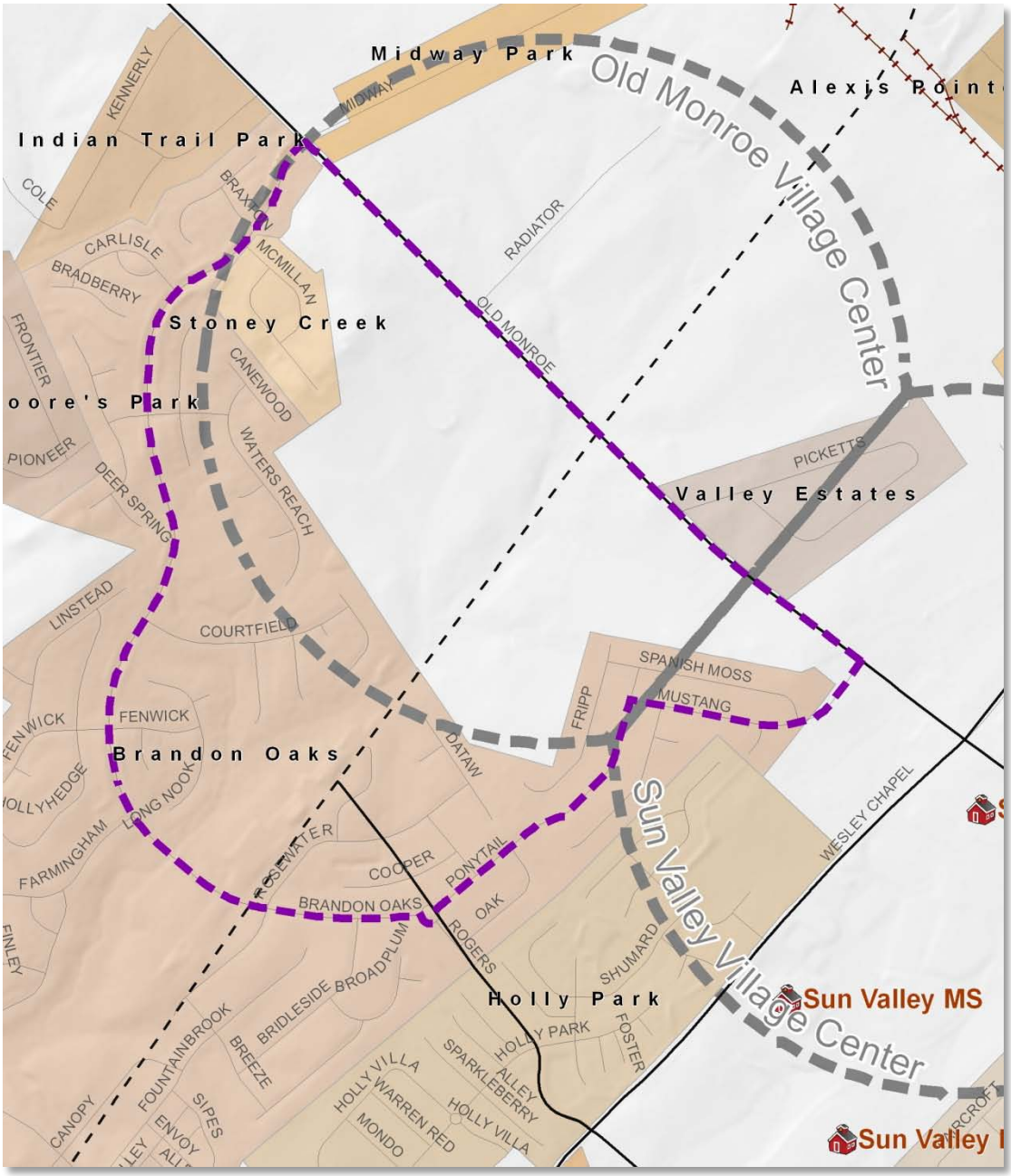
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
4	4	Downtown, Austin	Worwood, Indian Brook Forest, Pine View, Chandler Forest, Summercreste, Sierra Pointe, Fincher Farms, Colton Ridge, Rushing Park, Enchanted Forest, Prestwick	Downtown	3.25

Neighborhood Loop #5



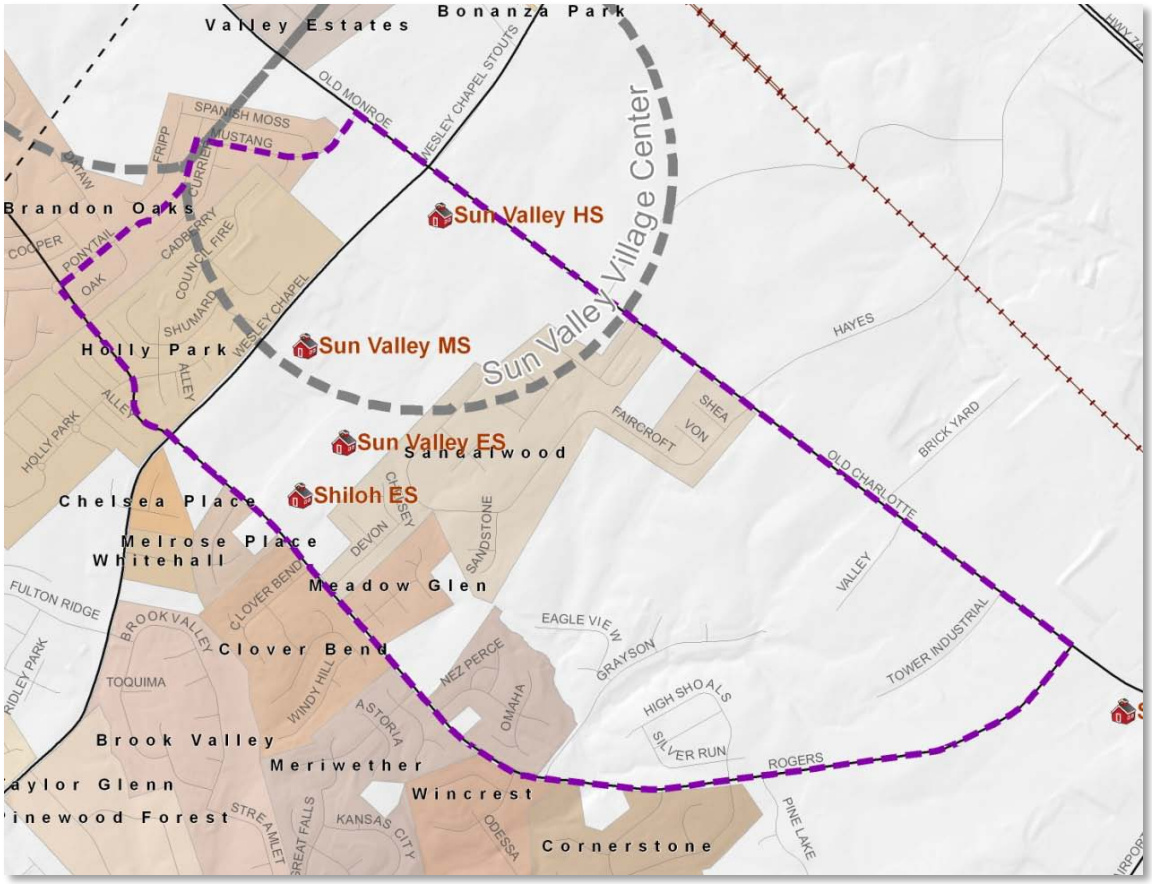
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
5	4	Downtown	The Village at Indian Trail, Rushing Park	Indian Trail E.S.	1.8

Neighborhood Loop #6



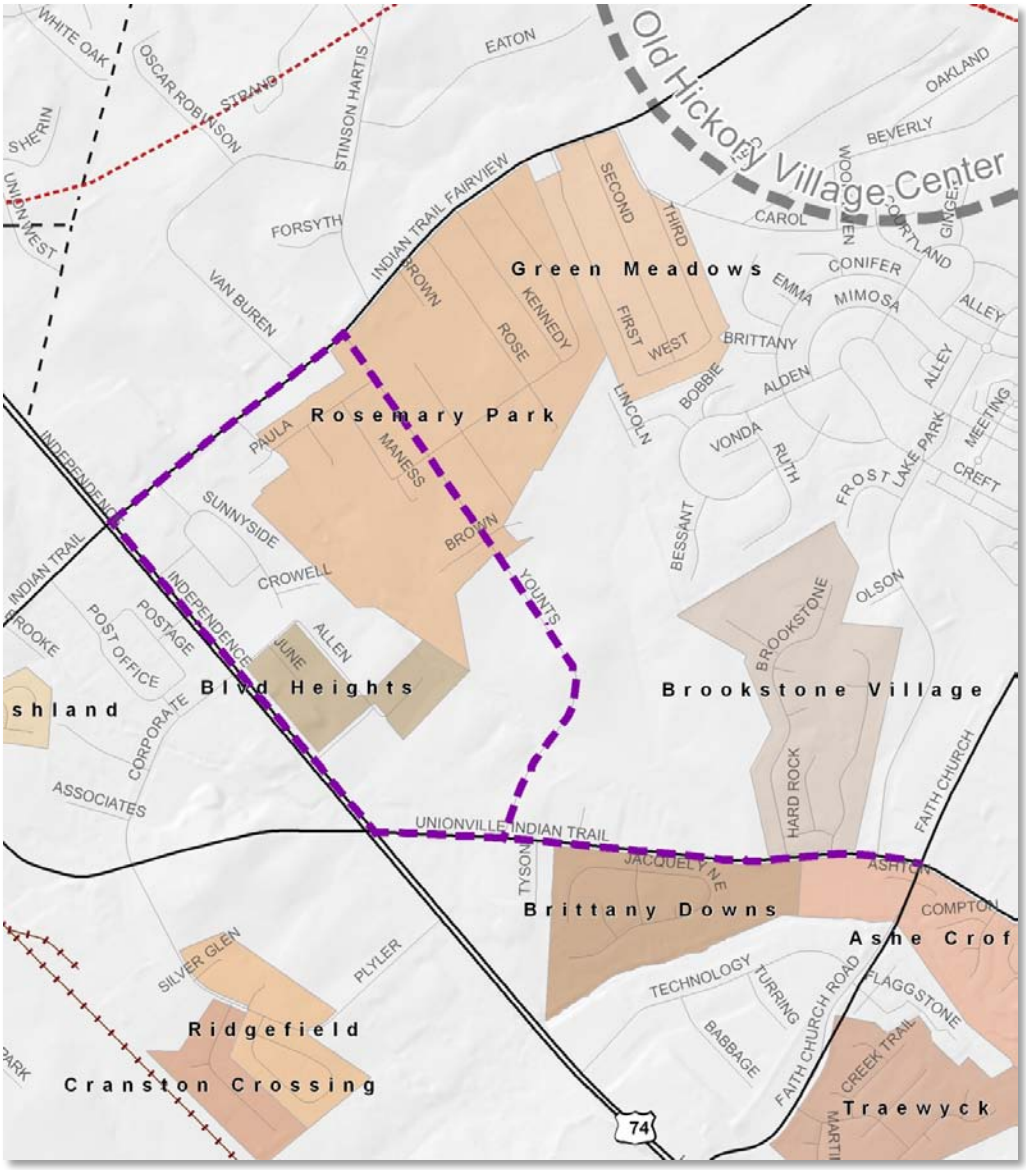
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
6	3, 4	Old Monroe, Sun Valley	Stoney Creek, Moore's Park, Brandon Oaks, Valley Estates, Midway Park	NA	3.4

