

Pilot Mountain Comprehensive Pedestrian Plan



March 2013



Division of
Bicycle &
Pedestrian
Transportation



STEWART



Acknowledgements

The Pilot Mountain Comprehensive Pedestrian Plan represents a collaborative effort by Pilot Mountain Town Management, Town Commission, community leaders and residents, and NCDOT Division of Bicycle & Pedestrian Transportation. The Town of Pilot Mountain thanks all parties who contributed to the development of this plan. The local expertise, history and direction provided by community are invaluable and will continue to be an asset moving forward.

Steering Committee

The Pilot Mountain Steering Committee Members, NCDOT Staff, and Consultant played key roles in development of the Comprehensive Pedestrian Plan.

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1 Introduction

1.1 Vision & Goals

The Pilot Mountain Comprehensive Pedestrian Plan is ultimately a plan to guide the Town in their pedestrian vision for the community. The Pilot Mountain Pedestrian Plan Steering Committee was established to do just that, with members from various corners of Town business, recreation, education, and neighborhood communities.

The consultant met with the Steering Committee in July 2012 to join in articulating the Town's vision and goals for pedestrians. The Steering Committee laid out a multi-faceted **Vision** for Pilot Mountain:

- Encourage Economic Development
- Get More People Walking
- Open Up Downtown
- Enhance Park & Ride Opportunities
- Create Sidewalk Connections for "Downtown Loop"
- Create Sidewalk Connections for Important Destinations

The Steering Committee also identified three high-priority **Goals** for the Town:

1. Create Town Connections for Walking
2. Connect to Pilot Mountain State Park
3. Establish Greenways & Recreational Trails

Each recommendation put forth in this plan is designed to establish a pedestrian network shaped by the vision of the Town.





1.2 Scope & Purpose of Plan

In 2004, The North Carolina Department of Transportation – Division of Bicycle & Pedestrian Transportation (DBPT) established an annual matching grant program – the Bicycle and Pedestrian Planning Grant Initiative – to encourage municipalities to develop comprehensive bicycle plans and pedestrian plans.

The Division recently expanded the planning grant program in order to assist smaller communities who may be better served by a comprehensive plan of smaller scale than those traditionally funded through the planning grant initiative program. For the 2011 grant cycle, Pilot Mountain was one of three towns selected for this type of plan.

Pilot Mountain recognized that they are a community with a latent demand for recreational and other walking opportunities. In 2011 the Town set out to develop a Town-wide pedestrian plan as a guide for creating a safe and effective pedestrian network which will encourage and facilitate pedestrian activity and travel in and around Pilot Mountain.

The Pedestrian Plan study area encompasses the Pilot Mountain municipal limits and unincorporated areas in Surry County extending southward to Pilot Mountain State Park, as well as northward to areas immediately surrounding Pilot Mountain Middle School. The Town understands that the success of their pedestrian network will depend on making meaningful connections to all of the destinations and amenities the area has to offer.

The comprehensive planning process for the Pedestrian Plan is rooted in the following general study phases:

Clearly define the Town's vision and goals

Representatives from the Pilot Mountain community were led through a visioning process in order to articulate the Town's desired direction for the Pedestrian Plan.

Evaluation of the current facilities, opportunities, and walking conditions

Existing pedestrian facilities, as well as opportunities and constraints were evaluated in the context of a Town-wide pedestrian network.

Development of project recommendations and guidance for implementation

Specific recommendations were developed for projects designed to enhance and expand the pedestrian network in a safe and effective manner

Prioritization of recommended projects

Projects were evaluated under several criteria to determine the best phasing for implementation of the pedestrian network.

Program Development

Program for implementing project recommendations identified in the plan were developed. The program is centered on relevant policies, responsible staff and agencies, and desirable timeframes.



Recommendations for enhancing and adding to local policy

As another tool in the pedestrian planning “toolbox”, existing policies were evaluated and policy recommendations were made to support implementation of the pedestrian network.

1.3 How Will a Pedestrian Plan Benefit Pilot Mountain?

The ultimate goal of the pedestrian plan is to implement a safe pedestrian network and encourage pedestrian travel and activity. The benefits of increased pedestrian activity in a community are numerous, and a safe pedestrian environment will have several positive impacts on Pilot Mountain.

Health Impacts

It is important to recognize that physical inactivity carries a significant health burden for communities. Research indicates that inactivity is closely linked to heart disease, diabetes, vascular disease, and some forms of cancer, and played a role in 58% of nationwide deaths in 2005 (*Physical Activity & Health, 2nd Edition*. Bouchard, Blair, Haskell; 2012). With increases in chronic diseases and health concerns related to inactivity, fostering opportunities for physical activity has become a focus for many communities.

The Centers for Disease Control estimated in 2009 that 26.7% of Surry County residents were physically inactive. Between 2004 and 2009, the percentage of adults with diagnosed diabetes in Surry County steadily increased from 8.6% to 11.2%. This is compared to an increase from 8.3% to 9.2% for North Carolina as a whole during the same time frame.

(Centers for Disease Control and Prevention: National Diabetes Surveillance System. Available online at: <http://apps.nccd.cdc.gov/DDTSTRS/default.aspx>.)

Sidewalks, greenways, and the accompanying treatments and amenities provide opportunities for physical activity. Whether patrons are interested in active transportation or purely recreational activity, pedestrian facilities provide multiple outlets for vigorous or passive exercise.

Economic Impacts

The most identifiable economic benefits of increased pedestrian activity are often bundled under the umbrella of tourism, but additionally include benefits to health care costs and neighboring property values.

Tourism

Investments in pedestrian networks typically bring human scale activity to neighborhoods and local commercial hubs, as well as regional recreational activity. Benefits associated with this increased activity include: increased local spending in pedestrian accessible areas; increased dollars brought in by visitors from outside of the community; and growth of tourism- and recreation-





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related industries such as outfitters and tour operators. Creating a walk-able community with increased pedestrian activity also establishes an atmosphere that attracts new residents, businesses, and industries.

Property Values

As recreational and pedestrian transportation resources, sidewalks and trails are often a very attractive amenity to potential residents and businesses. In particular, local and regional greenways increase demand for housing in proximity (typically within ¼ mile) to the trail. This increased demand for housing and greenway access increases property values, and in turn increases local tax revenues from those properties.



An economic impact analysis of the proposed *Ecusta Rail Trail*, spanning Henderson and Transylvania Counties in NC, projected a one-time 4% increase in property values. The analysis also projected an annual \$160,000 in local property tax revenues for properties located within a ¼ mile of the trail.

(<http://www.cityofhendersonville.org/Modules/ShowDocument.aspx?documentid=5011>).

Health Care Costs

Health care costs are directly affected by the health burden of physical inactivity within a community (See *Health Impacts* above). National studies consistently indicate a strong link between physical activity and reduced chronic illness, reduced health care costs, and increased worker productivity.

A 2006 study in the *Journal of Physical Activity and Health* examined the economic costs tied to physical inactivity in seven states including North Carolina (Chenoweth, Leutzinger. *Journal of Physical Activity and Health*. 2006, 3,148-163). The study concluded that physical inactivity was responsible for \$3 billion in direct medical care costs (2003 dollars) in those states. Productivity loss costs linked to physical inactivity in six of the states (including NC) were approximately \$54 billion. By contrast, productivity loss in three states (North Carolina, California, and Massachusetts) tied to excess weight accounted for \$31 billion.

Environmental Impacts

The environmental benefits of increased pedestrian activity and travel are typically realized in the form of reduced motor vehicle emissions. Pedestrians will generally walk between ¼ mile and ½ mile for basic trips. Encouraging pedestrian travel (as opposed to only recreational pedestrian activity) in communities can eliminate a significant number of motor vehicle trips, and the associated stops and starts which are the major culprits in harmful emissions. In Pilot Mountain, a smaller community with concentrated commercial and employment hubs, this is particularly true.



Establishing pedestrian connections to Pilot Mountain's homes, schools, downtown destinations, and PART transit connections can decrease vehicle miles traveled and the associated traffic congestion. This will lead to decreased fossil fuel use and CO (carbon monoxide), CO₂ (carbon dioxide), NO_x (nitrogen oxides) and VOC (volatile organic compounds) emissions.

Cultural Impacts

Greenways and pedestrian spaces provide excellent opportunities for social interaction and development. In many communities they are also the most readily available gathering place for residents. The natural areas found along greenways, in particular, provide for the types of social interactions that add to the cultural experience of a community.

In the same way that greenways are meeting places for people, on a regional scale they are also meeting places for municipalities and governments. Major greenway corridors are often located along rivers and streams, and link neighborhoods, towns, counties, and even states. Establishing and maintaining greenways and regional pedestrian networks often requires a level of inter-governmental cooperation and partnership that fosters strong working relationships.

Transportation Impacts

Pedestrian travel is one of the most inclusive forms of transportation available. Unlike transportation by private automobiles, pedestrian travel is available to commuters of all ages, skill levels, and disability types. Well-connected pedestrian networks also eliminate many of the financial barriers commonly associated with other forms of transportation such as fuel costs, insurance costs, vehicle maintenance, fares, or user fees.

As a form of recreational travel, walking and running are also significantly safer than driving or even commuter cycling on roads designed primarily for automobile traffic.



Household income is another factor which can impact transportation mode choice. For most households, transportation is the second largest household expense, after housing. Transportation costs typically include vehicle purchase, maintenance, insurance, and fuel, and can account for up to 25% of household income.

Median household income for Pilot Mountain residents in 2011 was estimated at \$35,078, compared to a median income of \$46,291 for all North Carolina residents. Table 2.3 below displays a comparison of Pilot Mountain and North Carolina estimated household incomes.

Table 2.3 Household Income (2007–2011 5-Year Estimates)

Income & Benefits	Pilot Mountain 692 Households	North Carolina 3,664,119 Households
Less than \$10,000	7.8%	8.2%
\$10,000 to \$14,999	12.4%	6.3%
\$15,000 to \$24,999	12.9%	12.0%
\$25,000 to \$34,999	16.8%	11.8%
\$35,000 to \$49,999	15.6%	15.0%
\$50,000 to \$74,999	12.0%	18.4%
\$75,000 to \$99,999	14.7%	11.4%
\$100,000 to \$149,999	5.5%	10.3%
\$150,000 to \$199,999	1.0%	3.4%
\$200,000 or more	1.3%	3.1%

Driving and non-recreational walking and bicycling behavior is greatly impacted by car ownership. Often, non-recreational walking trips grow more from necessity than desire. Households which have multiple vehicles (or in some case more vehicles than household members) tend to make fewer walking trips than households which do not.

Table 2.4 below compares rates of vehicle availability per household size for Pilot Mountain with North Carolina as a whole. In most instances vehicle ownership in Pilot Mountain is higher than that for the State. One glaring exception is for 1-person households, where 31.5% of these households in Pilot Mountain had no vehicle, compared to only 14.1% for the State. This indicates that a safe and effective pedestrian network could be very important for the largest number of households in Town.





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Table 2.4 Available Vehicles Based on Household Size (2007–2011 5-Year Estimates)

	1-Person Household		2-Person Household		3-Person Household		4-Person Household		Total	
	Pilot Mountain	North Carolina	Pilot Mountain	North Carolina						
Households	260	1,012,403	218	1,284,590	74	611,281	140	755,845	692	3,664,119
No Vehicle	31.5%	14.1%	1.4%	3.8%	0.0%	4.0%	0.0%	3.0%	12.3%	6.5%
1 Vehicle	53.1%	66.2%	24.3%	20.9%	33.8%	20.6%	9.3%	14.8%	33.1%	32.1%
2 Vehicles	10.4%	15.8%	58.7%	53.0%	50.0%	39.8%	62.9%	44.3%	40.5%	38.7%
3 Vehicles	5.0%	2.9%	12.8%	16.9%	16.2%	25.7%	17.9%	23.5%	11.3%	15.9%
4+ Vehicles	0.0%	1.0%	2.8%	5.3%	0.0%	9.8%	10.0%	14.4%	2.9%	6.8%

Census estimates also indicate that work commute modes chosen by Pilot Mountain residents were different from statewide trends in multiple ways (See Table 2.5). A significantly higher percentage of Pilot Mountain workers drove alone to work as compared to North Carolina worker: 88.1% in Pilot Mountain versus 80.7% in NC. Interestingly, a higher percentage of Pilot Mountain residents also walked to work: 2.8% in Pilot Mountain versus 1.8% in NC. This could indicate a relatively significant desire for walk-to-work opportunities among Pilot Mountain residents. The difference in the number of workers who chose to drive alone (when compared to statewide estimates) is accounted for primarily by reductions in workers who carpooled, worked from home, and used public or other transportation.

Table 2.5 Work Commute Modes (2007–2011 5-Year Estimates)

Transportation Mode	Pilot Mountain 705 Workers	North Carolina 4,221,511 Workers
Drove Alone	88.1%	80.7%
Carpooled	7.1%	11.0%
Public Transportation	0.4%	1.1%
Walked	2.8%	1.8%
Other Transportation	0.0%	1.3%
Worked from Home	1.6%	4.2%

2.2 Pedestrian Crash Data

Safety is an essential component of a community's pedestrian network. Safe pedestrian corridors encourage residents to walk, both as a form of travel to specific destinations, and for recreation. Safe facilities also ensure the health and well-being of walkers who cannot afford the costs associated with owning and operating a motor vehicle as their primary mode of travel.



Pilot Mountain Comprehensive Pedestrian Plan

As is the case in the majority of the nation's communities, a significant portion of Pilot Mountain's pedestrian network is linked to the road network in the form of sidewalks. This close linkage creates inherent conflicts between walkers, bicyclers, and drivers.



Historical data from reported crashes involving pedestrians and drivers indicates that, where the pedestrian network is accessible, walking is relatively safe in Pilot Mountain. Between 2000 and 2012, four total injuries were reported in Pilot Mountain as a result of vehicle-pedestrian crashes (See Table 2.6 below and *Pedestrian – Vehicle Accidents* map on Pg 10). This is in comparison to 189 injuries and deaths (17) for all of Surry County between 2000 and 2010. It should be noted that, universally, a large percentage of pedestrian injuries are believed to go unreported.

Table 2.6 Pilot Mountain – Reported Pedestrian Crash Locations

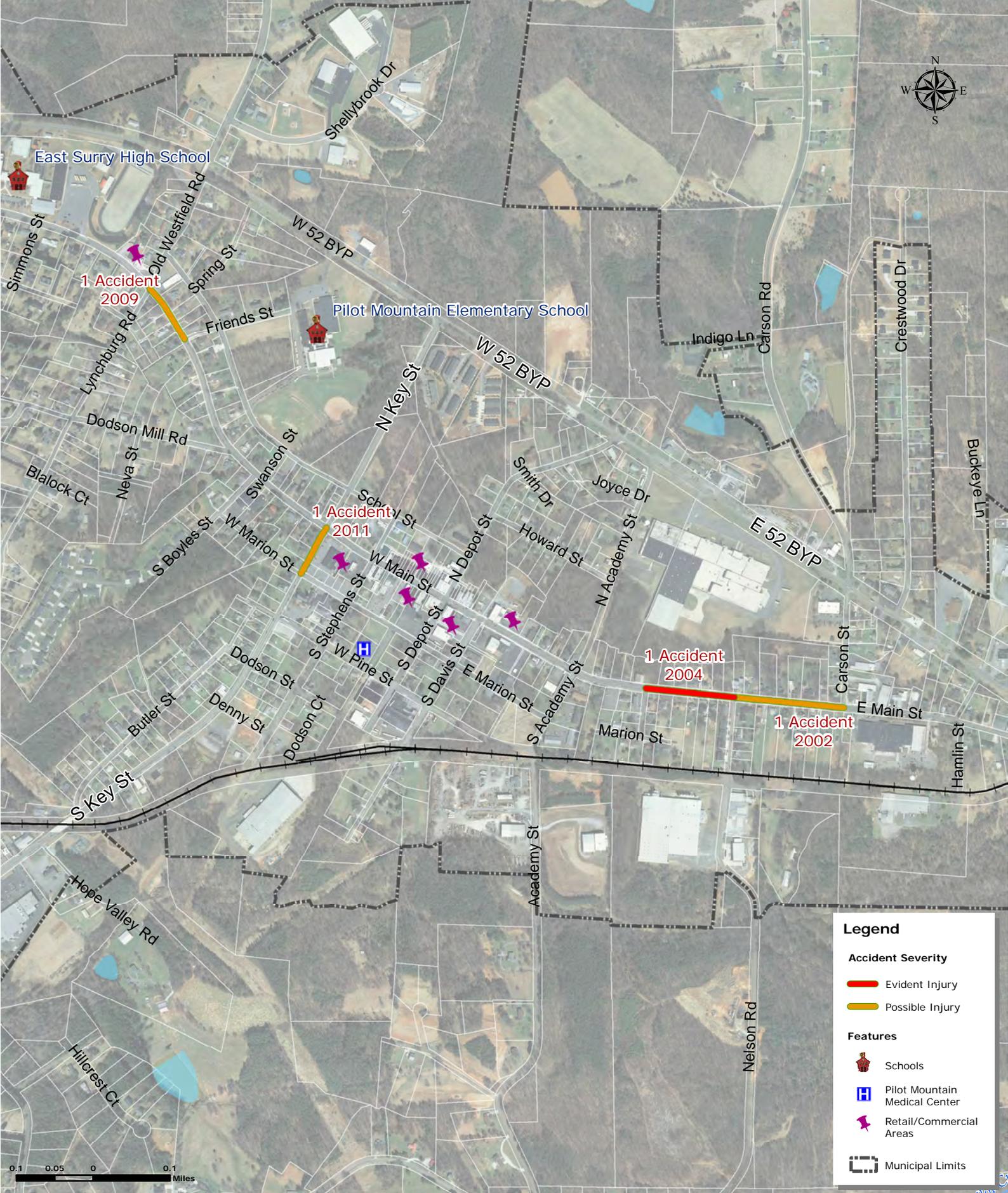
Pedestrian Injury	Accident Year	Road Facility	Road Segment	2000-2011 Accidents On Associated Road Segment
Possible Injury	2002	E Main St	Nelson St - Carson St	1
Evident Injury	2004	Main St	Nelson St - Needham St	1
Possible Injury	2009	W Main St	Friends St - Old Westfield Rd	1
Possible Injury	2011	Key St	Marion St - Main St	1

Source: NCDOT Traffic Safety Unit.