Neighborhood Loop #7



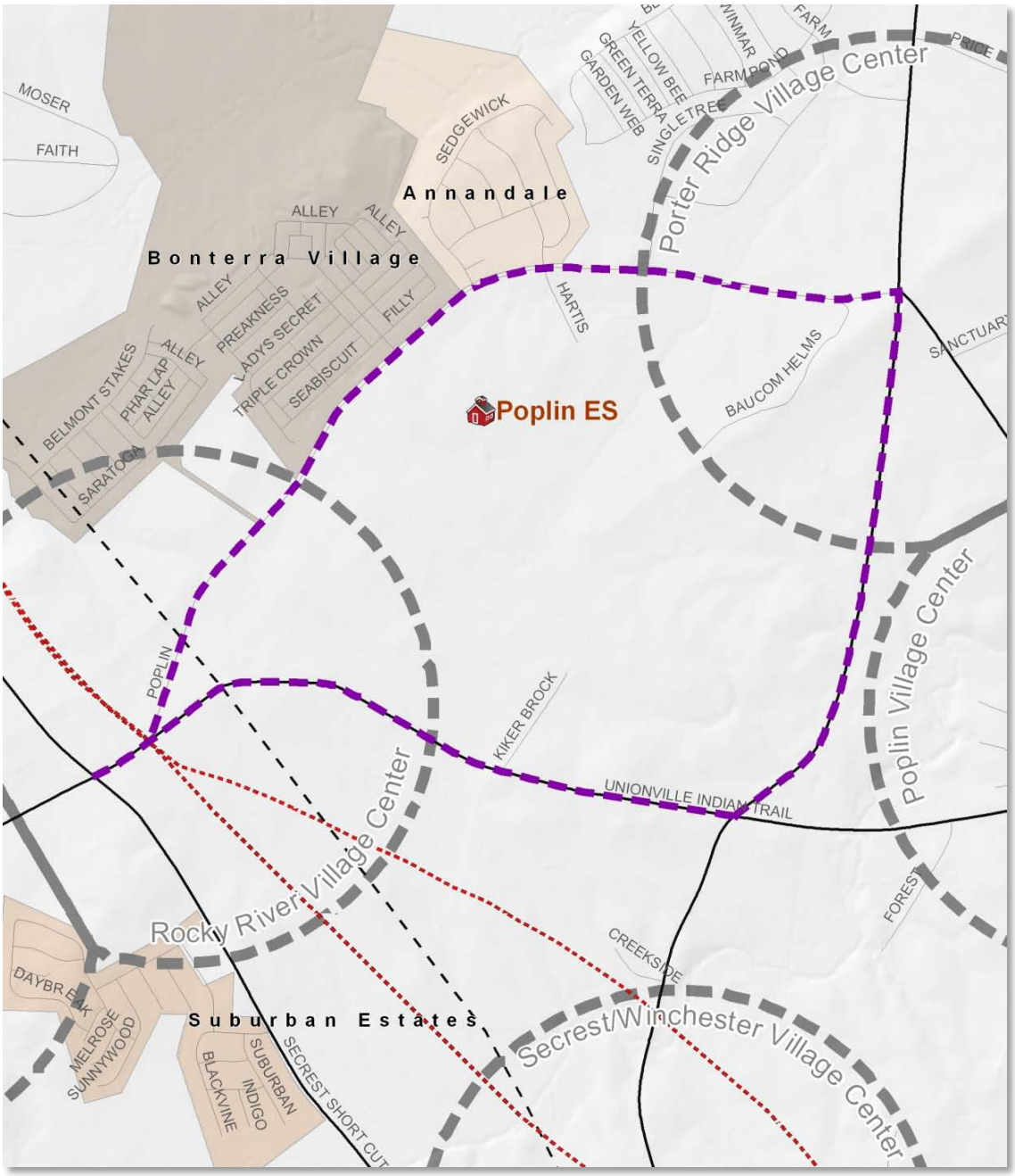
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
7	3	Sun Valley	Brandon Oaks, Holly Park, Melrose Place, Clover Bend, Meadow Glen, Meriwether, Wincrest, Cornerstone, Sandalwood	Sun Valley H.S., Sun Valley M.S., Sun Valley E.S., Shiloh E.S.	5.2

Neighborhood Loop #8



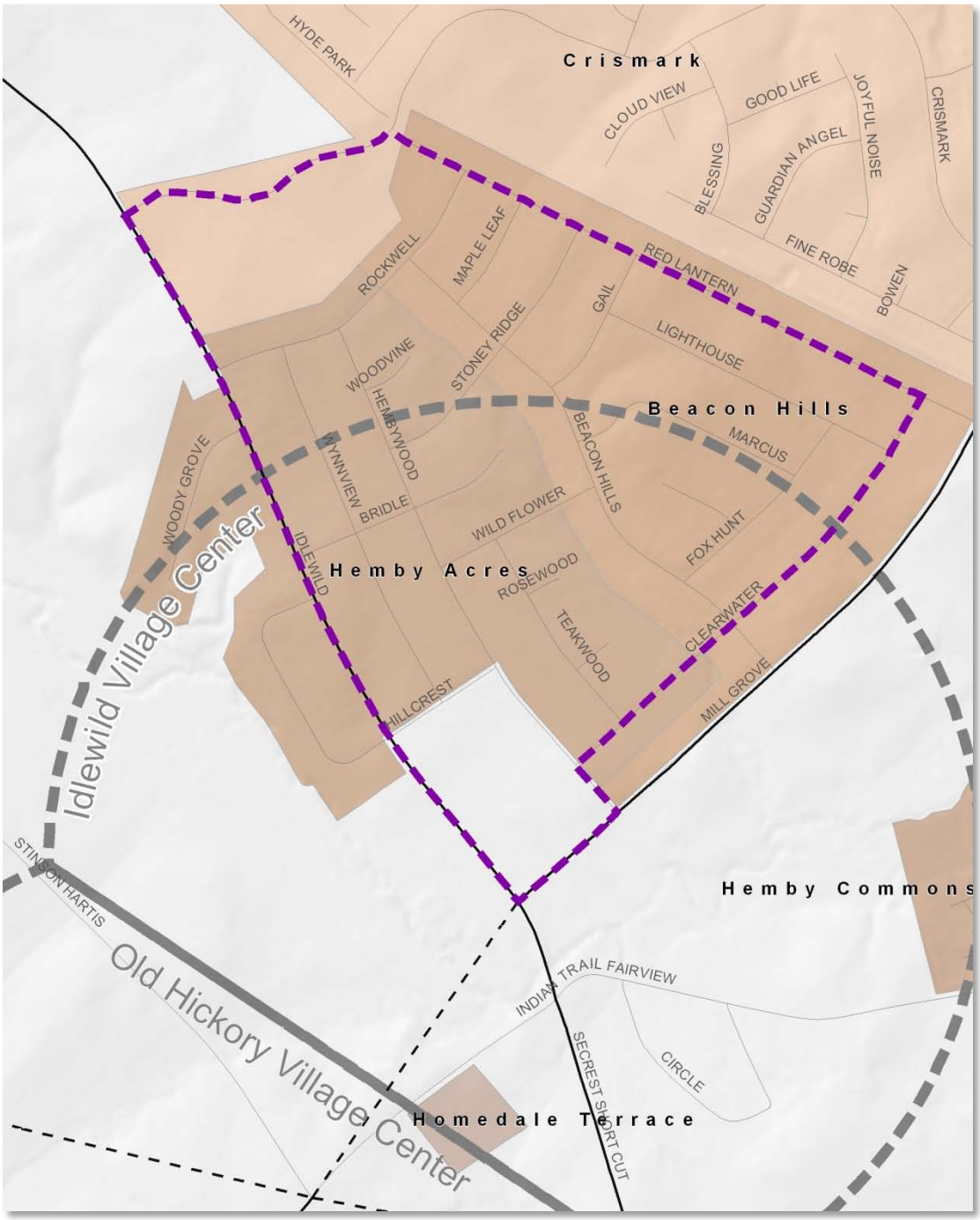
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
8	1	NA	Boulevard Heights, Brittany Downs, Ashe Croft, Rosemary Park	1st Baptist Church, Walmart and other retail/commercial	3.1

Neighborhood Loop #9



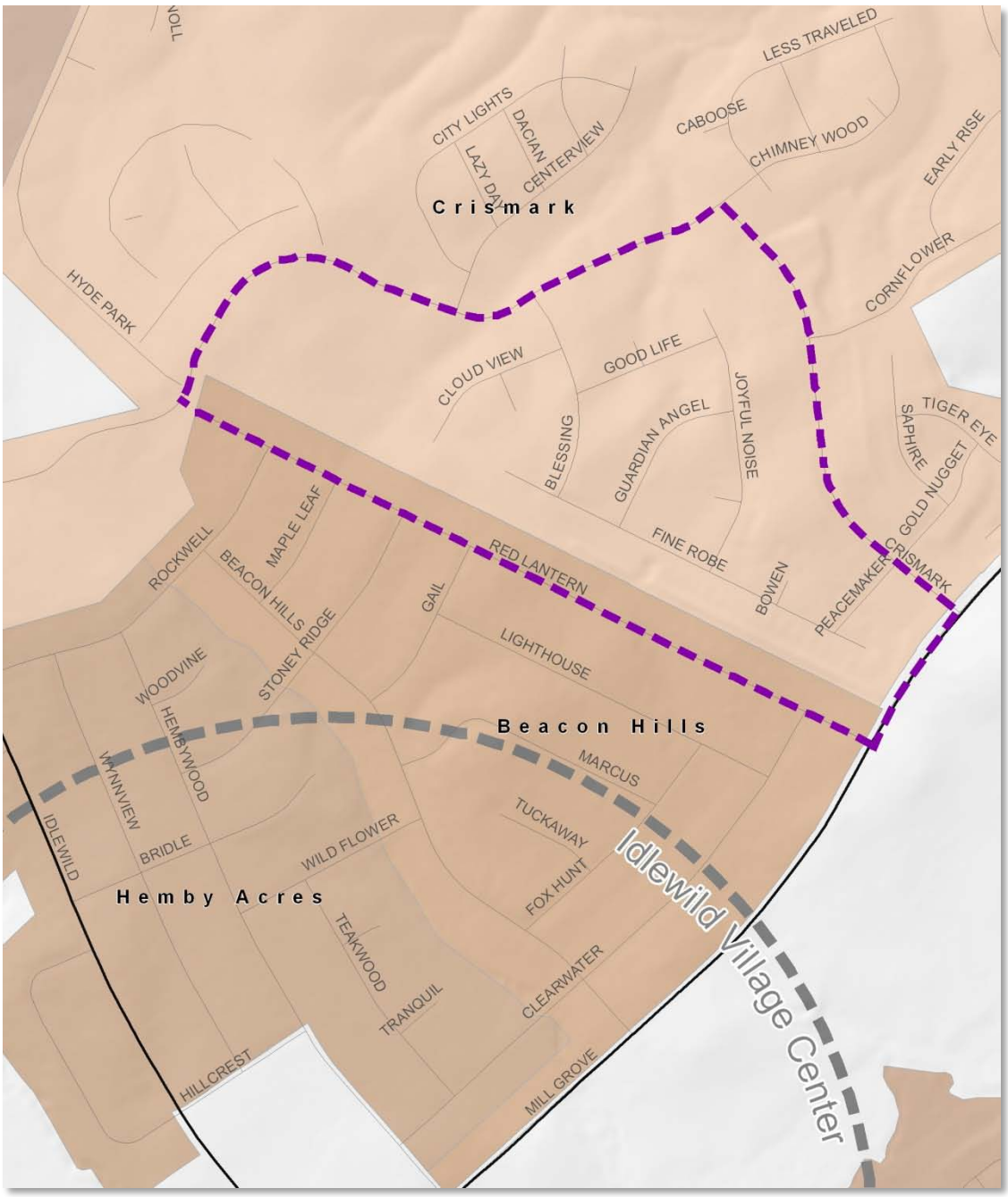
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
9	2	Rocky River, Porter Ridge	Bonterra Village, Annandale	Poplin E.S.	4.4