Table 2.7 Surry County – Reported Pedestrian Crashes

Pedestrian Injury	Crash Year											Total 2000-2010
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Killed	2	1	2	1	1	3	1	1	1	0	1	19
Disabling Injury	3	1	1	2	0	0	2	0	4	1	1	21
Evident Injury	2	2	2	2	5	5	7	6	5	6	7	63
Possible Injury	7	4	5	5	6	5	8	10	6	3	7	75
No Injury	1	0	0	0	0	1	0	0	0	1	1	4
Unknown Injury	0	0	1	0	2	1	0	0	1	0	2	7
Total	15	8	11	10	14	15	18	17	17	11	19	189

Source: NCDOT Pedestrian and Bicycle Crash Data Tool.



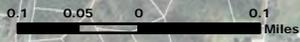
Legend

Accident Severity

- Evident Injury
- Possible Injury

Features

- Schools
- Pilot Mountain Medical Center
- Retail/Commercial Areas
- Municipal Limits



Town of Pilot Mountain Pedestrian Plan Pedestrian-Vehicle Accidents



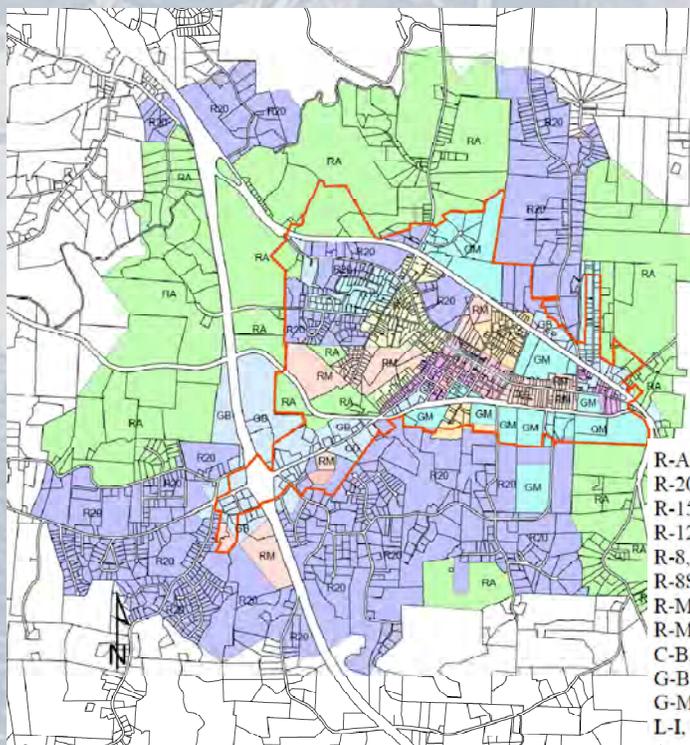
2.3 Current Land Use & Walking Environment

Land Use

In any community, there is interdependency between land use and transportation. This is particularly true for bicycle and pedestrian transportation, as these modes of transportation are more limited in their range of travel. Land uses in Pilot Mountain will have a significant impact on the development of the pedestrian network.

Pilot Mountain is primarily a suburban residential community. The Dodson Mill Rd and Lynchburg Rd corridors are almost exclusively residential. More dense residential areas are located closer to downtown and *rural-agricultural* (as identified by Pilot Mountain Zoning Code) residential areas are found at the fringes of the Town limits.

Commercial, or *general business*, uses are located at various points along each of the major corridors in town including S Key St, Main St, and Hwy 52 Bypass. Industrial, or *general manufacturing*, uses are more common along the eastern ends of Hwy 52 Bypass and Main St, and along the Yadkin Valley Railroad Corridor which runs east-west through town.



- R-A, Rural-Agricultural Residential
- R-20, Residential
- R-15, Residential
- R-12, Residential
- R-8, Residential
- R-SS, Residential
- R-M, Residential
- R-MH, Residential
- C-B, Central Business
- G-B, General Business
- G-M, General Manufacturing
- L-I, Light Industrial

Excerpt from *Town of Pilot Mountain Zoning Map*



The Walking Environment

The Project Steering Committee shared a great deal of information regarding the current walking environment in and around Pilot Mountain. Their observations and experiences include:

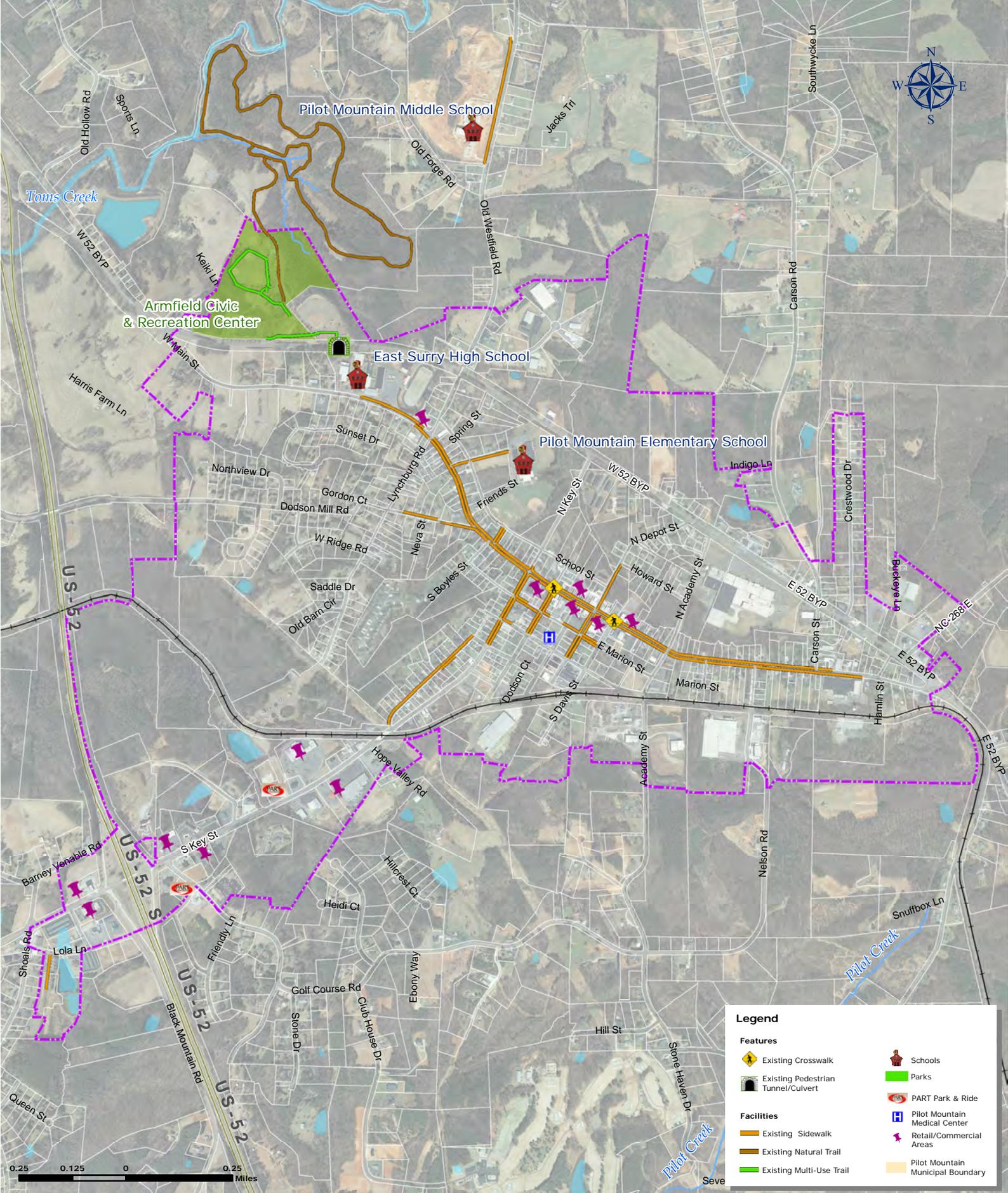
- There is a lot of (mostly) recreational walking on Main St. The Committee observed that there is rarely a time of day when there are not recreational walkers somewhere along the corridor.
- Pilot Mountain Elementary school children are allowed to walk to adjacent neighborhoods; however, Pilot Mountain Middle school children are not allowed to walk home due to a lack of pedestrian facilities to and from the school. An exception is made for a small number of middle school students who live in an adjacent neighborhood.
- There are factors which limit the ability to walk. These include: Lack of sidewalks to Pilot Mountain Middle School; and bridges which are “unfriendly” for walking.
- Sidewalk maintenance is an issue. Several sidewalk segments and blocks need repair.
- There is currently some bicycling on Main St and Key St.
- Armfield Center/Nelson Acres – with a 150-acre park, hiking trails, and seven campsites – should be a major destination; however, many people do not know about the trails. This may be due, in large part, to the lack of pedestrian connections in the area.



2.4 Existing Facilities

The first step in creating an effective pedestrian network is to take inventory of what pedestrian facilities are currently available. This is the foundation for understanding what opportunities can be capitalized upon and what challenges must be addressed.

See *Current Pedestrian Facilities* Map for existing pedestrian facilities and destinations.



Town of Pilot Mountain Pedestrian Plan Current Pedestrian Facilities



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2.5 Major Opportunities & Constraints

Despite being firmly situated in rolling hill terrain, Pilot Mountain offers several different walking environments. Among these environments are a focused, walkable downtown at the center of town, a suburban neighborhood environment to the west, and more rural areas to the north and south. With these various environments, come opportunities for extending the pedestrian network, as well as constraints which challenge pedestrian travel and recreation.

Opportunities

Main Street

Pilot Mountain, like many geographically smaller towns, has a true “Main Street” which runs primarily east-west and extends from one end of town to the other. Unlike many other towns, Pilot Mountain’s Main Street has sidewalk on one or both sides of the street for the majority of the street’s length. This presents an excellent opportunity to make relatively small investments in sidewalk and infrastructure, which will result in a more complete pedestrian network.



A safe and fully accessible Main Street will provide the Town’s residents with pedestrian access from large residential properties at the western end of town to schools located immediately on or within one block of Main St, to shops and services located in the heart of downtown. Existing Main Street will also serve as the foundation for the desired “Downtown Loop” which, when complete, will be an excellent contributor to economic development and activity in the downtown area.

Armfield Civic Center & Nelson Acres

In Armfield Center and Nelson Acres, Pilot Mountain has a relatively large athletics, hiking, and mountain biking amenity, the size of which is usually reserved for larger communities. The park property and hiking area are also located very close to downtown and residential areas.

Armfield Center is adjacent to East Surry High School’s athletic fields, and Nelson Acres is separated from Pilot Mountain Middle School by only a few small private properties. Completing pedestrian connections between these significant land uses/destinations will be key to the effectiveness of a planned pedestrian network.





52 Bypass Tunnel

While 52 Bypass does present a challenge to extending the pedestrian network in the area, Pilot Mountain does have a very unique opportunity which communities with similar roadway bisectors would be envious of: a pedestrian tunnel.

The pedestrian tunnel under 52 Bypass is located within the NCDOT right-of-way on the northern edge of East Surry High School. The tunnel serves to connect the high school with its athletic fields located on the north side of the bypass and adjacent to Armfield Center. This rare grade-separated crossing will be an asset to a well-planned pedestrian network.



Piedmont Area Regional Transportation (PART)

Transit is very important in providing mobility and access to residents of a community. Pilot Mountain benefits from inclusion in the PART system, which offers service via the Surry County Express Route. Park & ride locations are located on S Key St and Golf Course Rd.

Many residents choose not to drive, are physically unable to drive, or choose not to budget money for private transportation. PART express service allows these residents and others to reach important destinations in both Mount Airy and Winston Salem, effectively expanding the number and range of destinations for Pilot Mountain residents.





Constraints

52 Bypass

Due to roadway- and vehicle-dominated development of past years, many communities find that neighborhoods or entire sections of town are cut off by impassable roads or highways. Pilot Mountain's 52 Bypass does constitute one such barrier between Pilot Mountain 'proper' and properties to the north.



Despite relatively low posted speeds on the Bypass, there is a significant volume of traffic and few opportunities to cross the road. Similarly, a lack of sidewalk and pedestrian facilities along the corridor has discouraged pedestrian friendly land uses on adjacent properties.

School's athletic fields, 52 Bypass often becomes a default parking facility during football games and major sporting events. This parking conflict could present an additional barrier to pedestrian travel at certain times.

Community members have also noted that due to its location adjacent to East Surry High

Armfield Center Gate

Community members have indicated that the gate separating East Surry High athletic fields and Armfield Center often presents a barrier to pedestrian connectivity. The gate, which is open or closed at unpredictable times, creates uncertainty among students and other pedestrians regarding accessibility of the existing high school – Armfield Center connection. This encourages would-be users to take the hazardous path to Armfield Center alongside 52 Bypass.





South Key Street

South Key St is a major component of Pilot Mountain's roadway network and is a significant retail and commercial corridor in Town. Similarly to 52 Bypass, however, it is a high-vehicle volume facility which bisects the Pilot Mountain community. S Key Street south of Dodson has no sidewalks, and marked pedestrian crossings are not present.

S Key Street stretches just over a mile from Main St in downtown to the Highway 52 interchange. It is home to grocery and convenience stores, restaurants, a Piedmont Authority for Regional Transportation (PART) park & ride station, and single- and multi-family housing. These destinations are, and will continue to be, sources of pedestrian traffic. Effectively expanding the Town's pedestrian network will require safe access along S Key Street, and safe, logical crossing locations.

A major challenge presented by this concentrated commercial area is the frequency of driveways, or "curb-cuts" along the corridor. Significant numbers of driveways pose a challenge to bicycle and pedestrian safety by increasing the potential for conflicts and accidents, and also by interrupting the flow of bicycle or pedestrian travel.



Another significant barrier along S Key Street is the existing bridge over the Yadkin Valley Railroad, immediately south of Butler Street. This bridge has narrow shoulders and no existing sidewalk. The structure is 180 feet in length, while the accompanying guardrail extends the non-walkable length to more than 330 feet.

Mitigating this barrier will be essential to connecting the heavily trafficked commercial portion of S Key Street to the more residential and downtown segments to the north.





Pilot Mountain Comprehensive Pedestrian Plan

US Highway 52 Interchange

Highway 52, like any access-controlled highway, presents a major obstacle to pedestrian connectivity. The highway runs far west of Pilot Mountain proper, but does cut off a section of the Town limits including S Key St/NC 268, Foothill Dr, and Lola Ln.



The 52 Interchange presents several challenges for pedestrians: The crossing street is S Key Street, which currently has no pedestrian accommodations. The crossing utilizes an overpass bridge which has no sidewalks, and currently has insufficient width for sidewalk installation. The ramp intersections have recently been re-designed as roundabout entrances and exits. This is an excellent treatment for vehicles, however presents design challenges for bicycles and pedestrians, particularly at a high-volume traffic location like a highway.





Utilities

The presence of some utilities can present a challenge to pedestrian facilities and networks. Much of Pilot Mountain's road network is lined with utility poles in locations which are ideal for sidewalks and walking paths. Installing adequate pedestrian facilities along these corridors will require either: designing sidewalk alignments around utility poles, which may require additional easement in some cases; or planning for utility relocation, should it be deemed appropriate and in the Town's best interests.



Yadkin Valley Railroad Corridor

Like many towns with a rich history, the Pilot Mountain community is bisected by an active railroad corridor. The Yadkin Valley Railroad runs generally east-west through town, separating downtown and areas to the northwest from much of the S Key Street corridor and neighborhoods to the south. Currently there are two at-grade crossings of the railroad, and only one with a traffic control stop arm (S Academy St). There are no crossings with pedestrian accommodations. Either an at-grade or grade separated crossing of the railroad will be necessary in order to extend the pedestrian network south of the rail corridor.





2.6 Hazards & Maintenance Issues

Sidewalk Obstructions

Many sidewalks in Pilot Mountain are peppered with various obstructions which pose a hazard to pedestrian travelers, and present a challenge for both project implementation and maintenance. These obstructions primarily include utility poles, fire hydrants, and mailboxes.

When combined with narrow widths on some existing sidewalks, these obstructions become more apparent. Objects located within the pedestrian travel path can both pose tripping hazards, and force wheeled and foot travelers to temporarily enter the vehicle lane.



Curb Over-Paving



As a result of roadway resurfacing projects, the respective grades (pavement “height”) of roads such as S Key St (pictured left) have gradually been raised over time. As a result the older sidewalk curb is either at or below the level of the roadway. This creates a hazard for drivers, pedestrians, and disabled and wheeled sidewalk users. It also impacts the intended hydrological drainage for both the roadway and sidewalk.

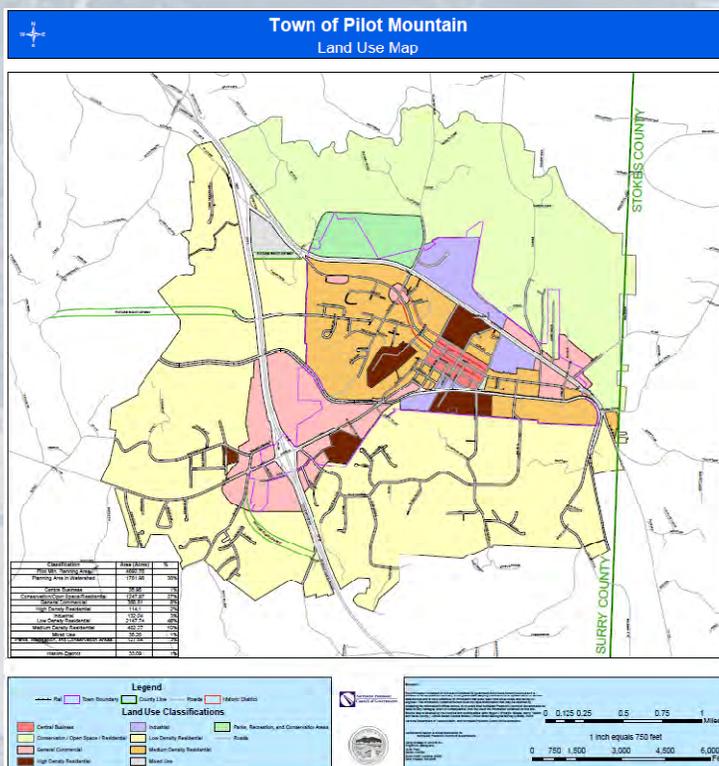


2.7 Relevant Plans, Policies, & Programs

Town, County, and Regional Plans

Town of Pilot Mountain Land Use Plan 2005-2015

The Town of Pilot Mountain Land Use Plan, completed in 2005, examined the then-current land use patterns and associated policies, and put forth recommendations aimed at enhancing land use with a horizon year of 2015. Several policy recommendations in the Land Use Plan addressed the overall transportation network, and pedestrian facilities, specifically.



Pilot Mountain Land Use Plan Map

Below are policies related to the pedestrian network:

1. Residential Development

Goal: Improve the quality of Pilot Mountain’s residential neighborhoods in order to promote the best interest of the residents and community as a whole.

Objectives

O-1.d Protect the small town atmosphere by encouraging pedestrian friendly neighborhoods.



Pilot Mountain Comprehensive Pedestrian Plan

Strategies:

- Develop a Sidewalk Plan to provide for maintenance of existing sidewalks and construction of new sidewalks.
- Explore adding provisions to the Subdivision Ordinance that would require sidewalks in new developments.
- Continue to reinvest in the infrastructure of the Town's older neighborhoods, including but not limited to sidewalks, street maintenance, water and sewer lines and drainage.
- Encourage residential development to be connected with recreation, parks, greenways and other recreation amenities.

4. Natural Resources and Recreation

Goal: Protect and enhance Pilot Mountain's Natural Resources and Recreation

Areas.

Objectives:

O-4.c Continue to recognize that Pilot Mountain's natural resources and scenic beauty are integral to the success of tourism and other economic development efforts.

O-4.d Maintain and expand Open Space areas throughout town.

Strategies:

- Develop a Parks and Recreation Plan that includes provisions for permanent open space greenways for recreational purposes and for parks, schools, and residential development that can be linked together by a trail system.

7. Transportation

Goal: Insure that roadways are efficient, convenient and safe.

Objectives:

O-7.d Encourage more bikeways and pedestrian ways as a means of providing additional recreation opportunities and alternatives to automotive travel.

O-7.e Work with NCDOT to develop a streetscape plan for the purpose of beautifying and ensuring the safety of Highway 268 (Key Street) between Hwy 52 and downtown.

Strategies:

- Work with NCDOT to plan for development of divided medians on major thoroughfares as a means to discourage strip development, increase traffic safety and promoting small town character.



- Amend the Zoning Ordinance to avoid future traffic problems and include access-planning provisions.

8. Community Appearance

Goal: Promote community appearance as a primary indicator of Pilot Mountain's unique small town character and rich quality of life.

Objectives:

O-8.d Continue to recognize that a focal point of Pilot Mountain's community image is found in the appearance of its downtown.

O-8.e Encourage attractive landscaping, signage, design and other visual improvements to new and existing development.

O-8.f Ensure that public areas, sidewalks, right-of-ways, etc. are attractive and well maintained.

Strategies:

- Revise the Zoning Ordinance to ensure that infill development, particularly in the downtown is in harmony with surrounding structures and the overall character of the particular area.

Surry County Comprehensive Transportation Plan (CTP)

The Surry County CTP was adopted in 2011 and puts forward recommendations for transportation facility additions and improvements throughout the County. The Surry County CTP makes the following recommendations for pedestrian facilities in or adjacent to Pilot Mountain:

Sidewalks- Recommended (Sidewalks needed on both sides of a facility)

- SURR0018-P Davis Street from Main Street (SR 1857) to Pine Street
- SURR0019-P Dodson Street from NC 268 (Key Street) to Butler Street
- SURR0020-P Depot Street from NC 268 to Howard Street
- SURR0021-P Old Westfield Road (SR 1809) from West Main Street (SR 1857) to South of Jacks Trail
- SURR0022-P Pine Street from Stephens Street to Davis Street
- SURR0023-P Lynchburg Road from West Main Street (SR 1857) to Dodson Mill Road (SR 2049)
- SURR0024-P South Key Street from Butler Street to East of Barney Venable Road (SR 2099)
- SURR0025-P West Main Street (SR 1857) from East Surry High School Driveway to 0.3 miles east of Harris Farm Lane

Sidewalks- Needs Improvement (Sidewalks needed on one side of a facility)

- SURR0026-P Butler Street from Dodson Street to NC 268 (Key Street)

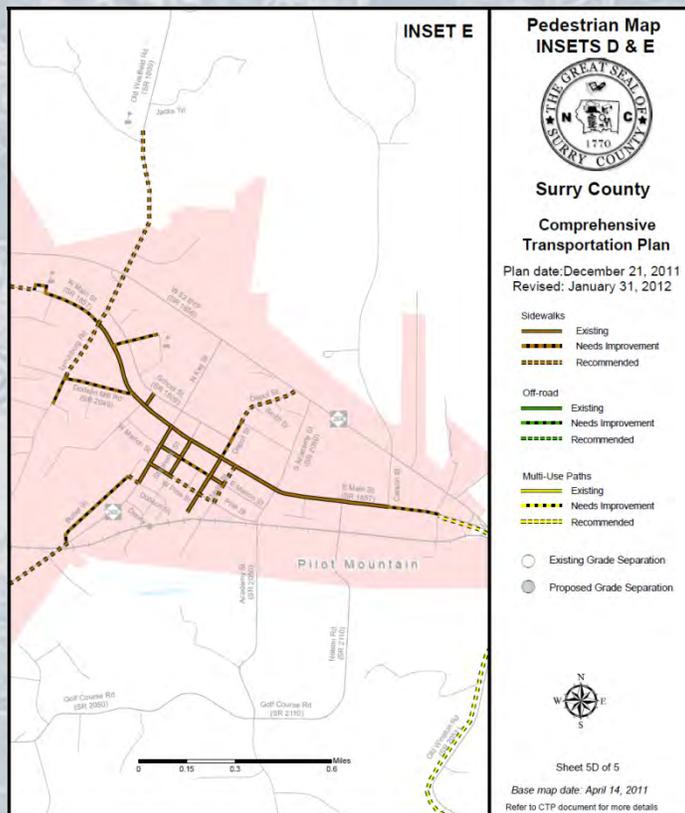


Pilot Mountain Comprehensive Pedestrian Plan

- SURR0027-P Depot Street from Howard Street to Main Street (SR 1857)
- SURR0028-P Dodson Mill Road (SR 2049) from Lynchburg Road to West Main Street (SR 1857)
- SURR0029-P Friends Street from Main Street (SR 1857) to 0.14 miles on Friends Street
- SURR0030-P East Main Street (SR 1857) from Carson Street (SR 1837) to Hamlin Street
- SURR0031-P West Main Street (SR 1857) from East Surry High School Driveway to 0.02 miles west of Old Westfield Road (SR 1809)
- SURR0032-P Marion Street from Stephens Street to Depot Street
- SURR0033-P Lynchburg Road from Dodson Mill Road (SR 2049) to Pine Street

Multi-use Paths/ Greenways Recommended for bicycles and pedestrians

- SURR0001-M From Lola Lane (South of NC 268) along Black Mountain Road (SR 2097) to Pilot Mountain State Park.

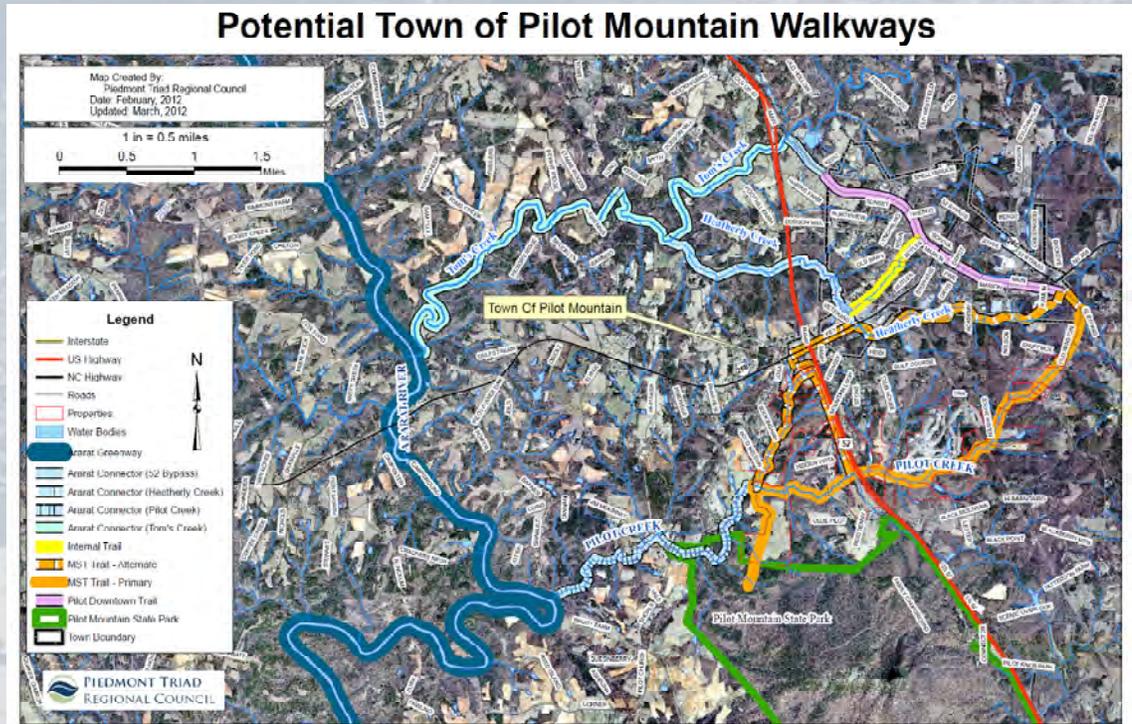


Excerpt from *Surry County CTP – Pedestrian Maps*



Potential Town of Pilot Mountain Walkways (Piedmont Regional Council, 2012)

In Spring of 2012, the Piedmont Triad Regional Council, in coordination with Surry County, outlined several potential regional trail and pedestrian greenway connections through the Pilot Mountain study area. This effort highlighted significant destinations and connection opportunities including the Ararat River, Pilot Mountain State Park, Pilot Creek, Tom's Creek, and the proposed Mountains-to-Sea Trail.



North Carolina Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2009-2013

The N.C. Division of Parks and Recreation prepares and maintains the state's Statewide Comprehensive Outdoor Recreation Plan. A SCORP is required in order for states to be eligible for federal Land and Water Conservation Fund (LWCF) acquisition and development assistance.

The following recommendations relating to pedestrian planning are taken from the SCORP Action Plan, which identifies specific actions the state will take during 2009-2013 to improve the state's outdoor recreational resources:

Public Health and Fitness

Goal: Foster public health and fitness through improved outdoor recreation resources and services.

Actions – Division of Parks and Recreation



Pilot Mountain Comprehensive Pedestrian Plan

- The DPR will provide technical assistance to agencies and organizations in the areas of trail corridor planning, design, construction, maintenance, management, and funding.
- The DPR will conduct educational workshops on trails.
- The DPR will use the Open Project Selection Process as a formal and objective method of selecting acquisition and development projects to be funded by LWCF.
- The Parks and Recreation Trust Fund (PARTF) will continue to make grants to state agencies and local governments to provide new capital improvements, repairs and renovation of areas and facilities.

Quality of Life and Economic Growth

Goal: Improve quality of life and economic growth through land and water conservation.

Actions – Department of Environment and Natural Resources

- The N.C. Department of Environment and Natural Resources will cooperate with seven states, several federal agencies, industry, environmental organizations, academia, and other interested parties in the Southern Appalachian Mountains Initiative. The SAMI will deal with regional issues of air quality and its effects on resources in the Southern Appalachians.
- The N.C. Wildlife Resources Commission will continue efforts to expand Commission managed acreage through cooperative efforts with Ducks Unlimited, the Natural Heritage Trust Fund, the Nature Conservancy, and other private and government agencies.
- Expand handicap accessibility to state park facilities. All new projects will provide accessibility in accordance with the standards of the American Disabilities Act. Pursue multiple funding opportunities for modifications to existing facilities.

Northwest Piedmont RPO 2007-2013 Transportation Improvement Program (TIP)

A Transportation Improvement Program is a fiscally constrained financial plan for transportation projects eligible for federal funding. This financial plan is typically developed and managed by Metropolitan Planning Organizations (MPO) or Regional Planning Organizations (RPO), and has a planning horizon of six years. Often, the majority of TIP projects are roadway projects, but many types of pedestrian projects qualify for inclusion in TIPs.

Projects included in the RPO TIP are prioritized within the RPO, and ultimately submitted to the State statewide prioritization by NCDOT. These County or MPO projects are then eligible for State-administered funding and construction. The 2014-2022 STIP is currently in draft form and includes no projects which directly impact the Pilot Mountain Study Area.



Pedestrian Ordinances & Policies

Town of Pilot Mountain Zoning Ordinance

The Town Zoning Ordinance articulates policies and legal requirements for zoning, land development, and other facets of Town growth. Two sections of the Zoning Ordinance specifically address pedestrian facilities:

152.40 (H) Walkway access to parks, schools, etc.

Where, along proposed streets, in the opinion of the Planning Board, a hazard to pedestrian safety exists, walkway easements shall be provided to assure convenient access to parks, playgrounds, schools and other places of public assembly. Walkway easements shall not be less than ten feet in width.



(C) Walkway and crosswalk easements.

A pedestrian crosswalk easement of at least ten feet in width shall be provided where such is deemed necessary and required by the Planning Board

153.050. D. Site Development Requirements

(6) A minimum of a five (5) foot wide sidewalk shall be required to be constructed parallel to the street right-of-way, preferably 5 to 10 feet from the back of the curb in a location approved by the Town. The sidewalk shall be constructed of concrete, a minimum of 4 inches in depth, 6 inches in depth where the sidewalk is crossed by a driveway. If an existing public street right-of-way is not available, the developer will be required to construct the sidewalk outside the street right-of-way on a permanent easement.

Surry County Zoning Ordinance

The Surry County Zoning Ordinance articulates policies which provide for the health, safety, and welfare of residents, encourage orderly development, protect the quality of the environment, and regulate the location and use of structures and land for commerce, industry and residency.

Because much of the Pilot Mountain Study Area is within County jurisdiction, it is important to examine pedestrian-related policies in the county Zoning Ordinance. The Zoning Ordinance makes several references to the development/construction of pedestrian facilities.

Section 9-G. Development Standards. (6. e.)

Access to Open Space. All property owners within the development shall have access to open space by means of a public street or improved walkway located in an easement at least 15 feet in width.



Pilot Mountain Comprehensive Pedestrian Plan

Section 9-G. Development Standards. (6. f.)

Open Space Connectivity Requirements. Where practicable, areas of open space within a PR-CD shall be connected. Separate areas of active open space on site shall be connected by a sidewalk or pedestrian path consisting of an all weather surface. Open space in PR-CDs shall adjoin open space in neighboring parcels where practicable. If public parks or greenways are present on adjacent sites, a pedestrian connection to these resources shall be made from the PR-CD.

Section 9-G. Development Standards. (4.)