Neighborhood Loop #10



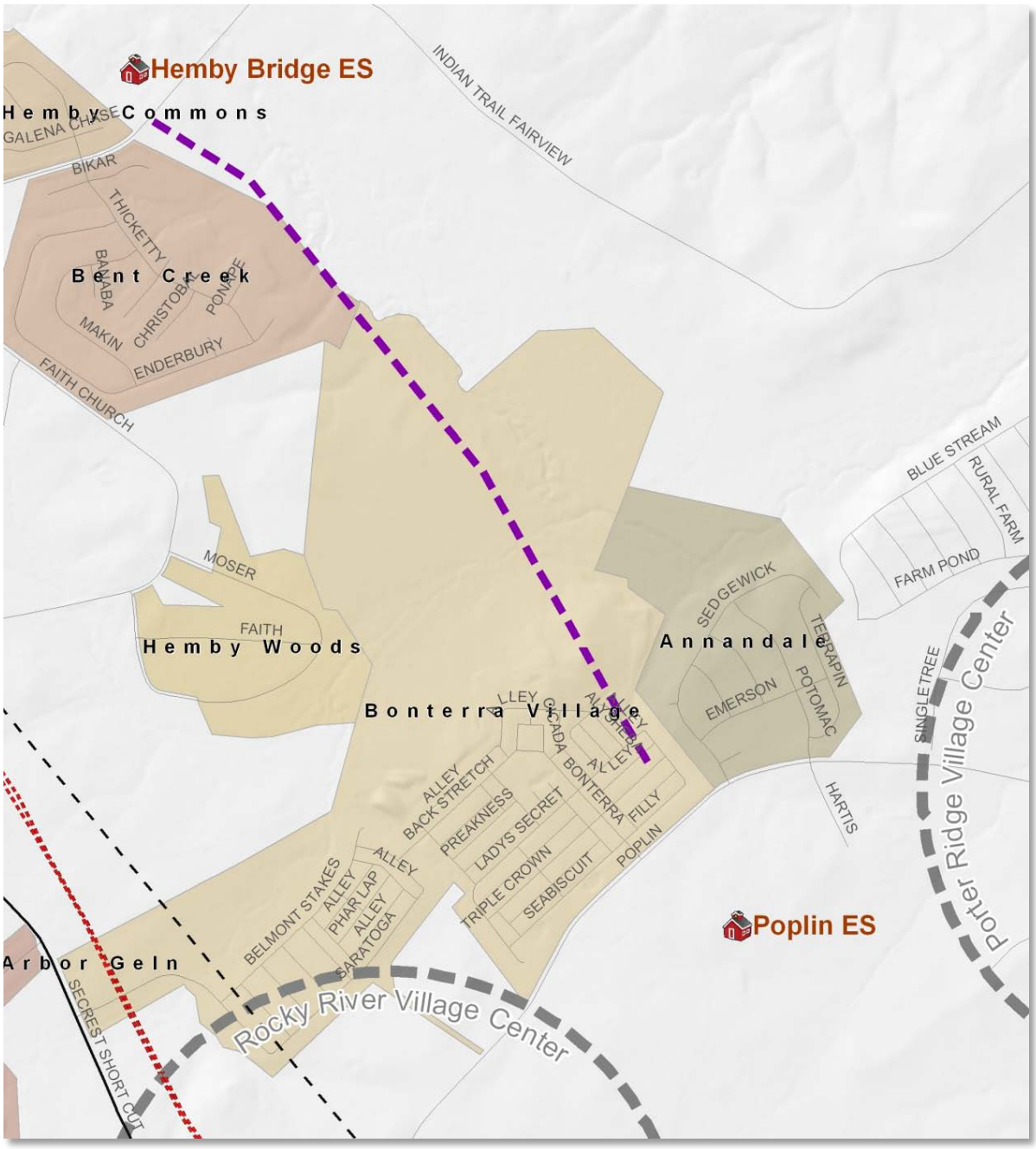
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
10	1	Idlewild	Hemby Acres, Beacon Hills	Food Lion	2.6

Neighborhood Loop #11



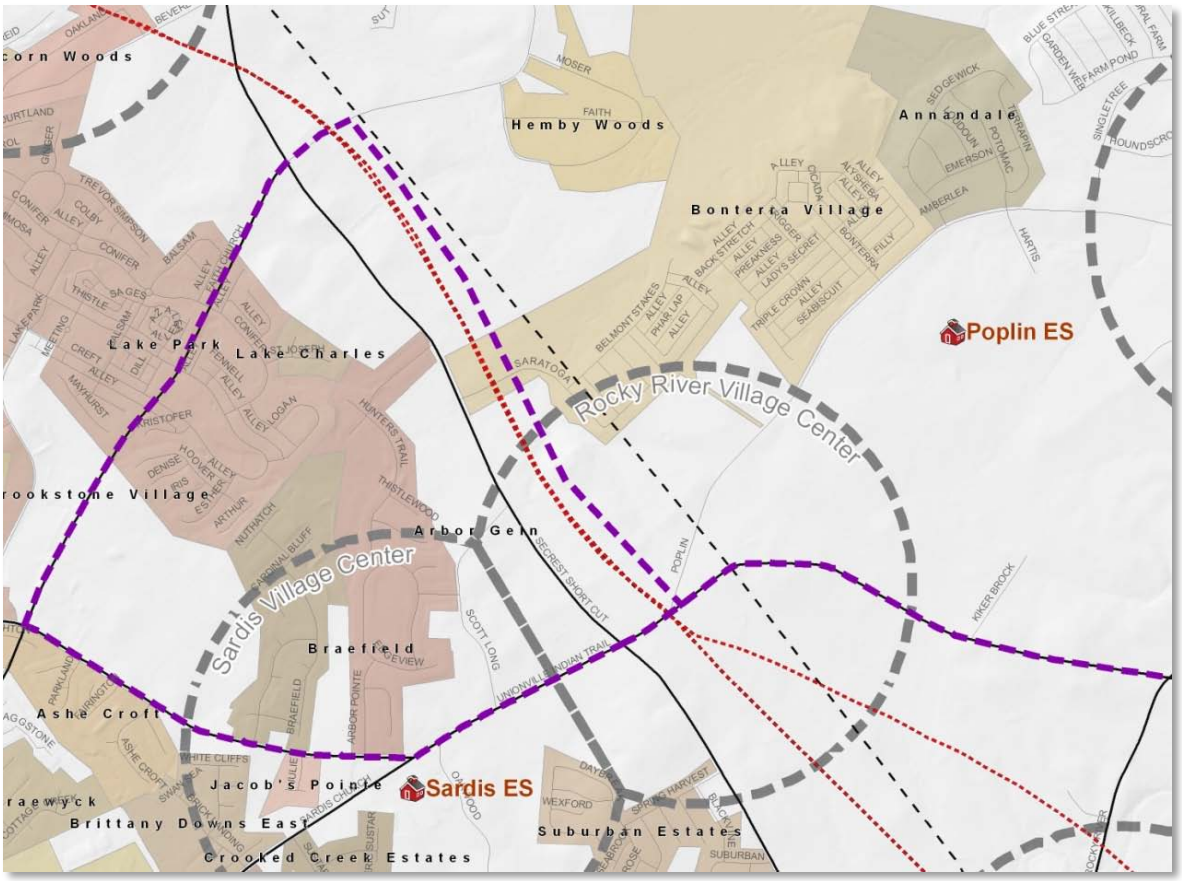
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
11	1	NA	Crismark	NA	1.8

Neighborhood Loop #12



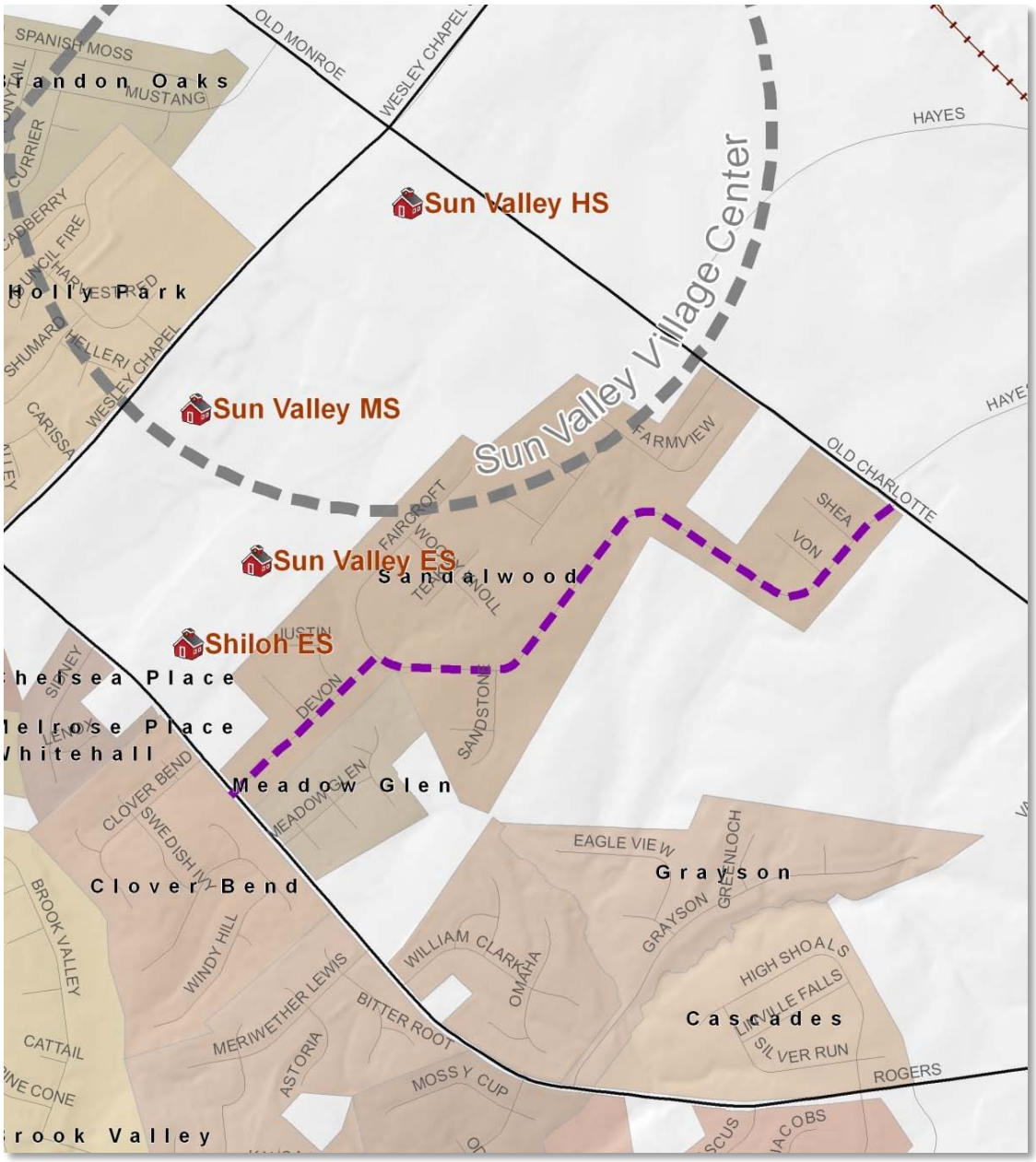
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
12	2	NA	Hemby Commons, Bent Creek, Bonterra Village,	Hemby Bridge E.S.	1.4