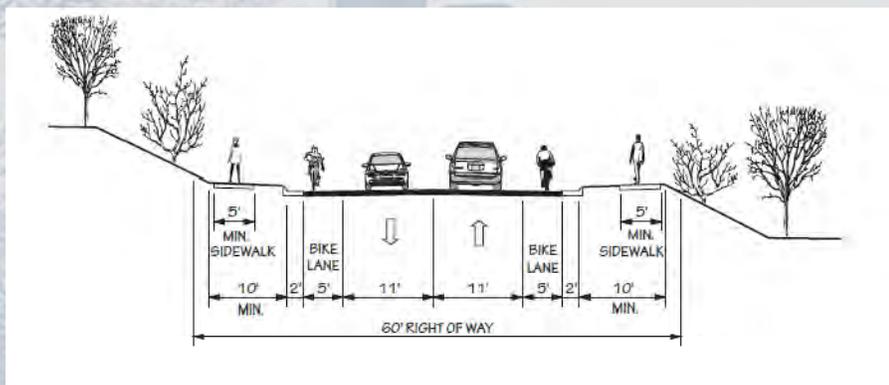
Pedestrian Access. Pedestrian and other modes of non-vehicular movement shall be provided in accordance with Surry County Subdivision Ordinance requirements.

Section 8.4 Buffer Area Requirements in Watershed Areas (B.)

No new development is allowed in the buffer except for water dependent structures, other structures such as flag poles, signs, and security lights which result in only diminutive increases in impervious area and public projects such as road crossings and greenways where no practical alternative exists. These activities should minimize built-upon surface area, direct runoff away from the surface waters and maximize the utilization of stormwater Best Management Practices.

NC Department of Transportation Complete Streets Policy

Complete Streets is a term used to identify the movement toward developing streets as transportation corridors which include facilities or provisions for several transportation modes. Complete streets policies can be effective at encouraging multiple, and alternative, transportation modes in a community.



*Excerpt from NCDOT Typical Highway Cross Sections;
Updated to reflect Complete Streets policy.*

In July of 2009, NCDOT adopted a Complete Streets policy which can be found here:

<http://www.completestreetsnc.org/> and
http://www.bytrain.org/fra/general/ncdot_streets_policy.pdf.



U.S. Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations

In March of 2010, USDOT adopted a policy to reflect the departments support for fully integrated active transportation networks. USDOT recognizes that walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. The intent of the policy is to affirm that well-connected walking and bicycling networks are an important component of livable communities, and that their design should be a part of federally funded projects.

The USDOT Policy Statement is as follows: The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

http://www.fhwa.dot.gov/environment/bikeped/policy_accom.htm



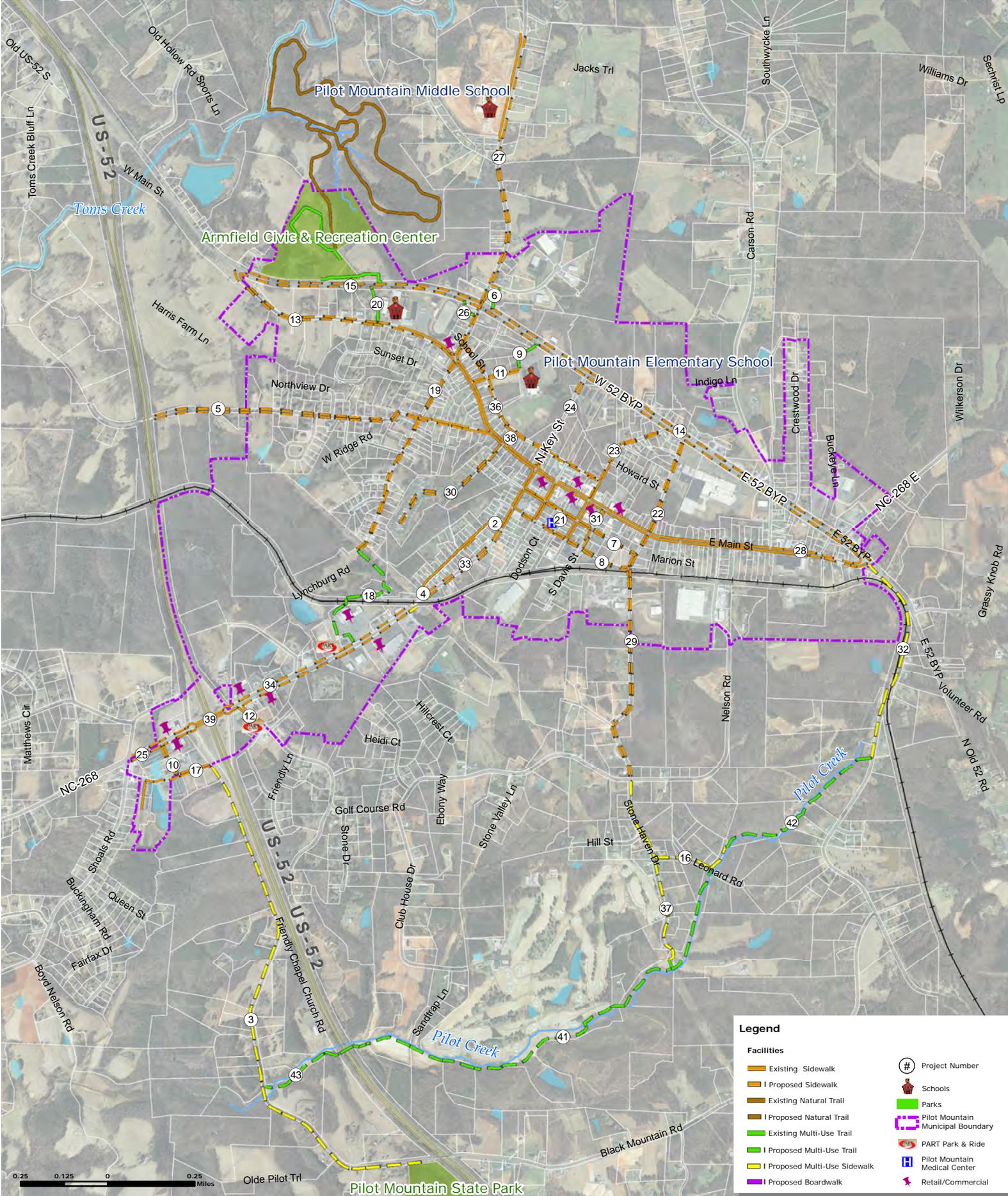
3. Project Recommendations

3.1 Project Recommendations

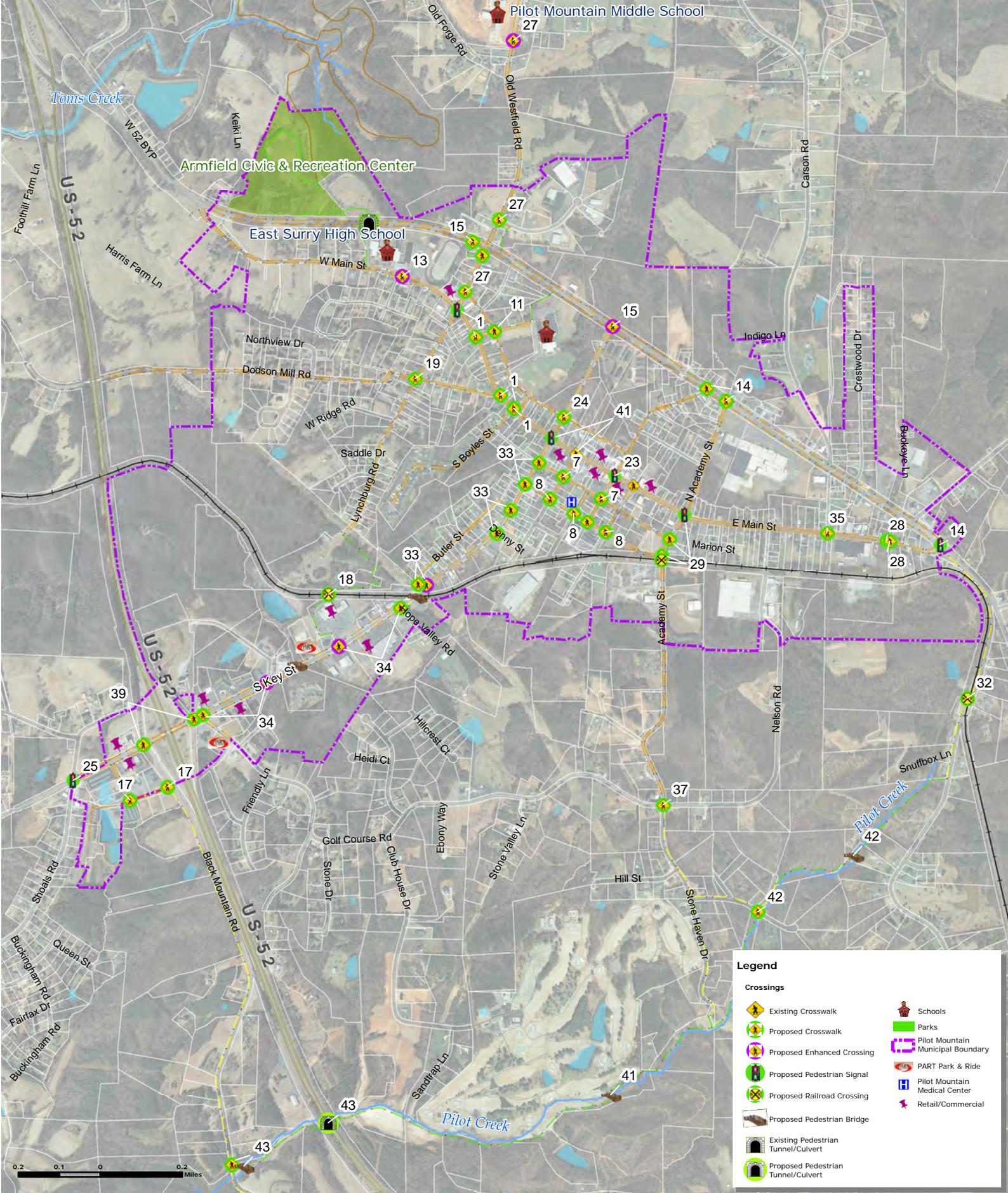
Careful consideration of the vision and goals outlined by the project Steering Committee, as well as analysis of the existing pedestrian network, destinations, land uses, and desired connections, has yielded specific recommendations for enhancing Pilot Mountain's pedestrian network. These recommendations take the form of **43 pedestrian projects**, including sidewalks, greenways, multi-use sidewalks (sidepaths), road crossings, and safety enhancements. These projects account for more than **34 miles** of existing and proposed pedestrian facilities which will form a safe, accessible, and effective pedestrian network in Pilot Mountain.

The recommended projects have also undergone a detailed analysis of their connectivity impact, their safety impact, and their fulfillment of the vision and goals of Pilot Mountain's community members and leaders. This analysis is discussed further in section *3.3 Project Prioritization*.





Town of Pilot Mountain Pedestrian Plan Pedestrian Project Recommendations



Town of Pilot Mountain Pedestrian Plan Crossing & Intersection Recommendations



Project #	Segment	Status	Length (Feet)	Pedestrian Facility	Proposed Intersection/Crossing Features	Project Limits
1	Main St Neighborhood Crosswalks	Proposed	N/A	N/A	S Boyles St: 1 Proposed Crosswalk Dodson Mill Rd: 1 Proposed Crosswalk Friends St: 3 Proposed Crosswalks	Old Westfield Rd – N Key St
2	Dodson St	Proposed	190	Sidewalk (One Side)		Key St - Butler St Ext
3	Black Mountain Rd	Proposed	8,241	Multi-Use Sidewalk		Lola Ln - Pilot Mountain State Park
4	Butler St	Proposed	36	Sidewalk (One Side)	1 Proposed Mid-Block Crossing	Butler St Ext - S Key St
5	Dodson Mill Rd	Proposed	9,426	Sidewalk (Both Sides)		W Main St – US Highway 52
6	Shellybrook - 52 Bypass Connector	Proposed	505	Multi-Use Trail		Shellybrook Dr – W 52 Bypass
7	East - West Marion St	Proposed	2,279	Sidewalk (Both Sides)	S Stephens St: 4 Proposed Crosswalks S Depot St: 4 Proposed Crosswalks	S Key St - S Academy St
8	East - West Pine St	Proposed	3,513	Sidewalk (Both Sides)	S Stephens St: 3 Proposed Crosswalks Medical St: 3 Proposed Crosswalks S Depot St: 4 Proposed Crosswalks S Davis St: 4 Proposed Crosswalks	S Key St - S Academy St
9	Elementary School Connector	Proposed	529	Multi-Use Trail		Friends St - W 52 Bypass
10	Foothill Dr	Proposed	1,046	Sidewalk (Both Sides)		NC 268 - Lola Ln
11	Friends St	Proposed	695	Sidewalk (One Side)	School St: 4 Proposed Crosswalks	W Main St - Elementary School Connector
12	Golf Course Rd	Proposed	884	Sidewalk (Both Sides)		S Key St - PART Station
13	Main St West	Proposed	6,256	Sidewalk (Both Sides)	Old Westfield Rd: 4 Proposed Crosswalks 8 Pedestrian Signal Heads 1 RRFB Mid-Block Enhanced Crossing	Old Westfield Rd – W 52 Bypass
14	Hwy 52 Bypass East	Proposed	9,827	Sidewalk (Both Sides)	N Depot St: 1 Proposed Crosswalk N Academy St: 3 Proposed Crosswalks E Main St: 6 Pedestrian Signal Heads	N Key St – Old Winston Rd
15	Hwy 52 Bypass West	Proposed	11,154	Sidewalk (Both Sides)	N Key St: 1 RRFB Enhanced Crossing 2 Proposed Crosswalks 52 Bypass Ramp: 1 Proposed Crosswalk	W Main St – N Key St

Proposed projects located along NCDOT-maintained roadways will require review and approval by NCDOT engineer(s). Green text indicates identified "Focus Project". See section 3.3 Focus Projects for detailed information.



Pilot Mountain Comprehensive Pedestrian Plan

Project #	Segment	Status	Length (Feet)	Pedestrian Facility	Proposed Intersection/Crossing Features	Project Limits
16	Leonard Rd	Proposed	900	Multi-Use Sidewalk		Stone Haven Dr – Pilot Creek Greenway Phase II
17	Lola Ln	Proposed	1,504	Sidewalk (Both Sides)	Foothill Dr: Black Mnth Rd: 2 Proposed Crosswalks 1 Proposed Crosswalk	Lola Ln - Black Mountain Rd
18	Lynchburg - Key Connector	Proposed	2,537	Multi-Use Trail	Yadkin Valley RR: 1 Proposed RR Crossing	Lynchburg Rd – S Key St
19	Lynchburg Rd	Proposed	6,290	Sidewalk (Both Sides)	Dodson Mill Rd: 4 Proposed Crosswalks	W Main St - Water Treatment Facility
20	Main Street - 52 Connector	Proposed	548	Multi-Use Trail		W Main St - W 52 Bypass
21	Medical St	Proposed	607	Sidewalk (Both Sides)		W Pine St - W Marion St
22	N Academy St	Proposed	2,954	Sidewalk (Both Sides)		W Main St - E 52 Bypass
23	N Depot St	Enhance Existing Proposed	625 2,679	Sidewalk Sidewalk (Both Sides)	W Main St: 8 Pedestrian Signal Heads	W Main St - E 52 Bypass
24	N Key St	Proposed	2,984	Sidewalk (Both Sides)	School St: 4 Proposed Crosswalks	W Main St - W 52 Bypass
25	NC 268	Proposed	1,845	Sidewalk (Both Sides)	Shoals Rd: 4 Pedestrian Signal Heads 2 Proposed Crosswalks	Shoals Rd – US Hwy 52 Ramp
26	Old Westfield - Bypass Ramp Connector	Proposed	367	Multi-Use Trail		W 52 Bypass – Old Westfield Rd
27	Old Westfield Rd	Proposed	8,592	Sidewalk (Both Sides)	School St: 52 Bypass Ramp: Shellybrook Dr: 1 RRFB Enhanced Mid-Block Crossing 1 Proposed Crosswalk 1 Proposed Crosswalk 1 Proposed Crosswalk	W Main St – Pilot Mountain Middle School
28	Main St Downtown	Proposed	2,151	Sidewalk (Both Sides)	Burlington Ln: Hamlin St: 1 Proposed Crosswalk 1 Proposed Crosswalk	Carson St – E 52 Bypass
29	S Academy St	Proposed	7,767	Sidewalk (Both Sides)	W Main St: E Marion St: E Pine St: Yadkin Valley RR: 3 Proposed Crosswalks 8 Pedestrian Signal Heads 3 Proposed Crosswalks 3 Proposed Crosswalks 1 Proposed RR Crossing	E Main St – Golf Course Rd
30	S Boyle St	Proposed	4,192	Sidewalk (Both Sides)		W Main St – S Boyles St Terminus

Proposed projects located along NCDOT-maintained roadways will require review and approval by NCDOT engineer(s).
 Green text indicates identified "Focus Project". See section 3.3 Focus Projects for detailed information.



Project #	Segment	Status	Length (Feet)	Pedestrian Facility	Proposed Intersection/Crossing Features	Project Limits
31	S Davis St	Proposed	1,246	Sidewalk (Both Sides)	Yadkin Valley RR: 1 Proposed RR Crossing	E Main St - E Pine St
32	Old Winston Rd	Proposed	3,287	Multi-Use Sidewalk	1 Proposed Pedestrian Bridge (Yadkin Valley RR)	E Main St - Pilot Creek Greenway
33	S Key St - Railroad North	Enhance Existing	1,583	Sidewalk	1 RRFB Mid-Block Enhanced Crossing Denny St: 1 Proposed Crosswalks Dodson St: 2 Proposed Crosswalks W Pine St: 2 Proposed Crosswalks W Marion St: 2 Proposed Crosswalks	W Main St - Yadkin Valley Railroad
34	S Key St - Railroad South	Proposed	148 5,834	Multi-Use Sidewalk (Both Sides)	1 Proposed Pedestrian Bridge (Heatherly Creek) 2 RRFB Mid-Block Enhanced Crossings Hope Valley Rd: 1 Proposed Crosswalk Golf Course Rd: 1 Proposed Crosswalk	Yadkin Valley Railroad - Golf Course Rd
35	Carson St Crosswalk	Proposed	N/A	N/A	Carson St: 2 Proposed Crosswalks	N Main St & Carson St Intersection
36	School St	Proposed	5,739	Sidewalk (Both Sides)		N Depot St - Old Westfield Rd
37	Stone Haven Dr	Proposed	2,893	Multi-Use Sidewalk	Golf Course Rd: 2 Proposed Crosswalks	Leonard Rd - Pilot Creek Greenway
38	Swanson St	Enhance Existing	207	Sidewalk (Both Sides)		W Main St - School St
39	US Highway 52 Interchange	Proposed	1,766	Sidewalk (Both Sides/Roundabout)	Ramps: 2 Proposed Crosswalks (Splitter Islands)	S Key St across US 52 Interchange
40	Main Street - Key Street Pedestrian Signal	Proposed	N/A	N/A	8 Pedestrian Signal Heads 4 Proposed Crosswalks	Main St & Key St Intersection
41	Pilot Creek Greenway - Phase I	Proposed	5,797	Multi-Use Trail	1 Proposed Pedestrian Bridge (Pilot Creek)	Stone Haven Dr - US Hwy 52
42	Pilot Creek Greenway - Phase II	Proposed	4,517 433	Multi-Use Trail Multi-Use Sidewalk	1 Proposed Pedestrian Bridge (Pilot Creek) Leonard Rd: 1 Proposed Crosswalk	Stone Haven Dr - Old Winston Rd
43	Pilot Creek Greenway - Phase III	Proposed	1,567	Multi-Use Trail	US Highway 52: 1 Pedestrian Culvert 1 Proposed Pedestrian Bridge (Pilot Creek) Black Mntn Rd: 1 Proposed Crosswalk	US Hwy 52 - Black Mountain Rd

Proposed projects located along NCDOT-maintained roadways will require review and approval by NCDOT engineer(s). Green text indicates identified "Focus Project". See section 3.3 Focus Projects for detailed information.



3.2 Maintenance & Hazard Mitigation Recommendations

Sidewalk Obstructions

As discussed in section 2.6 *Hazards & Maintenance Issues*, many of Pilot Mountain's sidewalks are peppered with obstructions such as utility poles and mailboxes, which pose a hazard to pedestrian travelers and present challenges for project implementation. A process for periodically identifying and addressing these hazards should be implemented by the Town. Pilot Mountain will benefit by drawing from a suite of recommendations designed to improve access along narrow and obstructed sidewalks.

Many of the following solutions for Pilot Mountain are included in FHWA's guidance on sidewalk access design:

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/contents.cfm

Solution 1:

Eliminate any removable or protruding obstacles, such as tree branches, overgrown shrubs, and moveable signs, which limit the clear width of the sidewalk and/or protrude into the path of travel. Objects that are removed should be secured in their new location to prevent them from being moved back into the pedestrian zone.

Solution 2:

Eliminate permanent obstacles and protruding objects that limit the clear width of the sidewalk. Whenever possible, permanent obstacles and protruding objects should be removed from the pedestrian zone. Locations where the passage width is less than 3 feet should be prioritized.

Solution 3:

Secure additional right-of-way or easement to re-route or "bulb" sidewalk around permanent obstacles (pictured below), or provide jogged landings where driveway crossings and curb ramps limit the existing clear width of sidewalk to less than 3 feet.



Utility Pole Bulb-Out
Photo courtesy of U.S. Access Board.
www.access-board.gov

Narrow sidewalks are typically constrained by narrow rights-of-way and additional sidewalk width will require additional right-of-way or easement. Narrow sidewalks also tend to have driveway crossings and curb ramps without level landings. Similarly to utility poles or fire hydrants, sudden changes in cross slope created by

these driveway crossings and curb ramps can pose an obstacle to walkers and those with impaired



mobility (see “*Driveway Crossings*” in Appendix).

Solution 4:

Reduce the street width in order to increase the sidewalk width. Occasionally, additional width for a sidewalk can be created by reducing the width of the motor vehicle lanes. This solution should not be completed without a careful analysis of potential traffic impacts and operation.

In many North Carolina communities, existing vehicle lanes of 12’ width can be reduced to the updated NCDOT standard of 11’, providing an additional 2-4’ of sidewalk clear width. Additionally, reducing lane widths in Pilot Mountain’s residential areas will have a traffic calming effect as motorists tend to travel slower on narrower streets. Locations identified as existing or potential bicycle corridors should be carefully evaluated before reducing lane widths due to the potential for negative impacts on bicycle safety.

NCDOT offers specific guidance on mitigating pedestrian hazards, and more specifically, avoiding “*creating hazards to pedestrian movements*”, as a component of highway and NCDOT-maintained roadway improvements. The NCDOT Pedestrian Policy Guidelines can be found here:

http://www.ncdot.gov/bikeped/download/bikeped_Ped_Policy.pdf

Curb Over-Paving



Also discussed in section 2.6 *Hazards & Maintenance Issues*, roadway resurfacing projects in specific locations have effectively lowered the adjacent sidewalk curb such that it is at or below the level of the roadway. This creates a hazard condition for drivers, pedestrians, and wheeled sidewalk users.

Maintenance should be undertaken on such sidewalk locations so that a clear barrier is re-established between vehicle and pedestrian facilities. In some instances this may require maintenance work to raise the effective level of the sidewalk. In other instances this may necessitate replacing the sidewalk or installing new sidewalk on top of the existing.

The *Recommended Sidewalk Repair Locations* map, below, identifies locations of existing sidewalk which should be considered for targeted maintenance or re-paving. Sidewalk repair projects addressing the “over-paving” condition should be coordinated with the NCDOT Division 11 engineer.



Town of Pilot Mountain Pedestrian Plan Recommended Sidewalk Repair Locations



3.3 Focus Projects

In order to provide immediate guidance for specific connectivity challenges identified early in the planning process by the Comprehensive Pedestrian Plan Steering Committee, ten “focus projects” have been selected for analysis. These sidewalk, greenway, and safety projects are unique in the connectivity opportunities they represent and challenges they may encounter, and have been evaluated to determine:

- The agency and/or partners most suited to guide implementation;
- Basic measurable associated with the individual projects;
- Impacts and physical challenges associated with design and eventual construction;
- The most likely funding sources for implementation; and
- Order of magnitude estimates of eventual construction costs

These priority projects are presented in *project action sheets*, described below, and relevant maps.

Project Action Sheets

Project Action Sheets have been developed in order to focus recommendations, impacts, acquisition strategies, cost estimates, and funding recommendations on respective projects. This format provides concise information for identifying and pursuing funding opportunities.



Responsible Entity identifies the agency or department which will likely be responsible for construction and/or maintenance of the facility.

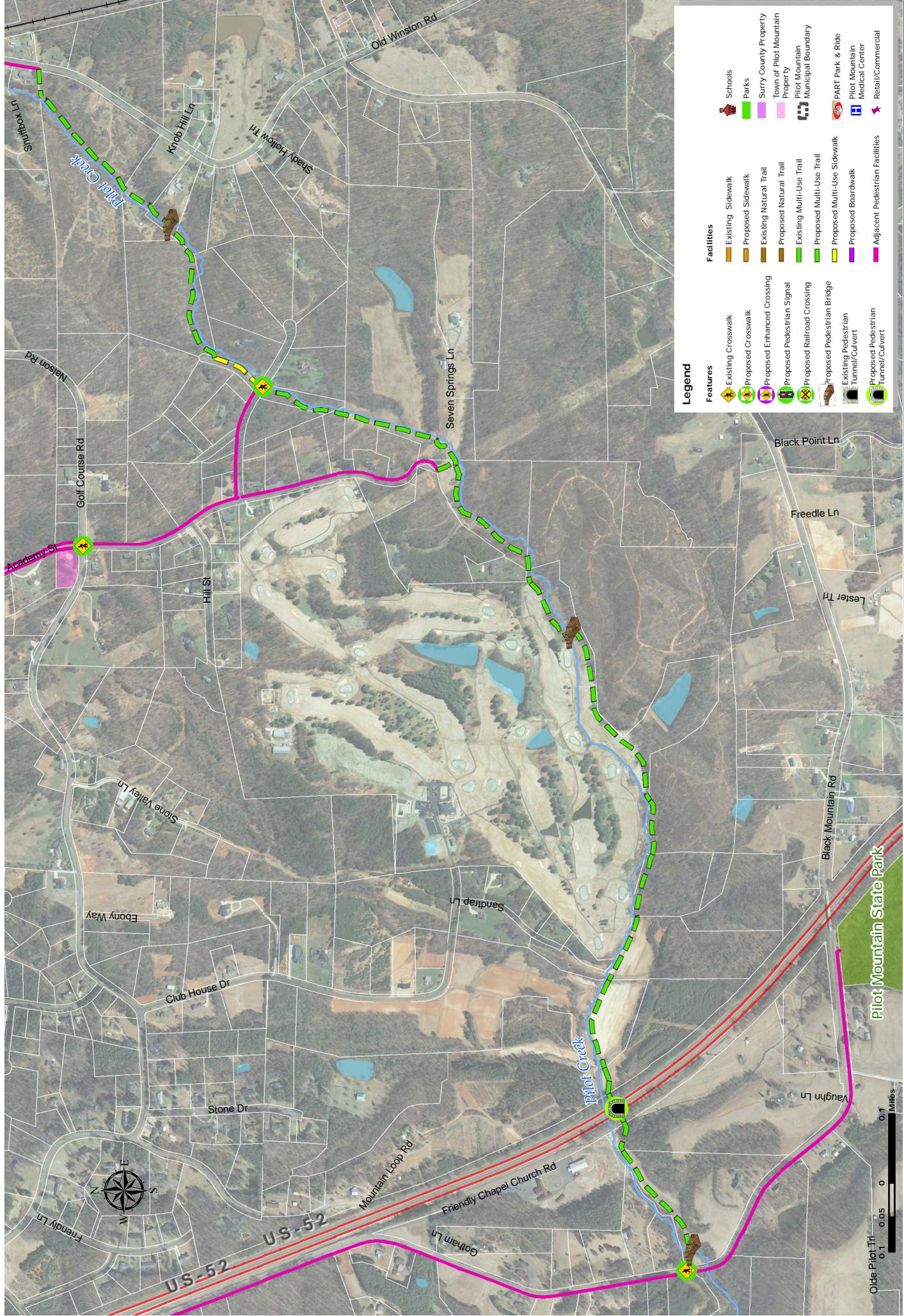
Funding Strategy identifies the recommended funding source(s) for proposed improvements along the segment.

Segment Facts identifies proposed lengths and quantities associated with the recommended project pedestrian facility and safety/crossing improvements.

Segment Status identifies the physical limits of the segment or project, and its significance in the overall pedestrian network. The current planning, design, or construction status of the segment is also addressed.

Implementation Challenges identifies major design or property challenges associated with the segment/ proposed project.

Segment Costs identifies estimated costs associated with the proposed project.



Legend	
Features	Facilities
Existing Crosswalk	Existing Sidewalk
Proposed Crosswalk	Proposed Sidewalk
Proposed Enhanced Crossing	Existing Natural Trail
Proposed Pedestrian Signal	Proposed Natural Trail
Proposed Railroad Crossing	Existing Multi-Use Trail
Existing Pedestrian Tunnel/Culvert	Proposed Multi-Use Trail
Proposed Pedestrian Tunnel/Culvert	Proposed Multi-Use Sidewalk
	Proposed Boardwalk
	Adjacent Pedestrian Facilities
	Schools
	Parks
	Surry County Property
	Town of Pilot Mountain Property
	Municipal Boundary
	PART Park & Ride
	Pilot Mountain Medical Center
	Retail/Commercial

Town of Pilot Mountain

Focus Project - Pilot Creek Greenway





PILOT CREEK GREENWAY PHASES I, II, III

PROJECTS #41, 42, 43



RESPONSIBLE ENTITY

Town of Pilot Mountain
Surry County

FUNDING STRATEGY

PARTF Grant
Recreational Trails Grant
Transportation Alternatives

SEGMENT FACTS

Facility Type:	Multi-Use Trail
	Multi-Use Sidewalk
Total Length:	2.33 Miles
Existing Facilities:	None
Stream Crossings:	3 (Pilot Creek)
Road Crossings:	Black Mountain Rd
	Leonard Rd
	US Highway 52

SEGMENT STATUS

The proposed *Pilot Creek Greenway* segment will be the primary link in connecting downtown Pilot Mountain to Pilot Mountain State Park. This greenway corridor has also been identified as the preferred route for the local *Mountains-to-Sea Trail* connection.

This proposed project consists of a multi-use trail and short multi-use sidewalk segment running parallel to Pilot Creek from Old Winston Rd at the eastern end of the study area southwest to Black Mountain Rd at the western edge of the study area.

Adoption of this plan will trigger consideration of the proposed greenway in future NCDOT plans as per the the NCDOT Greenway Policy found here: http://www.ncdot.gov/_templates/download/external.html?pdf=http%3A//www.ncdot.gov/bikeped/download/bikeped_laws_Greenway_Admin_Action.pdf

IMPLEMENTATION CHALLENGES

The proposed greenway will need to cross Pilot Creek at three locations.

The greenway will also need to cross under US Highway 52 utilizing a new pedestrian culvert.

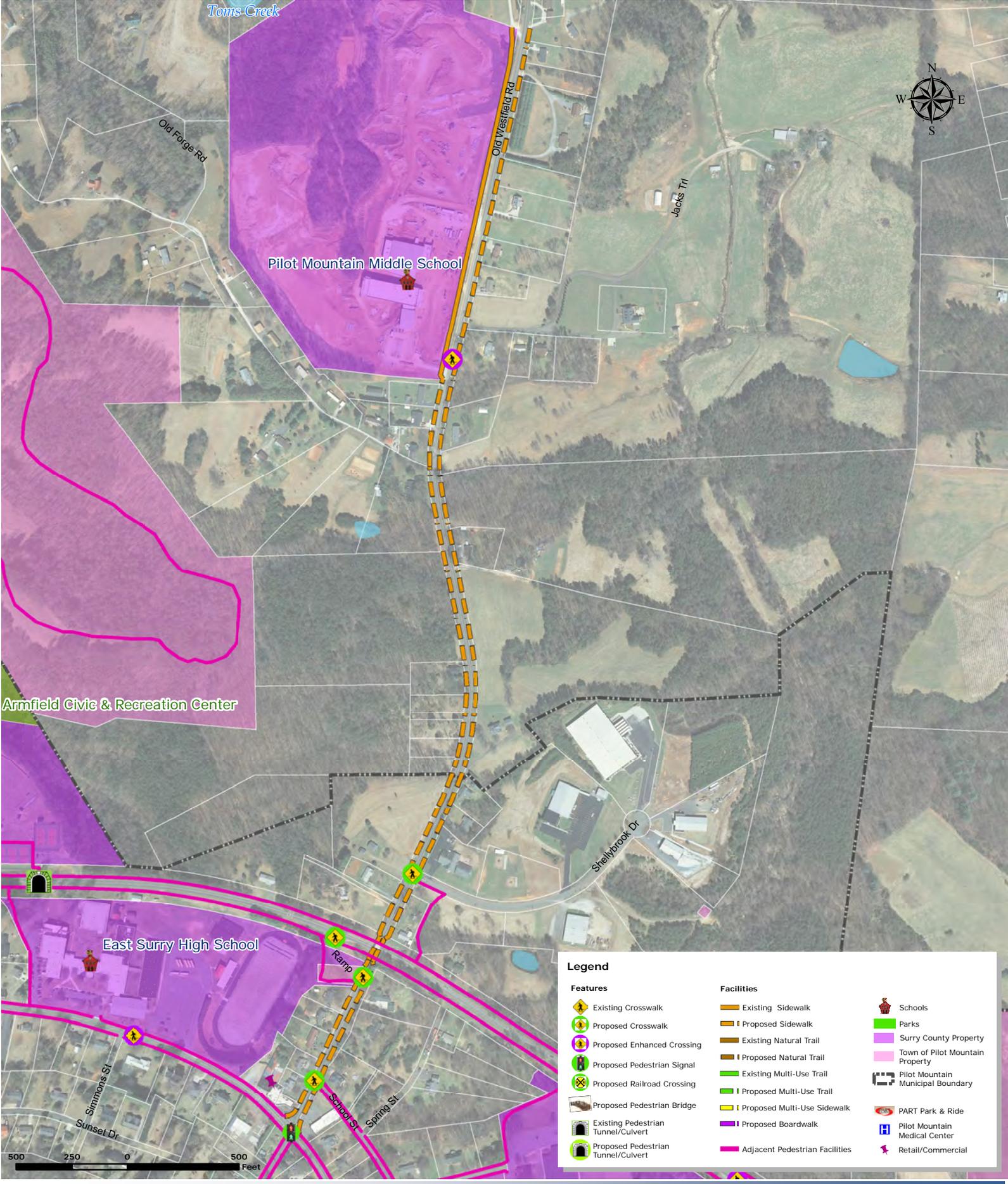


**PILOT CREEK GREENWAY
PHASES I, II, III
PROJECTS #41, 42, 43**



ESTIMATED SEGMENT COSTS

Multi-Use Trail:	\$938,480 - \$1,466,375
Multi-Use Sidewalk:	\$30,310 - \$47,630
Roadway Crossing(s):	\$1,000 - \$10,000
Pedestrian Culvert:	\$350,000 - \$400,000
Stream Crossing(s):	\$304,100 - \$369,700
Total Construction Estimate:	\$1,753,800 - \$2,477,200 (Includes 8% Contingency)