Neighborhood Loop #13



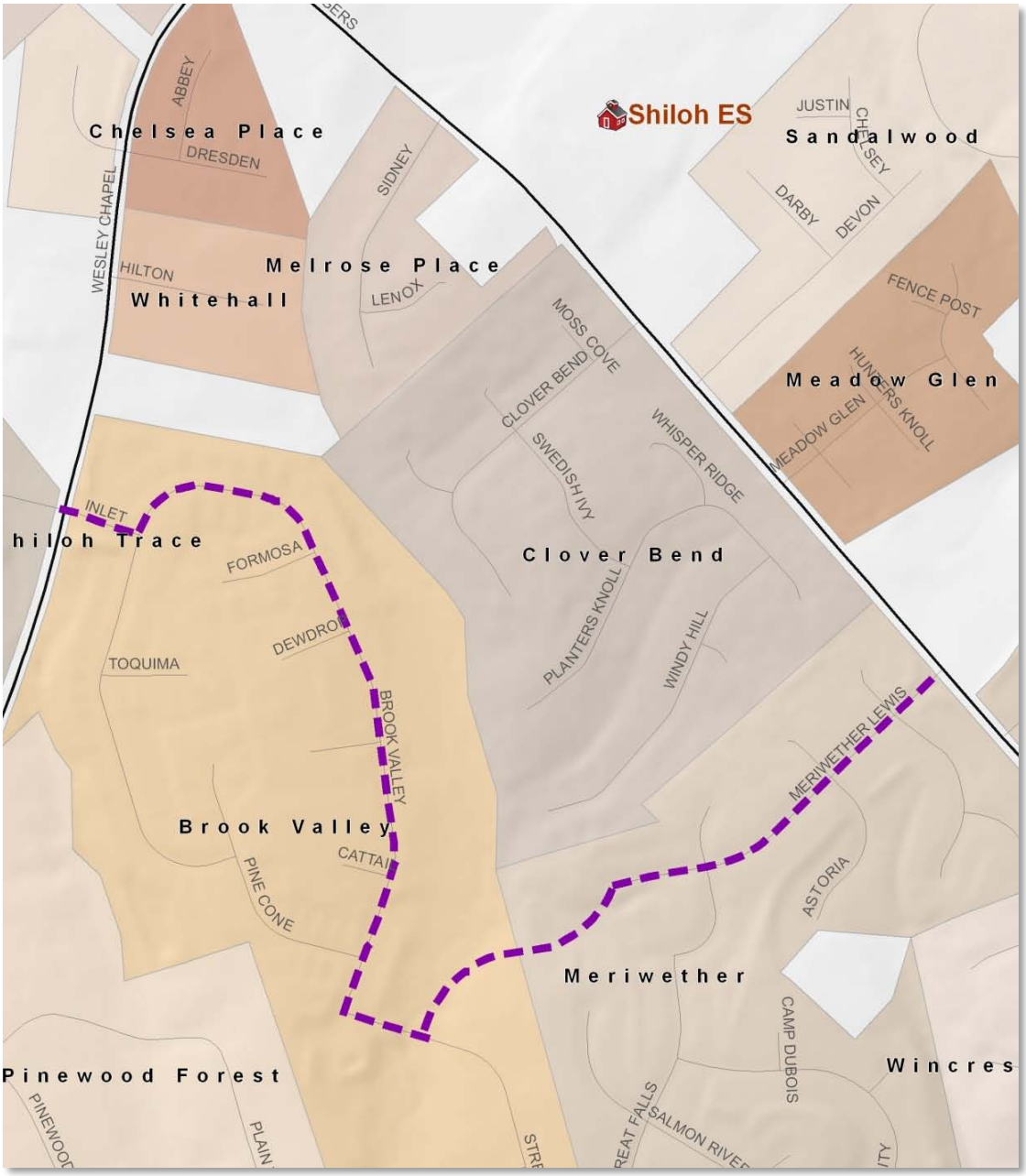
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
13	2	Sardis, Rocky River	Lake Park, Lake Charles, Brookstone Village, Ashe Croft, Jacob's Pointe, Braefield, Arbor Glen, Bonterra Village	Sardis E.S.	2.7

Neighborhood Loop #14



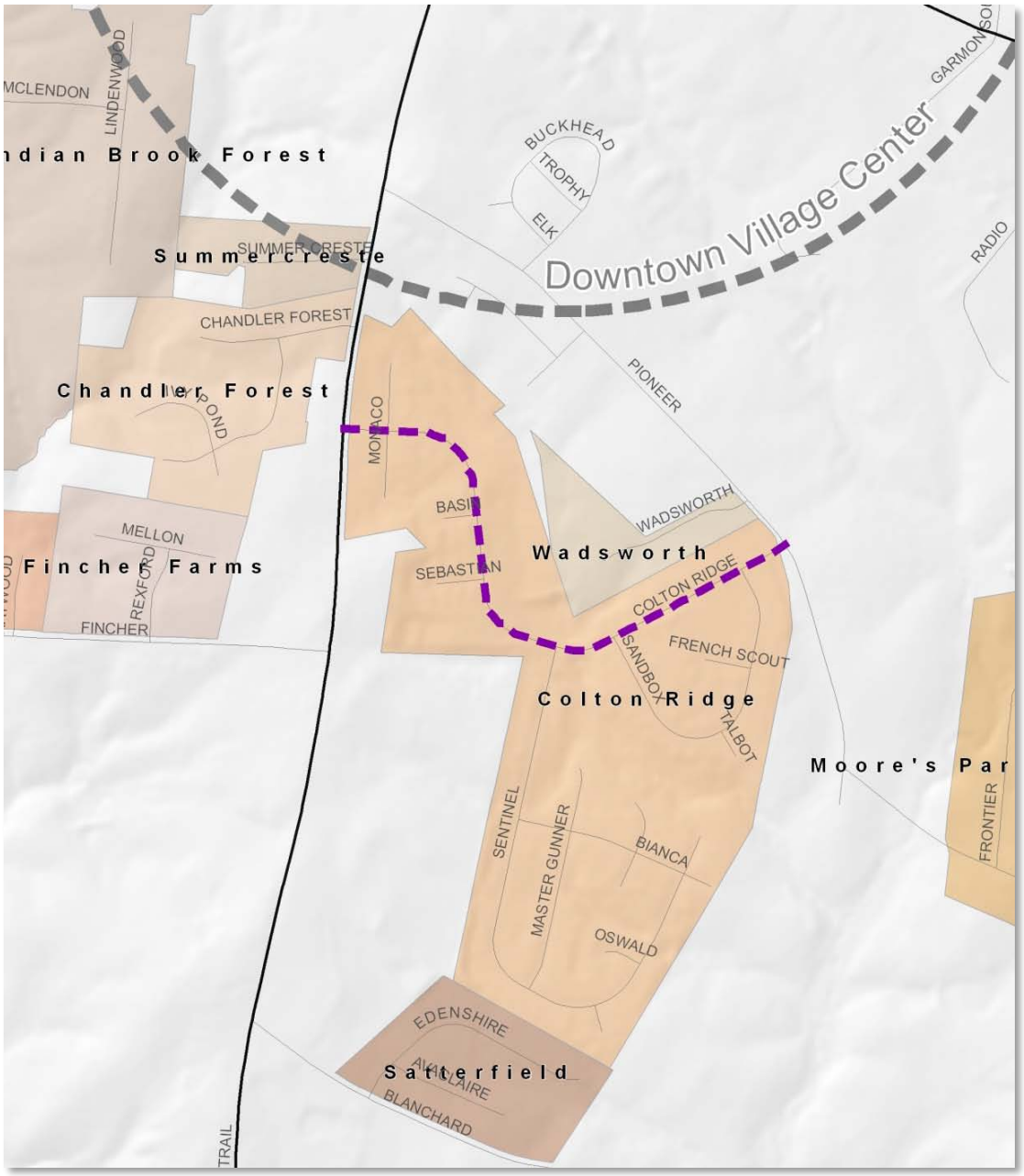
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
14	3	Sun Vlley	Meadow Glen, Sandalwood,	NA	1.1