Legend

Features	Facilities	Other
Existing Crosswalk	Existing Sidewalk	Schools
Proposed Crosswalk	Proposed Sidewalk	Parks
Proposed Enhanced Crossing	Existing Natural Trail	Surry County Property
Proposed Pedestrian Signal	Proposed Natural Trail	Town of Pilot Mountain Property
Proposed Railroad Crossing	Existing Multi-Use Trail	Pilot Mountain Municipal Boundary
Proposed Pedestrian Bridge	Proposed Multi-Use Trail	PART Park & Ride
Existing Pedestrian Tunnel/Culvert	Proposed Multi-Use Sidewalk	Pilot Mountain Medical Center
Proposed Pedestrian Tunnel/Culvert	Proposed Boardwalk	Retail/Commercial
	Adjacent Pedestrian Facilities	



Town of Pilot Mountain

Focus Project - Old Westfield Road



OLD WESTFIELD ROAD

PROJECT #27

RESPONSIBLE ENTITY

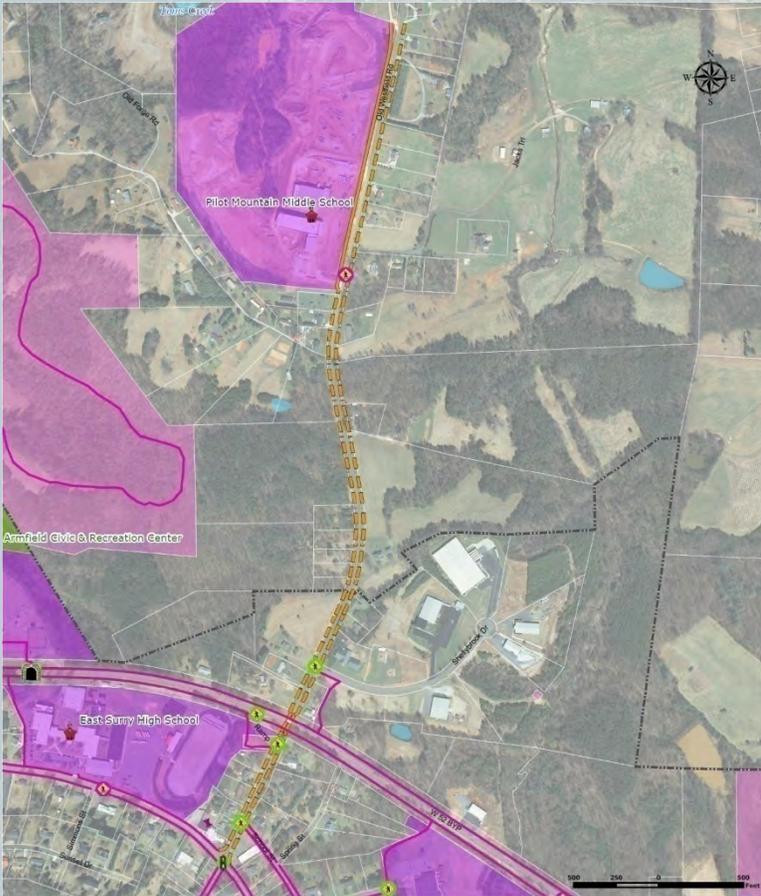
Town of Pilot Mountain
Surry County
NCDOT

FUNDING STRATEGY

Transportation Alternatives
Safe Routes to School
NCDOT TIP Funding

SEGMENT FACTS

Facility Type: Sidewalk
Total Length: 0.97 Miles
Existing Facilities: Sidewalk (0.31 Miles)
Stream Crossings: None
Road Crossings: Shellybrook Dr
School St



SEGMENT STATUS

Old Westfield Road extends from W Main St northward beyond Pilot Mountain Middle School. Currently there is existing sidewalk only along the school property frontage. Pilot Mountain stakeholders have indicated that installing pedestrian facilities to connect the middle school area to the town center is a top priority. An NCDOT bridge replacement project has been discussed for the existing bridge over Highway 52 Bypass.

The proposed project includes sidewalk on both sides of Old Westfield Rd from Pilot Mountain Middle School to W Main St.

IMPLEMENTATION CHALLENGES

The existing bridge over Highway 52 Bypass is very old, and has insufficient width for sidewalk installation. Any planned sidewalk project for Old Westfield Rd should be coordinated with NCDOT, however the bridge replacement project is not currently funded in the STIP. The NCDOT Bridge Policy should be referenced here:

<https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Bridge%20Policy.pdf>.

The proposed project includes four crossings of Old Westfield Rd, including an enhanced crossing employing a RRFB signal at the school location.

Final sidewalk design may impact several privately held properties and will likely require an easement acquisition strategy.



OLD WESTFIELD ROAD

PROJECT #27

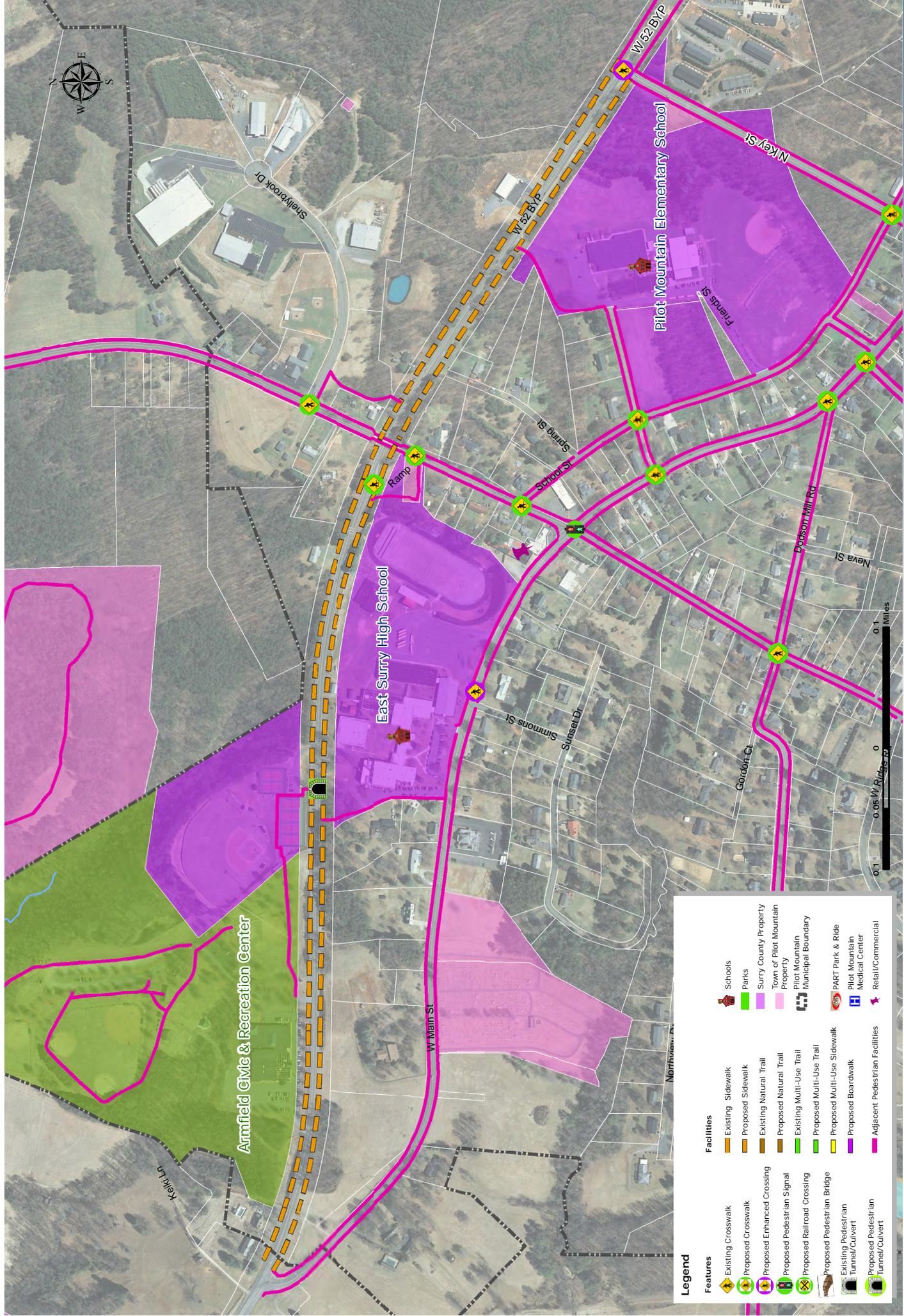


ESTIMATED SEGMENT COSTS

Sidewalk: \$326,500 – \$601,440

Roadway Crossings: \$17,000 – \$35,000
(Includes 1 RRFB)

Total Construction Estimate: \$370,980 - \$687,360
(Includes 8% Contingency)



Legend

Features	Facilities
Existing Crosswalk	Schools
Proposed Crosswalk	Parks
Proposed Enhanced Crossing	Surry County Property
Proposed Pedestrian Signal	Town of Pilot Mountain Property
Proposed Railroad Crossing	Pilot Mountain Property
Proposed Pedestrian Bridge	Municipal Boundary
Tunnel/Culvert	PART Park & Ride
Proposed Pedestrian Tunnel/Culvert	Pilot Mountain Medical Center
	Retail/Commercial

Town of Pilot Mountain

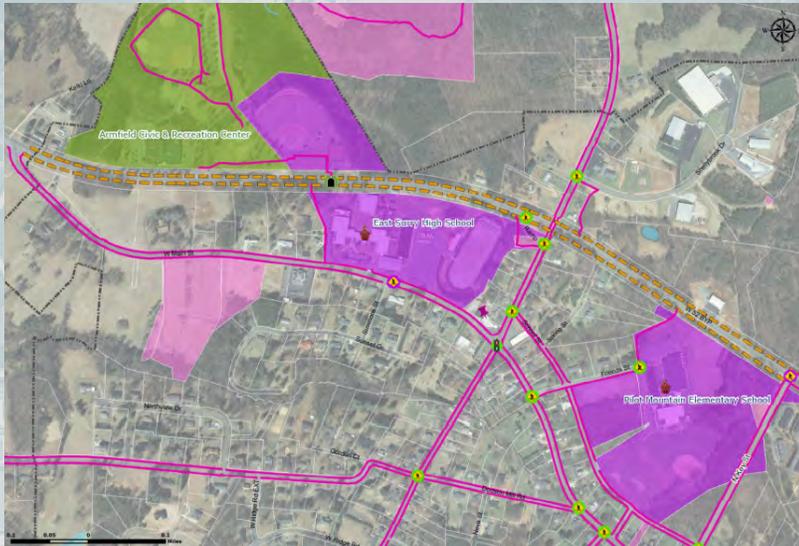
Focus Project - Highway 52 Bypass West





HIGHWAY 52 BYPASS WEST

PROJECT #15



RESPONSIBLE ENTITY

Town of Pilot Mountain
NCDOT

FUNDING STRATEGY

Transportation Alternatives
NCDOT SPOT Funding
Safe Routes to School
CMAQ Grant

SEGMENT FACTS

Facility Type:	Sidewalk
Total Length:	1.06 Miles
Existing Facilities:	None
Stream Crossings:	None
Road Crossings:	Hwy 52 Bypass 52 Bypass Ramp

SEGMENT STATUS

The *Highway 52 Bypass West* segment extends along the 52 Bypass corridor from N Key St to the intersection with W Main St. This segment connects directly with major community destinations and properties including Pilot Mountain Elementary School, East Surry High School, and Armfield Civic Center. The 52 Bypass corridor currently presents a significant barrier to pedestrian activity due to the significant ADT and truck traffic, and lack of pedestrian facilities.

The proposed project includes sidewalk on both sides of the 52 Bypass and two crosswalks. This project, and the corridor in general, should take advantage of the existing pedestrian tunnel under the roadway adjacent to the High School property.

IMPLEMENTATION CHALLENGES

This project includes one crossing of the 52 Bypass and one crossing of a ramp from the Bypass to Old Westfield Rd. An RRFB signal with pedestrian landscaping is proposed for the Bypass crossing.

150' of NCDOT right-of-way width exists along this corridor. Sidewalk construction can likely be completed within the existing right-of-way.



HIGHWAY 52 BYPASS WEST

PROJECT #15

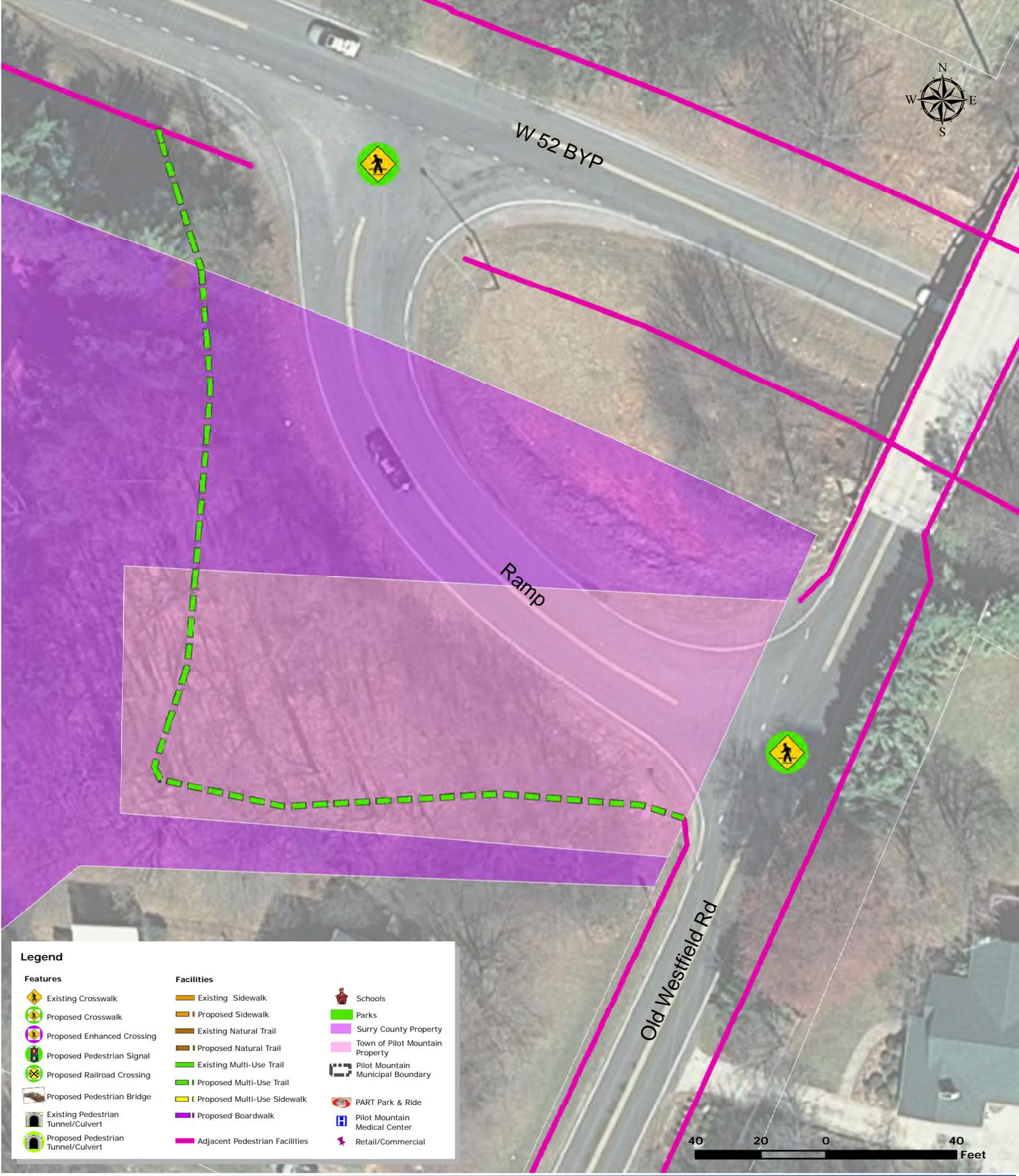


ESTIMATED SEGMENT COSTS

Sidewalk: \$501,930 - \$948,090

Roadway Crossings: \$17,000 – \$35,000
(Includes 1 RRFB)

Total Construction Estimate: \$560,450 - \$1,061,740
(Includes 8% Contingency)



Legend

Features	Facilities	
Existing Crosswalk	Existing Sidewalk	Schools
Proposed Crosswalk	Proposed Sidewalk	Parks
Proposed Enhanced Crossing	Existing Natural Trail	Surry County Property
Proposed Pedestrian Signal	Proposed Natural Trail	Town of Pilot Mountain Property
Proposed Railroad Crossing	Existing Multi-Use Trail	Pilot Mountain Municipal Boundary
Proposed Pedestrian Bridge	Proposed Multi-Use Trail	PART Park & Ride
Existing Pedestrian Tunnel/Culvert	Proposed Multi-Use Sidewalk	Pilot Mountain Medical Center
Proposed Pedestrian Tunnel/Culvert	Proposed Boardwalk	Retail/Commercial
	Adjacent Pedestrian Facilities	