Neighborhood Loop #15

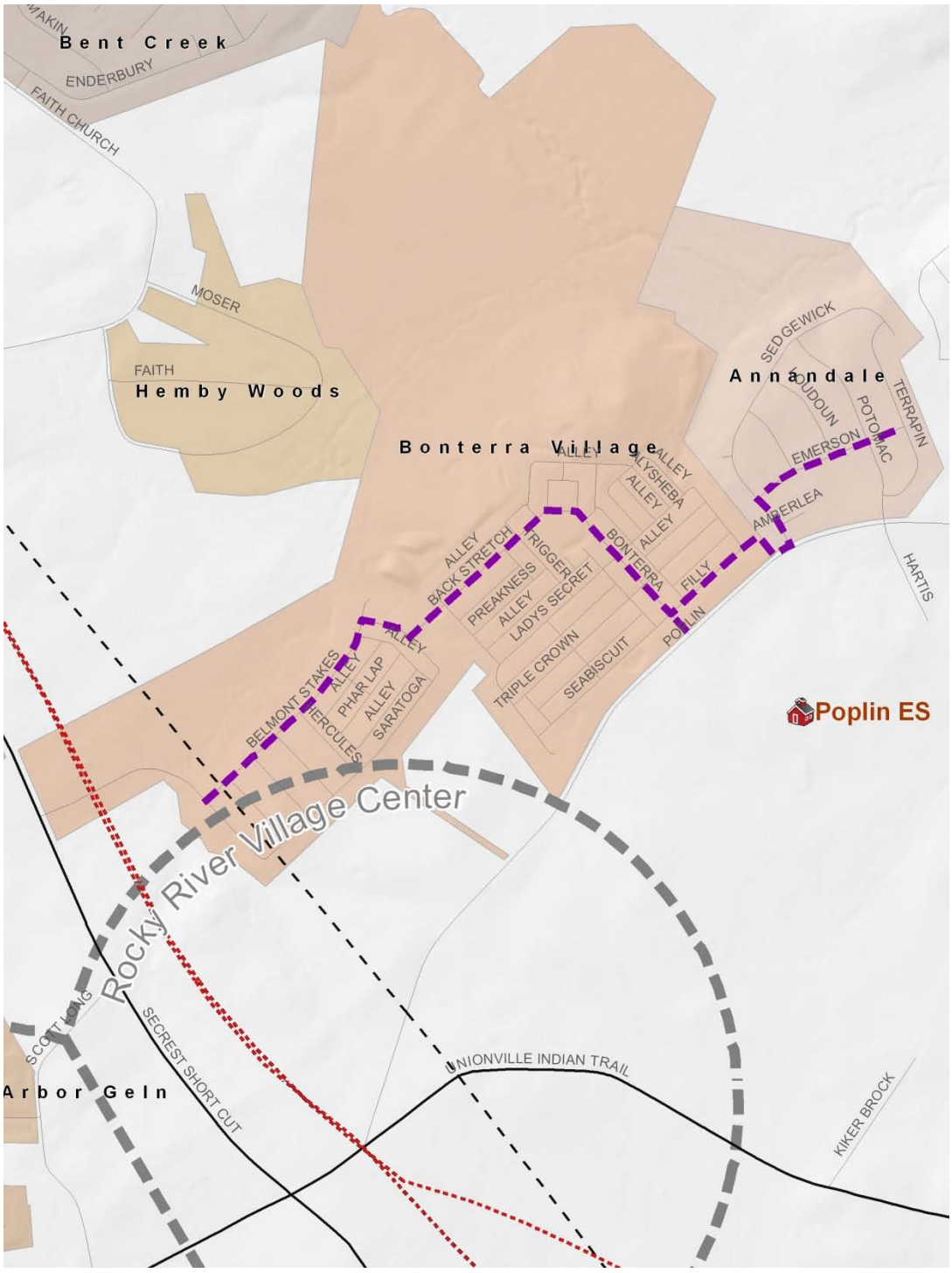


Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
15	3	NA	Brook Valley, Meriwether	NA	1.1

Neighborhood Loop #16

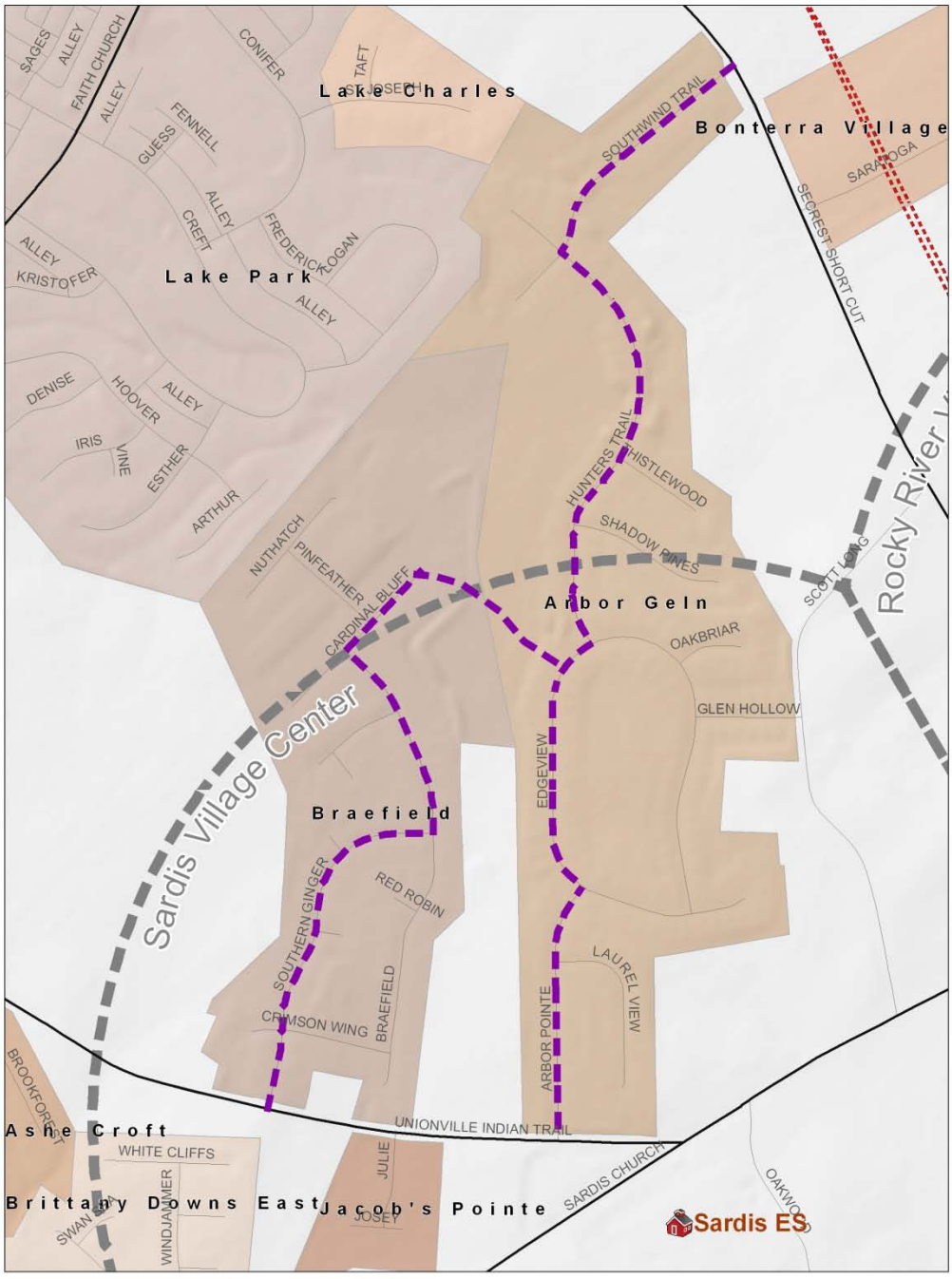


Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
16	4	NA	Colton Ridge	NA	0.6



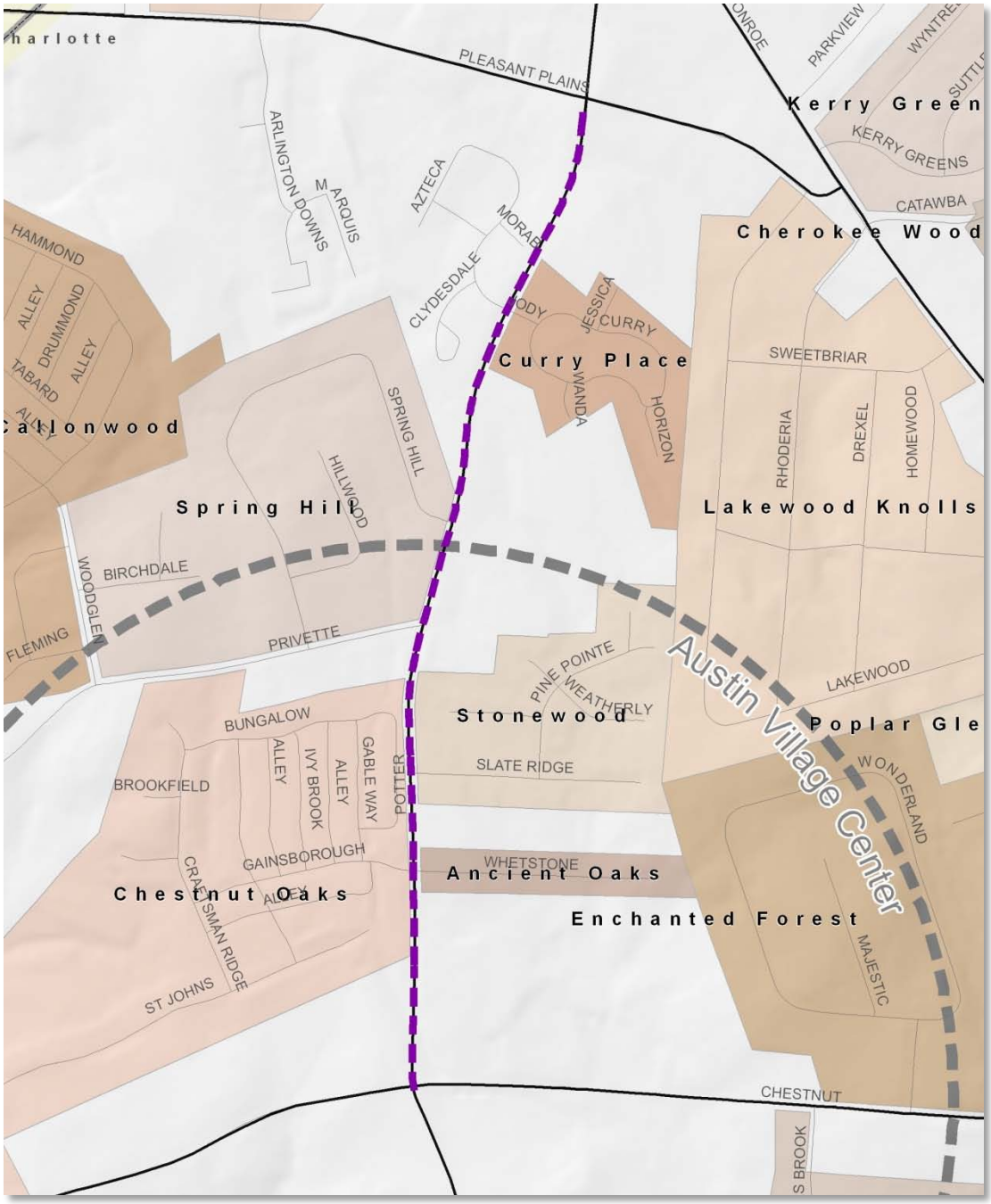
Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
17	2	Rocky River	Bonterra Village, Annandale	Poplin E.S.	1.6

Neighborhood Loop #18



Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
18	2	Sardis	Arbor Glen, Braefield	NA	1.75

Neighborhood Loop #19



Loop Number	Quadrant	Village Center	Neighborhoods Connected	Destinations	Length (miles)
19	4	Austin Village	Chestnut Oaks, Spring Hill, Curry Place, Stonewood Ancient Oaks	NA	0.9

Bike It

Indian Trail Bicycle Master Plan

APPENDIX E

Implementation Matrix

Bike It

Indian Trail Bicycle Master Plan

Actions	Lead	Support	Scheduled Priority	Status
Planning				
Present Plan Recommendations to Planning Board for Endorsement	P&NS	Consultant	Immediate	In-Progress
Present Plan recommendations to Town Council for adoption	P&NS	Consultant	Immediate	In-Progress
Adopt the Bicycle Master Plan	TC	NA	Immediate	In-Progress
Implement Pilot Projects through further planning and design	P&NS	E&PW	Immediate	
Draft a Resurfacing and Restriping Policy that requires the consideration of bicycle facilities (bike lanes, wide shoulders, etc.)	P&NS	TAC	Immediate	
Approve new Resurfacing and Restriping Policy	TC	PB	Immediate	
Incorporate Facility Standards and Guideline (Chapter 5) into the Town's Development Standards	P&NS	E&PW	Immediate	
Add definitions of bicycle facilities to the Town's Unified Development Ordinance	P&NS	TC	Immediate	
Hire an employee to initiate the Town's Parks and Recreation Department	P&NS	TC	Immediate	
Add bicycle facility standards to the Town's Development Standards	P&NS	TC	Immediate	
Meet with Transportation Committee to review the Bicycle Master Plan and their involvement in the implementation of the plan	P&NS	TAC	Immediate	
Establish a tool (online or hot line) to allow bicyclists to report violation incidents	UCSD	P&NS	Short-Term	
Continually assess and evaluate the effectiveness of current bicycle related policies and improve when necessary.	P&NS	TC	On-Going	
Continue to review land development plans for the inclusion of bicycle facilities (i.e. bike lanes, greenways/trails and bicycle parking)	P&NS	PB	On-Going	
Continually assess and evaluate the progress of the Bicycle Master Plan	P&NS	TAC	On-Going	
Funding				
Pursue Safe Routes to School grants for programs and policies	P&NS	TAC	Immediate	
Pursue Safe Routes to School grants for the construction of the pilot projects	P&NS	TAC	Immediate	
Develop a long-term funding strategy (General Fund, Powell Bind Funds, etc) for the development of bicycle facilities	TC	P&NS	Immediate	
Pursue additional grants to implement bicycle programs and projects	P&NS	NCDOT	Short-Term	
Purchase land for the construction of greenways	P&NS	TC	On-Going	
Construction				
Initiate Neighborhood Signed Route installation	E&PW	P&NS	Immediate	
Construct Pilot Projects	E&PW	P&NS	Immediate	
Install bike racks at all municipal buildings, schools and libraries	E&PW	P&NS	On-Going	
Build proposed greenways	E&PW	P&NS	Long-Term	
Include bicycle facilities into the construction of new and reconstructed roadways	NCDOT	E&PW	Long-Term	

Legend

Scheduled Priority

I - Immediate (1-3 years)
S - Short-Term (3-5 years)
M - Mid-Term (5-10 years)
L- Long-Term (over 10 years)
O - On-Going

Agency/Department

P&NS - Neighborhood & Planning Services
TC - Town Council
PB - Planning Board
E&PW - Engineering & Public Works
D - Developers
TAC - Transportation Advisory Committee
LR&AG - Local Residents & Advocacy Groups
UCSD - Union County Sherriff's Department
NCTA - North Carolina Turnpike Authority
NCDOT - North Carolina Department of Transportation
CATS - Charlotte Area Transportation System
CTT - Carolina Thread Trail
COG - Council of Governments
UCPS - Union County Public Schools

Actions	Lead	Support	Scheduled Priority	Status
Maintenance				
Incorporate bicycle maintenance into the Town's maintenance program	E&PW	P&NS	Immediate	
Develop a system for users to be able to call in maintenance concerns	E&PW	P&NS	Short-Term	
Develop street sweeping program	E&PW	P&NS	Short-Term	
Replace any unsafe drainage grates with bicycle safe grates	E&PW	NCDOT	On-Going	
Education/Encouragement				
Develop communication program to educate the community about the Bicycle Plan	P&NS	TAC	Immediate	
Work with local media to raise bicycle safety awareness (helmet use, laws, etc.)	P&NS	UCSD	Short-Term	
Create and update an Indian Trail Bicycle System Map with safety information and bicycle laws	P&NS	TAC	Short-Term	
Continue and expand upon existing bicycle awareness events	P&NS	TAC	On-Going	
Continue to coordinate with Carolina Thread Trail on the development of regional greenway connections	P&NS	CTT	On-Going	
Coordination				
Initiate communication with surrounding municipalities to discuss bicycle related issues and to coordinate on adjacent bicycle projects	P&NS	NA	Immediate	
Initiate discussions with local and regional health organizations to educate community about benefits of bicycling.	P&NS	TAC	Immediate	
Coordinate with NCDOT and the Town's Engineering and Public Works Department to ensure bicycle facilities are incorporated into resurfacing projects	P&NS	NA	Short-Term	
Coordinate with Charlotte Area Transportation System (CATS) to ensure the inclusion of bicycle facilities in any future transit improvement projects	P&NS	E&PW	Short-Term	
Work with Union County Public Schools system to improve pedestrian and bicycle connectivity to schools	P&NS	UCPS	On-Going	
Continue to coordinate with CTT on the development of greenway corridors	P&NS	TAC	On-Going	

Legend

Scheduled Priority

I - Immediate (1-3 years)

S - Short-Term (3-5 years)

M - Mid-Term (5-10 years)

L- Long-Term (over 10 years)

O - On-Going

Agency/Department

P&NS - Neighborhood & Planning Services

TC - Town Council

PB - Planning Board

E&PW - Engineering & Public Works

D - Developers

TAC - Transportation Advisory Committee

LR&AG - Local Residents & Advocacy Groups

UCSD - Union County Sherriff's Department

NCTA - North Carolina Turnpike Authority

NCDOT - North Carolina Department of Transportation

CATS - Charlotte Area Transportation System

CTT - Carolina Thread Trail

COG - Council of Governments

UCPS - Union County Public Schools

APPENDIX F
Pilot Projects

Bike It

Indian Trail Bicycle Master Plan

Idlewild Village Center Connector

RECOMMENDED IMPROVEMENTS:

Signed Routes:

- Crismark Dr., Red Lantern Rd., and Clearwater Dr.

Clearwater Connection:

- Retaining wall, concrete path, handicap ramps, stop sign, stop bar, pedestrian lighting, landscaping and bollards

Red Lantern Connector

- Concrete path, stop sign, stop bar, pedestrian lighting, landscaping and bollards

COST ESTIMATE:
$150,000

RESPONSIBILITY:

- Town of Indian Trail and private developer

Proposed improvments at the end of Clearwater Drive

Proposed improvments between Red Lantern and Crismark Drive

Disclaimer: The cost estimate included is meant to provide some perspective on the order of magnitude. The planning level costs are based on 2010 average construction costs throughout the Charlotte region. An industry-standard construction contingency (30%) was added to the planning level costs. The cost estimate does not include right-of-way acquisition, mobilization, utility relocation, grading, traffic control or other detailed costs that are associated with the preparation of engineering drawings and/or actual construction bids. A more detailed study should be preformed for actual planning, design and construction of these facilities.

Bonterra/Poplin E.S. Connection

RECOMMENDED IMPROVEMENTS:

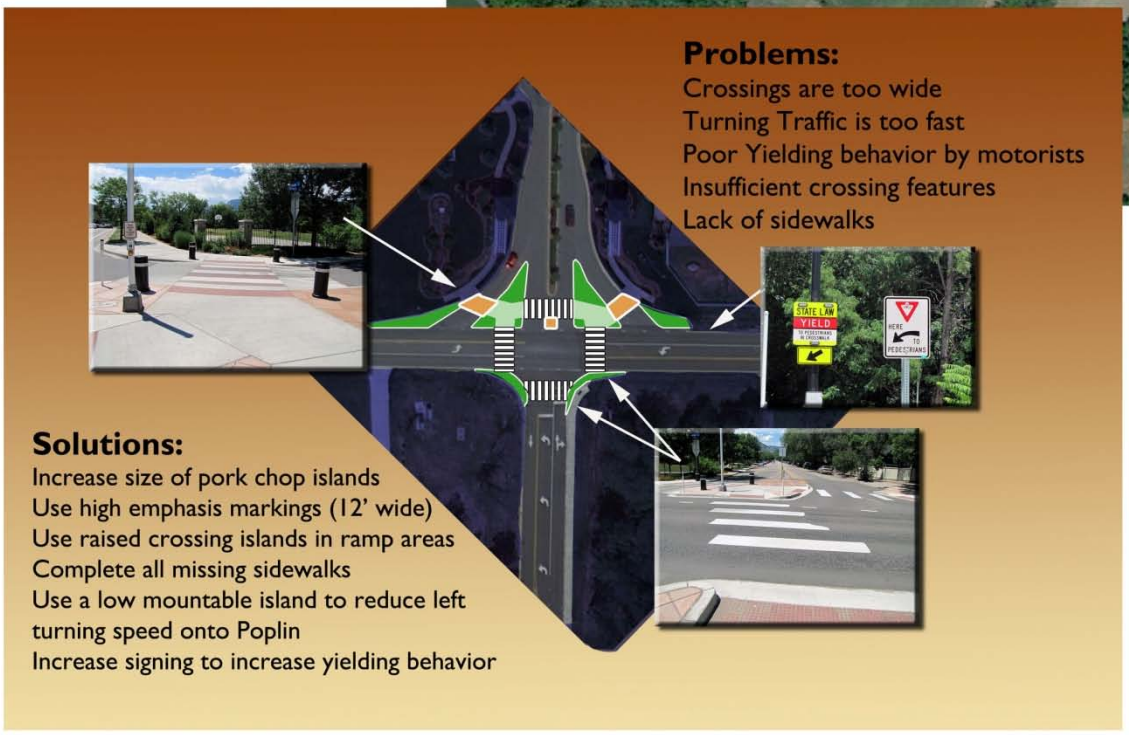
Intersection Improvements

- Install 5" monolithic islands
- Stripe crosswalks with 10-12 foot wide high visibility crosswalks
- Adjust existing handicap ramps to create perpendicular crossings
- Install flashing pedestrian signals for higher visibility
- Modify existing curbs to slow turning movements

COST ESTIMATE:
$200,000

RESPONSIBILITY:

- Town and NCDOT



Disclaimer: The cost estimate included is meant to provide some perspective on the order of magnitude. The planning level costs are based on 2010 average construction costs throughout the Charlotte region. An industry-standard construction contingency (30%) was added to the planning level costs. The cost estimate does not include right-of-way acquisition, mobilization, utility relocation, grading, traffic control or other detailed costs that are associated with the preparation of engineering drawings and/or actual construction bids. A more detailed study should be preformed for actual planning, design and construction of these facilities.