Town of Pilot Mountain

Focus Project

Westfield - 52 Bypass Ramp Connector



WESTFIELD – 52 BYPASS RAMP CONNECTOR

PROJECT #26

RESPONSIBLE ENTITY

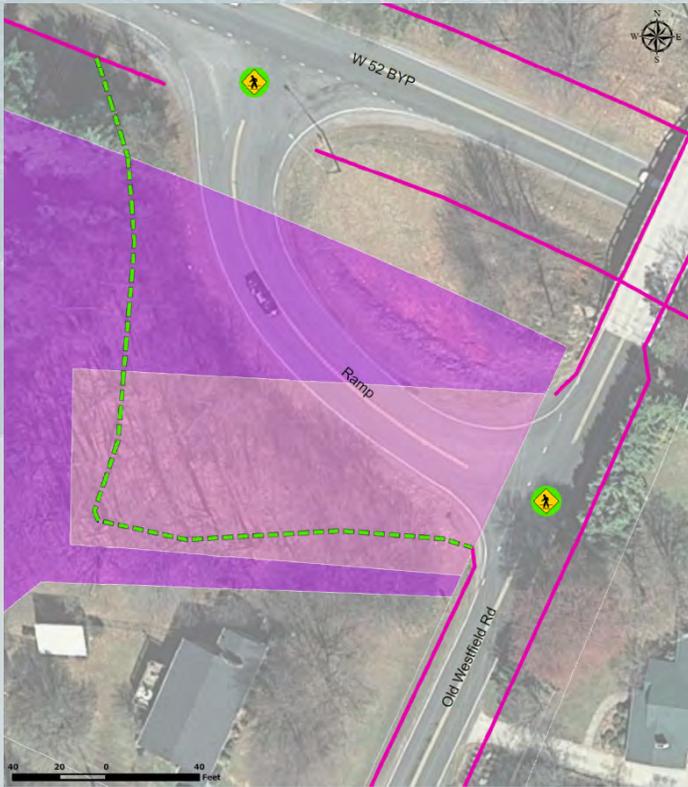
Town of Pilot Mountain

FUNDING STRATEGY

PARTF Grant
Transportation Alternatives

SEGMENT FACTS

Facility Type:	Multi-Use Trail
Total Length:	0.07 Miles
Existing Facilities:	None
Stream Crossings:	None
Road Crossings:	None



SEGMENT STATUS

The *Westfield – 52 Bypass Ramp Connector* is a short pedestrian facility proposed to be located adjacent to the existing ramp from the 52 Bypass to Old Westfield Rd. This segment will ultimately complete a direct pedestrian connection from Old Westfield Rd and Pilot Mountain Middle School to the 52 Bypass Corridor and Armfield Civic Center.

The proposed project includes a greenway/multi-use trail segment running generally parallel to the ramp. This segment will be located entirely on Surry County High School and Pilot Mountain town property.

IMPLEMENTATION CHALLENGES

A significant grade difference exists between Old Westfield Rd and the 52 Bypass. The greenway facility alignment must be designed to take advantage of existing slopes without resulting in too steep a grade.

The recommended alignment for this trail connection lies entirely within NCDOT right-of-way, Town property, and Surry County Board of Education property. A trail easement acquisition strategy is recommended for this project.



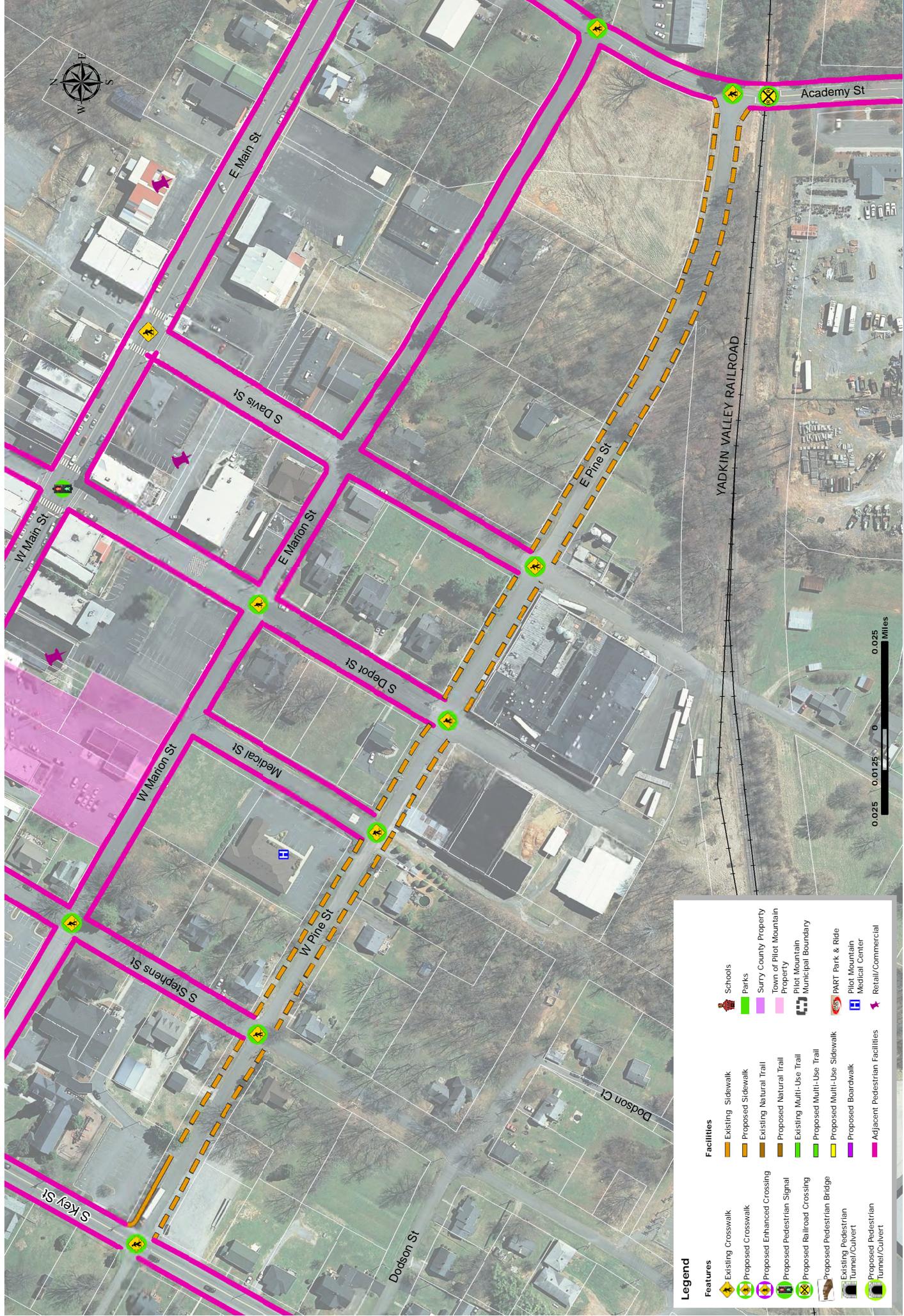
WESTFIELD - 52 BYPASS RAMP CONNECTOR

PROJECT #26

ESTIMATED SEGMENT COSTS

Multi-Use Trail: \$29,360 - \$45,875

Total Construction Estimate: \$31,710 - \$45,550
(Includes 8% Contingency)



Legend

Existing Crosswalk	Existing Sidewalk	Schools
Proposed Enhanced Crossing	Proposed Sidewalk	Parks
Proposed Pedestrian Signal	Existing Natural Trail	Surry County Property
Proposed Railroad Crossing	Proposed Natural Trail	Town of Pilot Mountain Property
Proposed Pedestrian Bridge	Existing Multi-Use Trail	Pilot Mountain Municipal Boundary
Existing Pedestrian Tunnel/Culvert	Proposed Multi-Use Trail	P&R Park & Ride
Proposed Pedestrian Tunnel/Culvert	Proposed Multi-Use Sidewalk	Pilot Mountain Medical Center
	Proposed Boardwalk	Retail/Commercial
	Adjacent Pedestrian Facilities	

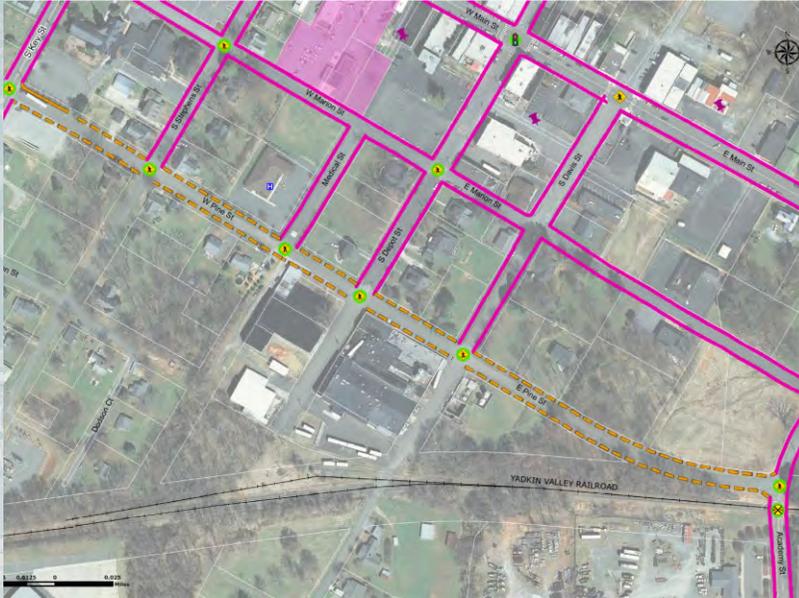
Town of Pilot Mountain

Focus Project - East - West Pine Street





EAST – WEST PINE STREET PROJECT #8



RESPONSIBLE ENTITY

Town of Pilot Mountain

FUNDING STRATEGY

Transportation Alternatives

SEGMENT FACTS

- Facility Type: Sidewalk
- Total Length: 0.37 Miles
- Existing Facilities: Sidewalk
(0.02 Miles)
- Stream Crossings: None
- Road Crossings: S Stephens St
Medical St, S Davis St
S Depot St

SEGMENT STATUS

The *East-West Pine Street* segment is an essential connection in establishing the “Downtown Loop” desired by Pilot Mountain. This project, in conjunction with others, will create a circular pedestrian route connecting Main St to less active portions of the downtown area.

This proposed project includes sidewalk on both sides of East and West Pine St from S Academy St to S Key St.

IMPLEMENTATION CHALLENGES

This segment will require several crosswalks at relatively low-volume cross streets.

The recommended alignment for this sidewalk project lies with existing NCDOT right-of-way. Where right-of-way width narrows, a sidewalk easement acquisition strategy may be required.



EAST – WEST PINE STREET

PROJECT #8



ESTIMATED SEGMENT COSTS

Sidewalk: \$186,190- \$333,740

Roadway Crossing(s): \$7,000 - \$70,000

Total Construction Estimate: \$208,650 - \$436,040
(Includes 8% Contingency)



Lynchburg Rd

S Key St

Legend

Features

- Existing Crosswalk
- Proposed Crosswalk
- Proposed Enhanced Crossing
- Proposed Pedestrian Signal
- Proposed Railroad Crossing
- Proposed Pedestrian Bridge
- Existing Pedestrian Tunnel/Culvert
- Proposed Pedestrian Tunnel/Culvert

Facilities

- Existing Sidewalk
- Proposed Sidewalk
- Existing Natural Trail
- Proposed Natural Trail
- Existing Multi-Use Trail
- Proposed Multi-Use Trail
- Proposed Multi-Use Sidewalk
- Proposed Boardwalk
- Adjacent Pedestrian Facilities

- Schools
- Parks
- Surry County Property
- Town of Pilot Mountain Property
- Pilot Mountain Municipal Boundary
- PART Park & Ride
- Pilot Mountain Medical Center
- Retail/Commercial

0.025 0.0125 0 0.025 Miles



Town of Pilot Mountain

Focus Project - Lynchburg - Key Connector



LYNCHBURG – KEY CONNECTOR

PROJECT #18

RESPONSIBLE ENTITY

Town of Pilot Mountain

FUNDING STRATEGY

Transportation Alternatives
CMAQ Grant
PARTF Grant
Recreational Trails Grant

SEGMENT FACTS

Facility Type: Multi-Use Trail
Total Length: 0.48 Miles
Existing Facilities: None
Stream Crossings: None
Road Crossings: None
Railroad Crossing: Yadkin Valley Railroad

IMPLEMENTATION CHALLENGES

The proposed segment will require an at-grade crossing of the Yadkin Valley Railroad.

The preferred route adjacent to several commercial properties may present owner/access conflicts. An alternative route accessing only town-owned property would present several design challenges.

A trail easement acquisition strategy is recommended for properties south of the Yadkin Valley Railroad.



SEGMENT STATUS

The *Lynchburg – Key Connector* provides a valuable pedestrian link between the pedestrian-scale neighborhoods concentrated west of downtown and the heavily trafficked commercial area of S Key Street. This link is favored by the Town due to its separation from vehicle traffic and roadway corridors.

The Key St connection is also significant in that it is less than 300 feet from a PART park & ride transit stop. This linkage effectively increases the mobility of pedestrian travelers.

The proposed project consists of a multi-use trail beginning at the southern end of Lynchburg Rd, running through the town-owned water treatment facility property, and out-letting at proposed pedestrian facilities on S Key St.



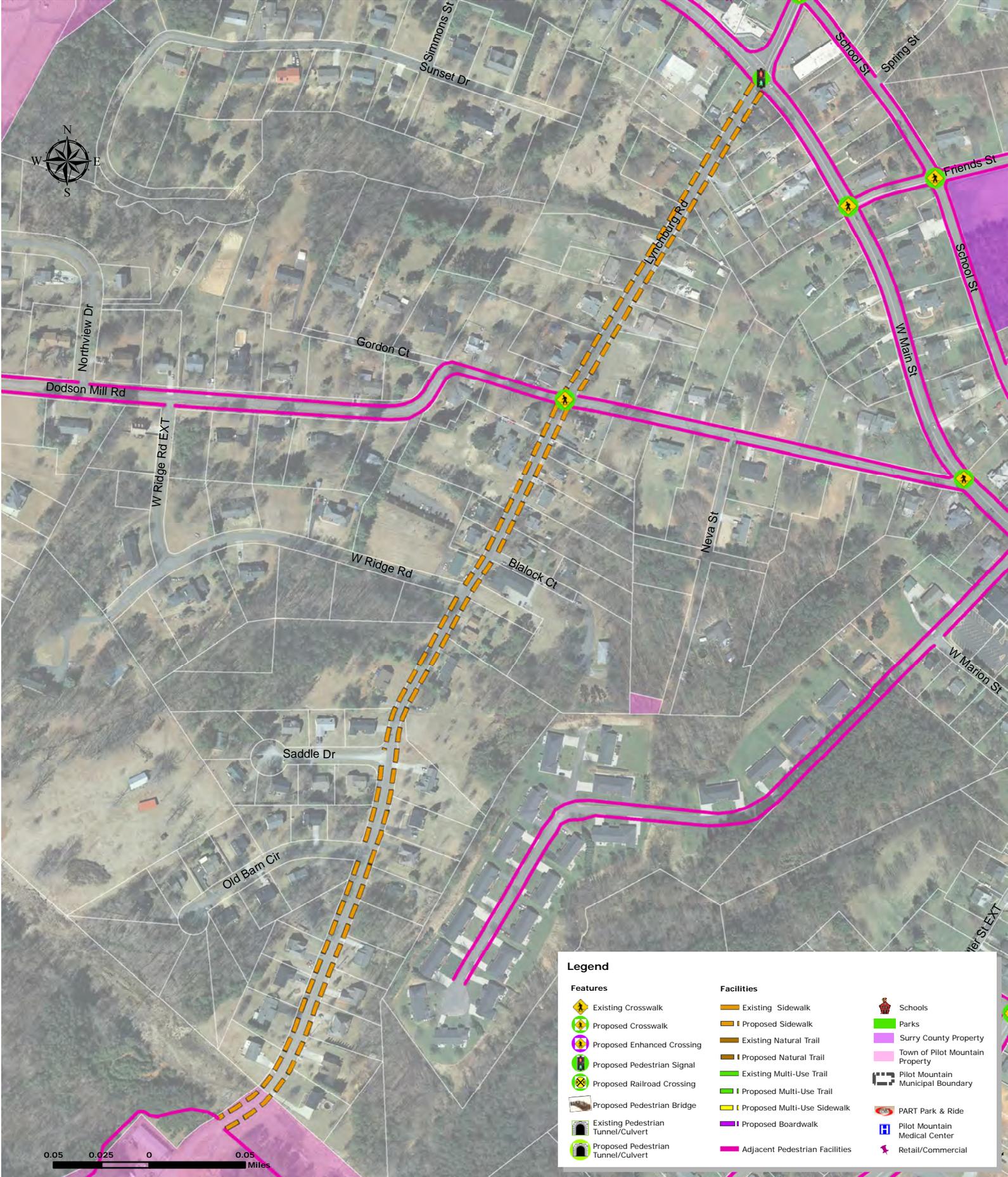
LYNCHBURG – KEY CONNECTOR

PROJECT #18



ESTIMATED SEGMENT COSTS

Multi-Use Trail:	\$202,960 - \$317,130
Railroad Crossing(s):	\$1,000 - \$5,000
Total Construction Estimate: (Includes 8% Contingency)	\$220,280 - \$347,900