Sun Valley High School Connection

RECOMMENDED IMPROVEMENTS:

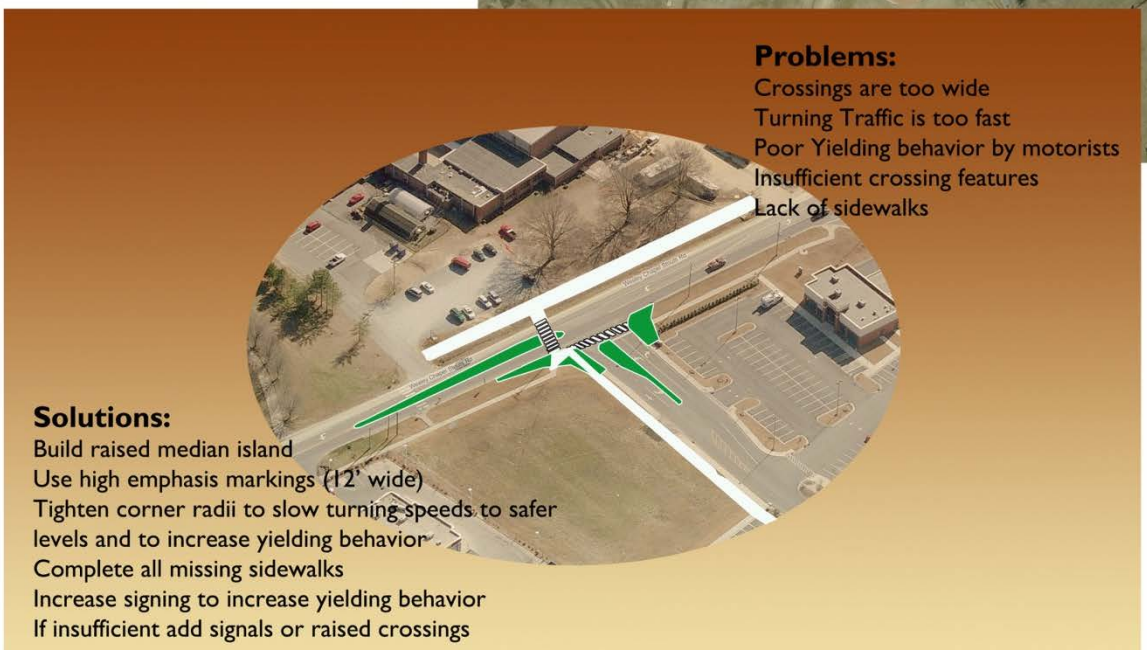
Intersection Improvements

- Install (2) 5" monolithic islands
- Install handicap ramps
- Stripe crosswalks with 10-12 foot wide high visibility crosswalks
- Adjust existing handicap ramps to create perpendicular crossings
- Install flashing pedestrian signals for higher visibility
- Modify existing curbs to slow turning movements
- A crossing guard is also recommended during peak traffic times

COST ESTIMATE:
$230,000

RESPONSIBILITY:

- Town
- NCDOT



Disclaimer: The cost estimate included is meant to provide some perspective on the order of magnitude. The planning level costs are based on 2010 average construction costs throughout the Charlotte region. An industry-standard construction contingency (30%) was added to the planning level costs. The cost estimate does not include right-of-way acquisition, mobilization, utility relocation, grading, traffic control or other detailed costs that are associated with the preparation of engineering drawings and/or actual construction bids. A more detailed study should be preformed for actual planning, design and construction of these facilities.

Brandon Oaks Parkway Bike Lane

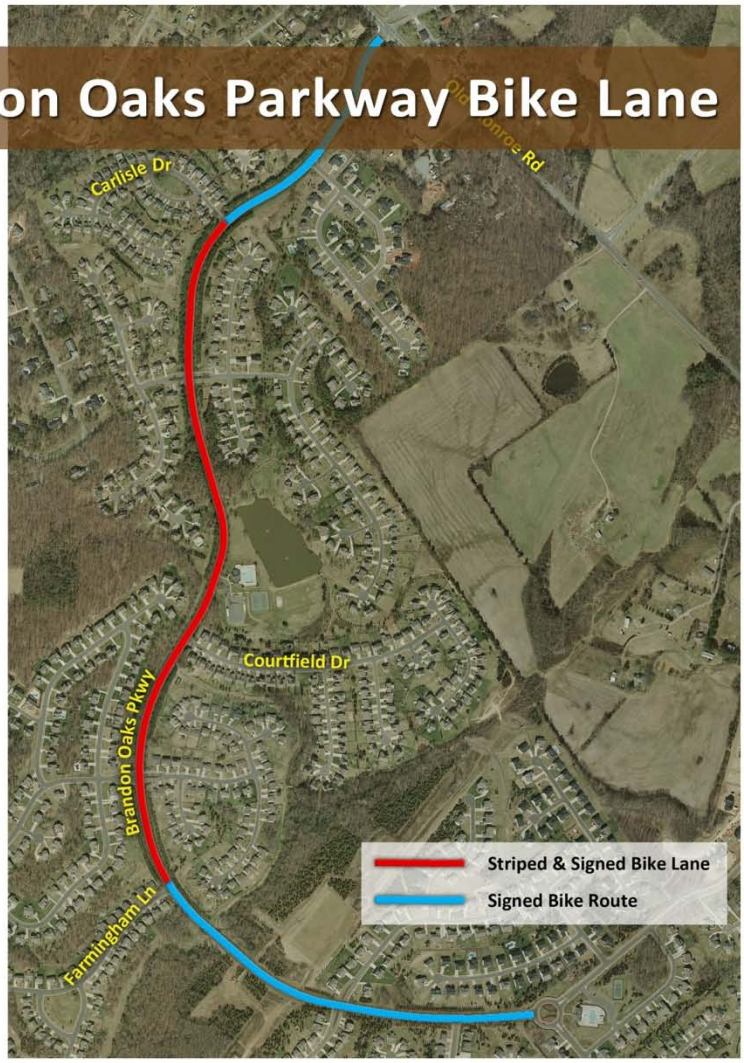
RECOMMENDED IMPROVEMENTS:

Striped Bike Lane

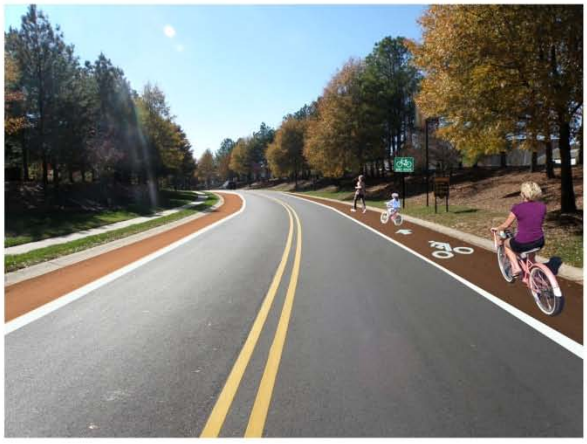
- Install 8-10 inch thermoplastic pavement markings for the bike lanes.
- Colorize bike lane with red tennis court paint to increase the visibility of the bike lane.
- Install the following MUTCD signs:
  - R3-17 along route
  - R3-17 and R3-17aP at the beginning of the route
  - R3-17 and R3-17bP at the end of the route
- Install bike lane pavement symbol markings

COST ESTIMATE:
$205,000

RESPONSIBILITY:
- Town



Existing conditions on Brandon Oaks Pkwy



Proposed bike lane treatment along Brandon Oaks Pkwy

Disclaimer: The cost estimate included is meant to provide some perspective on the order of magnitude. The planning level costs are based on 2010 average construction costs throughout the Charlotte region. An industry-standard construction contingency (30%) was added to the planning level costs. The cost estimate does not include right-of-way acquisition, mobilization, utility relocation, grading, traffic control or other detailed costs that are associated with the preparation of engineering drawings and/or actual construction bids. A more detailed study should be preformed for actual planning, design and construction of these facilities.

APPENDIX G
Funding Sources

Bike It

Indian Trail Bicycle Master Plan

G.1 Overview

The intent of this appendix is to identify various funding opportunities that the Town of Indian Trail can use for the planning, design and construction of bicycle improvement projects as well as educational programs. Perhaps one of the most important recommendations and future funding sources is a dedicated local funding source that the Town can create for the development of bicycle and greenway improvements.

G.2 Funding Opportunities

There are several opportunities that the Town of Indian Trail can capitalize on to help pay for the pedestrian improvements outlined in this report. The following provides a summary of the various local, state and federal funding sources that are available for the Town to use. The list below represents many of the core funding strategies that are available, but is by no means an exhaustive list of funding sources. There are many other sources available that should be researched and pursued as well.

G.2.1 Local Funding

The Town Council has various funding mechanisms available for all town expenses, including the Bike Plan. Every year during the annual budget process, the Town Manager and Staff make recommendations to Council regarding sources and uses of town funds. These funds include general funds derived from various sources such as tax levies, which includes a portion for local parks and road improvements. Other local funds received by the Town from the State are Powell Bill funds for the development of road improvements, sidewalks, bike lanes and traffic control devices. Each year the Town Council takes every town need into consideration for all of these funding sources and adopts a budget ordinance for the upcoming year. The Bike Plan would be among the cost considered by Town Council during this process.

Local Parks Fund

The Park Fund is a ½ cent property tax that was enacted in 2008. These funds are for the development of park facilities, such as greenways.

Local Road Improvement Fund

This is a 2 cent property tax that must be tied to a roadway improvement project. These funds are authorized by the Town Council, and can be used for sidewalk, intersection improvements, and mid-block crossings. This fund has been considered for the development of the pilot projects that have been identified in this plan, especially the intersections around Bonterra and Sun Valley High School.

Powell Bill Fund

The Powell Bill Funds are provided to the Town by the State based on its miles of maintained roads and population. This is an annual allocation program that the local municipality has considerable control over. These funds can be used for the development of sidewalks, bike lanes and traffic control devices. However, budgetary constraints have restricted the use of these funds to maintenance and operation of existing facilities. This would be a good opportunity to fund potential expansion of the multi-use path along US 74.

G.2.2 State Funding

There are several state funding sources that can be used to implement the Bicycle Master Plan. Many of the state funding sources are actually funded by the federal government, but are administered through the state agencies. The North Carolina Department of Transportation Division of Bicycle and Pedestrian Transportation has been funding pedestrian and bicycle related infrastructure and non-infrastructure projects.

Safe Routes to Schools Program

Safe Routes to School (SRTS) is a program that enables and encourages children to walk and bike to school. The program helps make walking and bicycling to school a safe and more appealing transportation option for children. It facilitates the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of school. The Safe Routes to Schools Program is funded through SAFETEA-LU and currently the State of North Carolina has over $4 million of total funding for this program. The following provides some information about the program and how it can be used to improve pedestrian safety in Indian Trail.

Different types of grants are available through this program; these include ***Action Plans, Non-Infrastructure Grant Reimbursement, Infrastructure Grant Reimbursement, and Highway Division Funds***.

- ***Action Plans:*** are awarded in the amount of $15,000-$30,000 to develop plans to improve pedestrian and bicycle safety and usability within a two-mile radius of schools (up to five) that are grades K-8. The State has a total of $300,000 in this program to award to communities around the state.
- ***Non-Infrastructure Grants:*** are awarded in the amount of $10,000-$50,000 and are usable for pedestrian and bicycle education, encouragement, and enforcement. These grants are good for developing programs that encourage children to walk and bike to school.

- ***Infrastructure Grants:*** are funds that are awarded for the planning, design, and construction of pedestrian and bicycling facilities within a 2-mile radius of a school. Funding requests may range from $100,000 to $300,000 per project. The total does not have to be spent on one project. Any agency that is willing and able to enter into a reimbursement agreement with NCDOT and has the authority to construct and/or install and maintain infrastructure is eligible to apply. Types of projects that are eligible may include sidewalk improvements, crossing improvements, on-street bike and pedestrian improvements, bike parking, traffic calming, and traffic separation devices among others. An adopted Action Plan that identifies needed infrastructure improvements is helpful in obtaining these grants.
- ***Highway Division Funds:*** are funds that are allocated to each of NCDOT's 14 Highway Divisions to fund infrastructure projects on state-maintained roadways. The projects must be within 2-miles of a school serving grades K-8 to be eligible. The grants range from $10,000-$50,000 and can be used to improve conditions for walking and biking to school. Typically these grants are used for the following: sidewalks, traffic-calming, on-road bicycling and pedestrian infrastructure and may be included in the Transportation Improvement Program (TIP) as part of the highway construction project. The Town coordinates with the Mecklenburg-Union Metropolitan Planning Organization (MUMPO). Transportation improvement projects can include bicycle and pedestrian projects. These projects are then placed on a list that contains projects from other municipalities in order to compete for potential funding. The timeline for the current STIP is 2009-2015. MUMPO is currently in the process of developing its 2012-2018 TIP in conjunction with NCDOT.

Bicycle related projects are eligible for funding from this program as independent projects, such as greenways or neighborhood connectors which are separate from a roadway construction or widening project. There are two categories for funding of bicycle and pedestrian projects.

- ***Independent Projects:*** are projects that occur independently of scheduled highway projects.
- ***Incidental Projects:*** are projects that occur as part of a scheduled highway improvement project. Bicycle related improvements, such as bike lanes, widened paved shoulders and bicycle-safe drainage grates are typically included in highway improvement projects.

Governor's Highway Safety Program (GHSP)

The GHSP provides funds for pedestrian and bicycle related initiatives upon approval. This is an annual program and the amounts of the funds vary from year to year, according to the specific amounts requested.

North Carolina Parks and Recreation Trust Fund (PARTF)

In 1994 the North Carolina General Assembly established the Parks and Recreation Trust Fund (PARTF). PARTF was established to fund improvements in the state's park system, to fund grants for local governments and to increase the public's access to the state's beaches. PARTF funds are used to acquire, build, and renovate parks. They provide a dollar-for-dollar match up to $500,000. The Town should apply for this grant money to build greenways and other recreational facilities that serve the general public. To find out more information about the PARTF program, please visit the following web page http://www.ncparks.gov/About/grants/partf_main.php.

The North Carolina Conservation Tax Credit Program

North Carolina recognizes the importance of land conservation to its economy, and offers a tax credit program to promote conservation of ecosystem functions (fish and wildlife conservation and conservation of natural areas), ecosystem services (farmland conservation) and other public benefits (public access to public trails, waters, and beaches). This program is managed by the North Carolina Department of Environment and Natural Resources and provides an incentive (in the form of an income tax credit) for landowners who donate interest in real property for conservation purposes. Property donations can be fee simple or in the form of conservation easements or bargain sale. More information on this program can be obtained at the following web page:

http://www.onencnaturally.org/pages/ConservationTaxCredit.html

North Carolina Trails Program

This program is administered through the North Carolina Division of Parks and Recreation. The program originated in 1973 and is dedicated to helping citizens, organizations and agencies plan, develop and manage all types of trails. The NCDPR offers two grant programs. The first is the Adopt-A-Trail Grant and the other is the Recreational Trails Program Grant.

G.3 National Funding Sources

There are a wide range of national funding opportunities that can be used for the development of bicycle facilities. The following list represents the most widely referenced and used.

G.3.1 Transportation Enhancement Program

The Transportation Enhancements Program, which is administered through the FHWA, provides funding for the implementation of bicycle and pedestrian facilities, landscaping and aesthetic improvements. Eligible bicycle improvement projects include:

- Construction of new sidewalks, separate walking trails/paths, bike paths
- Adding and/or modifying bike lanes on existing roadways, and related striping
- Adding and/or modifying road shoulders to accommodate bicyclists
- Installation of items at inter-modal points and vehicular parking facilities such as: bike lockers, bike racks and facilities for bikes on buses and trains

In addition to physical improvement projects, there are safety programs and materials that are allowable. These include:

- Bike/pedestrian safety training
- Related training material such as brochures

Additional information can be obtained at the NCDOT Enhancement Program web page at: http://www.ncdot.gov/programs/Enhancement/

G.3.2 Congestion Mitigation & Air Quality Improvement Program

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) provides 6 billion dollars in funding for surface transportation and other related projects that contribute to air quality improvements and reduce congestion. The Town has actively pursued and received CMAQ funding and should continue to do so in the future. To find more information regarding CMAQ funding, please use the following link:

http://www.fhwa.dot.gov/environment/air_quality/cmaq/index.cfm

Bike It

Indian Trail Bicycle Master Plan

APPENDIX H
Terminology

Bike It

Indian Trail Bicycle Master Plan

AASHTO: Is the American Association of State Highway and Transportation Officials, which is a nonprofit, nonpartisan association representing highway and transportation departments of all transportation modes.

Advanced Cyclist: A term used to describe a bicyclist that is comfortable, and in most cases, prefers on-road bicycling without bicycle lanes and paths. They travel further and tend to bicycle for exercise.

ADA: Refers to the American Disabilities Act of 1991 which gives civil rights protections to individuals with disabilities including equal opportunities in public accommodations, employment, transportation, state and local government services, and telecommunications.

Basic Cyclist: A term used to describe the basic bicyclist that is comprised of adults or teenagers who feel safe using neighborhood streets or off-road trails, such as greenways. They are casual or new and are less secure in their ability to ride in traffic without special accommodations. They typically prefer to ride on roads that have low traffic volumes and speeds and tend to ride for recreational purposes.

Bicycle: Every vehicle propelled solely by human power upon which any person may ride, having two tandem wheels, except scooters and similar devices. The term "bicycle" in this document also includes three and four-wheeled human-powered vehicles, but not tricycles for children.

Bicycle Activated Detector Loop: Are sensors installed in the roadway at intersections that trigger a change in a traffic signal. They allow cyclists to remain in the travel lane and avoid maneuvering to the side of the road to trigger a push button.

Bicycle Box: A box painted on a roadway at an intersection that allows bicyclists to move to the front of the line in traffic. Generally a bicycle lane allows cyclists to pass stopped motor vehicle traffic and enter the bicycle box. The bicycle box is located between the intersection and front of the motor vehicle stop line. Bicycle boxes increase awareness of cyclists in the roadway environment and provide the opportunity to cross intersections before motor vehicles.

Bicycle Facilities: A general term denoting improvements and provisions made by public agencies to accommodate or encourage bicycling. Examples include, but are not limited to bicycle parking/storage facilities, roadways with sharrow markings, bicycle lanes, paved shoulders, side paths, and greenways.

Bicycle Lane: A portion of a roadway that has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists.

Charlotte Area Transit System (CATS): Maintains a dual focus, managing day-to-day operations of Charlotte's transit services while planning for a regional transit system which will include bus rapid transit, light rail, commuter rail, and expanded bus service within a six-county area.

Children: This group is a subset of the Basic Cyclist and tends to share many of the same traits as the adult and teenager. They typically ride on neighborhood streets that have low traffic volume and speeds. This group includes children that are 12 or younger. Often times, the younger children ride on sidewalks to get oriented before they advance to the street.

Connectivity: The logical and physical interconnection of functionally related points so that people can move among them.

Crosswalk: A designated point on a road at which some means are employed to assist pedestrians who wish to cross a roadway or intersection. They are designed to keep pedestrians together where they can be seen by motorists, and where they can safely cross with the flow of vehicular traffic.

Curb Extension: A section of sidewalk at an intersection or mid-block crossing that reduces the crossing width for pedestrians and is intended to slow the speed of traffic and increase driver awareness

FHWA: Stands for the Federal Highway Administration who operates the Federal highway programs in partnership with the State and local agencies to meet the Nation's transportation needs.

Greenway/Trail: Is a linear path or open space, often composed of natural vegetation. Greenways can be used to create connected networks of open space that include traditional parks and natural areas specifically designed for pedestrian and bicycle use. Greenways provide an off-street component to the bicycle network.

Intersection: Is where two or more pathways or roadways join together

LRTP: Stands for the Long Range Transportation Plan that is managed by the Mecklenburg-Union Metropolitan Planning Organization (MUMPO) and is a federally mandated, long-term planning document detailing the transportation improvements and policies to be implemented in the MPO's planning area.

Median: Is considered to be a physical barrier that is constructed of concrete, asphalt, or landscaping, that separates two directions of traffic

Multi Use Path: Is a paved path (concrete or asphalt), typically 10- feet wide, physically separated from motorized vehicular traffic by an open space or landscaped barrier and located within the highway right-of-way. The Town of Indian Trail currently has some segments of a multi-use path along US 74 (Independence Boulevard).

MUMPO: Mecklenburg-Union Metropolitan Planning Organization

MUTCD: Is the Manual of Uniform Traffic Control Devices, which is the National standards guidebook on signage and pavement marking for roadways

NCDOT: North Carolina Department of Transportation

Neighborhood Connector: Is a short, off-road connection between two streets or areas that are currently not connected with formal infrastructure, such as concrete or asphalt.

Neighborhood Loop: Is a bicycle route that primarily utilizes neighborhood and residential streets to connect cyclists to destinations

On-street Bicycle Facility: Any bicycle facility that is constructed or marked on a roadway, such as a shared roadway, signed route, wide outside lane, bicycle lane, or paved shoulder

Pedestrian: Is a person that is traveling by foot or a person on roller skates, roller blades, child's tricycle, non-motorized wheelchair, skateboard, or other non-powered vehicles (excluding bicycles)

Quality of Life: Is a measure of the standard of living which considers non-financial factors such as health, functional status and social opportunities that are influenced by disease, injury, treatment or social and political policy

ROW (right of way): Is an easement held by the local jurisdiction over land owned by the adjacent property owners that allows the jurisdiction to exercise control over the surface and above and below the ground of the right-of-way; usually designated for passage

Safe Routes to School: Is a federal program that provides funding to encourage and facilitate the planning and implementation of bicycle and pedestrian projects near schools.

Sharrow: Is a painted roadway marking that alerts motorists that bicyclists are present and frequently use the roadway.

Shoulder: The portion of the roadway contiguous with the traveled way for the accommodation of stopped vehicles, for emergency use, and for lateral support of sub-base, base, and surface courses. Paved shoulders can be used for bicycle travel as well.

Shared Roadway: Is a roadway that is open to both bicycle and motor vehicle travel.

Sidewalk: Is typically a concrete facility that is located in the public right-of-way adjacent to a roadway. The facility can also be asphalt, brick or other materials.

Signed/Shared Roadway (Signed Bike Route): A shared roadway that has been designated with signage as a preferred route for bicycle use with either a "Share the Road" or "Bike Route" sign.

Thoroughfare: Is a road, at each end, connecting to another street.

Town-Wide Connectors: Are long bicycle connections that utilize major thoroughfares, railroad corridors or utility corridors (sewer easements and overhead transmission lines). These connections require significant coordination and planning.

Transportation Advisory Committee: Is a group of appointed citizens who work with the Town to provide recommendations to Town Council in an effort to make the Town of Indian Trail more bicycle and pedestrian friendly.

Bike It

Indian Trail Bicycle Master Plan