Legend

Features	Facilities	Other
Existing Crosswalk	Existing Sidewalk	Schools
Proposed Crosswalk	Proposed Sidewalk	Parks
Proposed Enhanced Crossing	Existing Natural Trail	Surry County Property
Proposed Pedestrian Signal	Proposed Natural Trail	Town of Pilot Mountain Property
Proposed Railroad Crossing	Existing Multi-Use Trail	Pilot Mountain Municipal Boundary
Proposed Pedestrian Bridge	Proposed Multi-Use Trail	PART Park & Ride
Existing Pedestrian Tunnel/Culvert	Proposed Multi-Use Sidewalk	Pilot Mountain Medical Center
Proposed Pedestrian Tunnel/Culvert	Proposed Boardwalk	Retail/Commercial
	Adjacent Pedestrian Facilities	



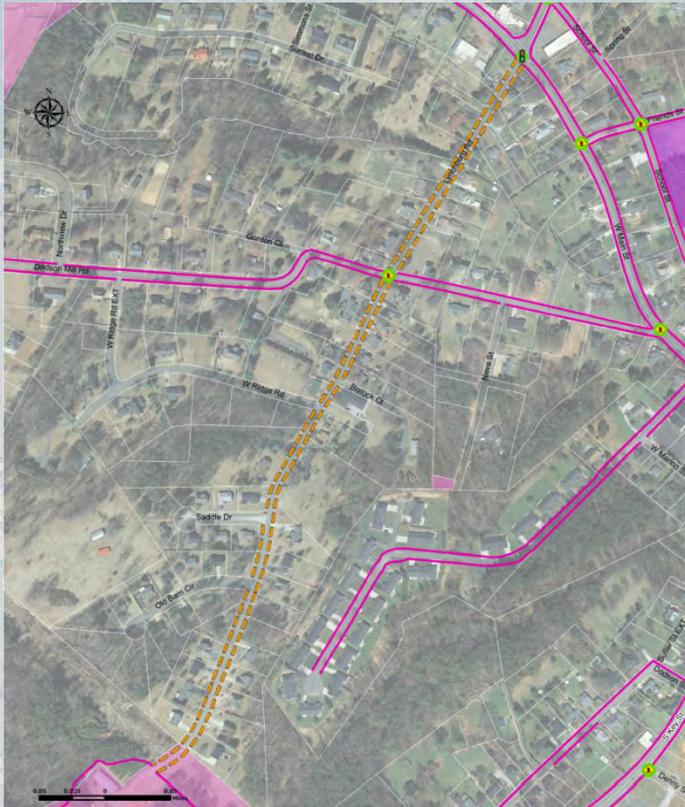
Town of Pilot Mountain

Focus Project - Lynchburg Road



LYNCHBURG ROAD

PROJECT #19



RESPONSIBLE ENTITY

Town of Pilot Mountain

FUNDING STRATEGY

Transportation Alternatives

SEGMENT FACTS

- Facility Type: Sidewalk
- Total Length: 0.62 Miles
- Existing Facilities: None
- Stream Crossings: None
- Road Crossings: Dodson Mill Rd

SEGMENT STATUS

The *Lynchburg Road* segment extends from W Main Street southward along the full length of Lynchburg Road. This corridor is important as it serves several neighborhoods with pedestrian scale development patterns, and would provide access to the existing and proposed pedestrian facilities to the north and south.

This proposed project calls for sidewalk on both sides of Lynchburg Road.

IMPLEMENTATION CHALLENGES

Recommended sidewalks along this segment will need to cross Dodson Mill Rd.

Given the narrow existing right-of-way width along this corridor, proposed sidewalk will likely impact several property owners. A sidewalk easements acquisition strategy is recommended for sidewalk construction in some instances.



LYNCHBURG ROAD

PROJECT #19

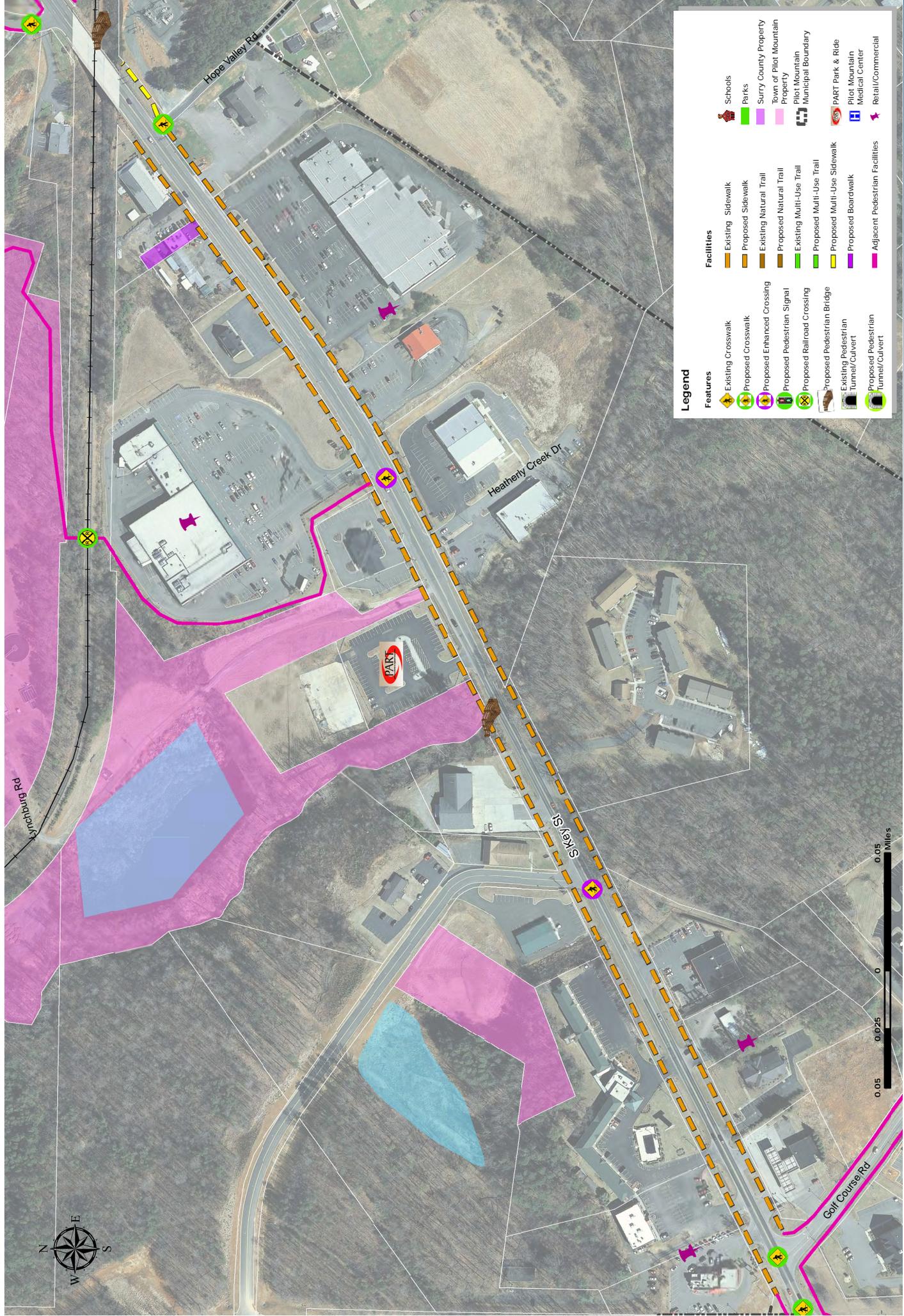


ESTIMATED SEGMENT COSTS

Sidewalk: \$239,020 - \$440,300

Roadway Crossing(s): \$2,000 - \$20,000

Total Construction Estimate: \$260,300 - \$497,130
(Includes 8% Contingency)



Legend	
	Existing Crosswalk
	Proposed Crosswalk
	Proposed Enhanced Crossing
	Proposed Pedestrian Signal
	Proposed Railroad Crossing
	Proposed Pedestrian Bridge
	Existing Pedestrian Tunnel/Culvert
	Proposed Pedestrian Tunnel/Culvert
	Existing Sidewalk
	Proposed Sidewalk
	Existing Natural Trail
	Proposed Natural Trail
	Existing Multi-Use Trail
	Proposed Multi-Use Trail
	Proposed Boardwalk
	Adjacent Pedestrian Facilities
	Schools
	Parks
	Surry County Property
	Town of Pilot Mountain Property
	Pilot Mountain Municipal Boundary
	PART Park & Ride
	Pilot Mountain Medical Center
	Retail/Commercial

Town of Pilot Mountain

Focus Project - S Key Street - Railroad South





SOUTH KEY STREET – RAILROAD SOUTH

PROJECT #34

RESPONSIBLE ENTITY

Town of Pilot Mountain

FUNDING STRATEGY

CMAQ Grant
Transportation Alternatives
Spot Safety Program

SEGMENT FACTS

Facility Type: Sidewalk
Multi-Use Sidewalk
Total Length: 0.59 Miles
Existing Facilities: None
Stream Crossings: Heatherly Creek
Road Crossings: Hope Valley Rd
Golf Course Rd

SEGMENT STATUS

The *South Key Street - Railroad South* segment extends from the railroad, south along Key St, terminating at the Hwy 52 interchange. Pedestrian facilities are critical along this segment for multiple reasons: increasing safety; providing pedestrian access to the commercial/retail corridor; and extending the overall pedestrian network south of downtown.

The proposed project includes sidewalk on both sides of S Key Street. Several road crossing are also proposed for the segment, including two crossings enhanced with Rectangular Rapid Flashing Beacons (RRFBs).

IMPLEMENTATION CHALLENGES

Proposed pedestrian facilities along this corridor will intersect many driveways.

Proposed road crossings along this segment will require enhanced signals – RRFB signals are recommended – and will benefit from enhanced landscaping.

A pedestrian bridge will be required to cross Heatherly Creek parallel to the existing drainage culvert.

Due to the drainage ditch cross section of the road, a sidewalk easement or fee simple right-of-way acquisition strategy is recommended for this project.





SOUTH KEY STREET – RAILROAD SOUTH

PROJECT #34



ESTIMATED SEGMENT COSTS

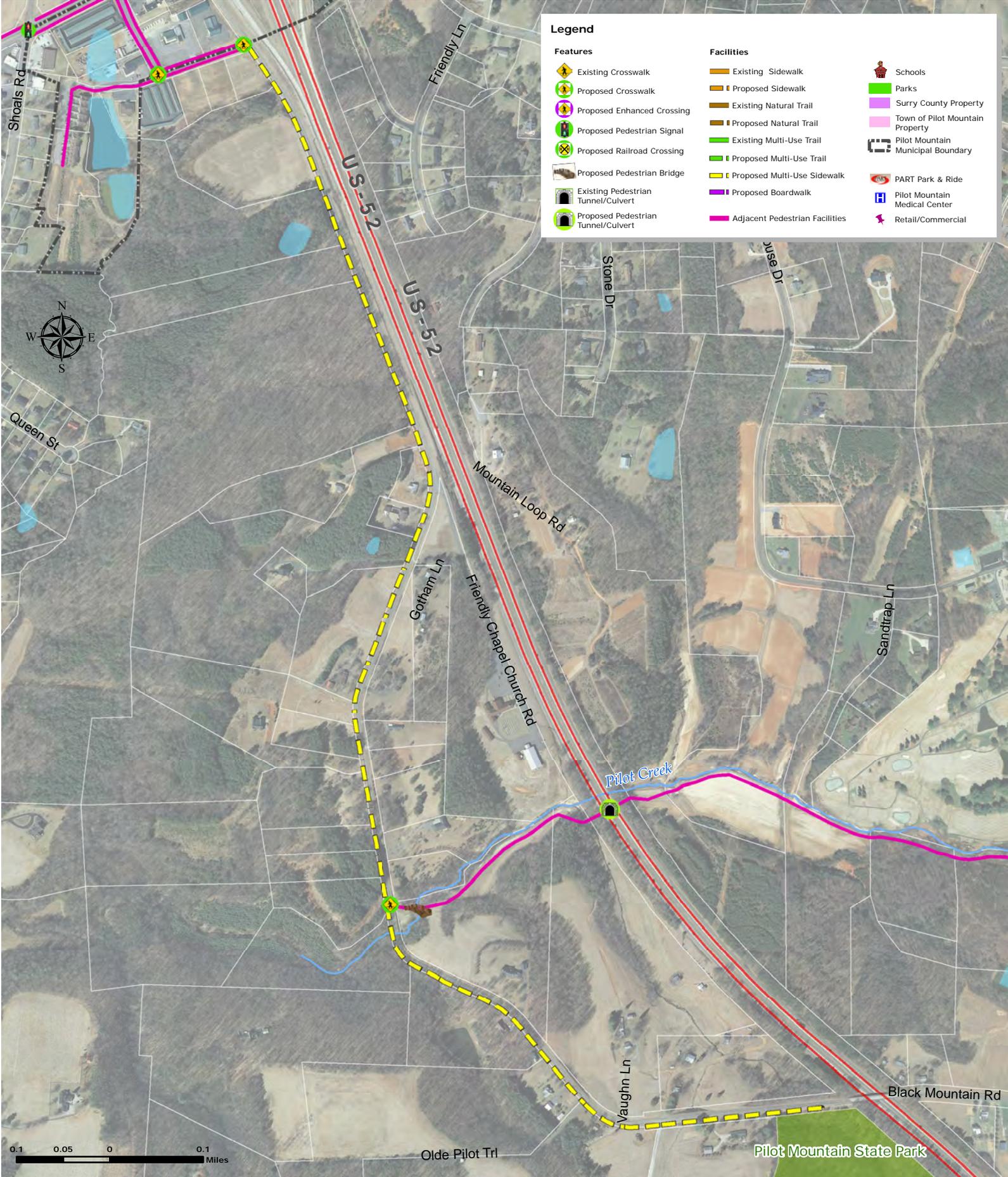
Multi-Use Sidewalk: \$10,360 - \$16,280

Sidewalk: \$262,530 – \$495,890

Roadway Crossings: \$62,000 - \$130,000
(Includes 2 RRFBs)

Stream Crossing(s): \$140,000 – \$165,000

Total Construction Estimate: \$512,880 - \$871,750
(Includes 8% Contingency)



Legend

Features	Facilities	Schools
Existing Crosswalk	Existing Sidewalk	Parks
Proposed Crosswalk	Proposed Sidewalk	Surry County Property
Proposed Enhanced Crossing	Existing Natural Trail	Town of Pilot Mountain Property
Proposed Pedestrian Signal	Proposed Natural Trail	Pilot Mountain Municipal Boundary
Proposed Railroad Crossing	Existing Multi-Use Trail	PART Park & Ride
Proposed Pedestrian Bridge	Proposed Multi-Use Trail	Pilot Mountain Medical Center
Existing Pedestrian Tunnel/Culvert	Proposed Multi-Use Sidewalk	Retail/Commercial
Proposed Pedestrian Tunnel/Culvert	Proposed Boardwalk	
	Adjacent Pedestrian Facilities	



Town of Pilot Mountain

Focus Project - Black Mountain Road



BLACK MOUNTAIN ROAD

PROJECT #3



RESPONSIBLE ENTITY

Town of Pilot Mountain
Surry County

FUNDING STRATEGY

Transportation Alternatives
Recreational Trails Grant
CMAQ Grant

SEGMENT FACTS

Facility Type:	Multi-Use Sidewalk
Total Length:	1.56 Miles
Existing Facilities:	None
Stream Crossings:	None
Road Crossings:	None

SEGMENT STATUS

The *Black Mountain Road* segment extends the full length of Black Mountain Rd, from Lola Ln at the northern end to Pilot Mountain State Park near US Highway 52. This connection provides a direct link between incorporated Town areas to the north and the Park. This segment also connects the Proposed *Pilot Creek Greenway* to the Park.

This proposed project will be a multi-use sidewalk, or "sidepath" along the west side of Black Mountain Rd.

IMPLEMENTATION CHALLENGES

There are no significant design challenges associated with this project.

Final design of the facility may impact adjacent properties, requiring the acquisition of easement.



BLACK MOUNTAIN ROAD

PROJECT #3



ESTIMATED SEGMENT COSTS

Multi-Use Sidewalk: \$576,870 - \$906,510

Total Construction Estimate: \$623,020 - \$979,030
(Includes 8% Contingency)





US HIGHWAY 52 INTERCHANGE

PROJECT #39



RESPONSIBLE ENTITY

Town of Pilot Mountain
NCDOT

FUNDING STRATEGY

NCDOT TIP Funding

SEGMENT FACTS

Facility Type: Sidewalk
Total Length: 0.17 Miles
Existing Facilities: None
Stream Crossings: None
Road Crossings:
6 Roundabout Crossing
Locations

SEGMENT STATUS

The *US Highway 52 Interchange* includes the S Key Street/Highway 268 road corridor from immediately northeast of the Highway 52 interchange to immediately southwest of the interchange. This roadway segment is unique from many other interchanges in that it employs single-lane roundabouts at the exit and entrance ramp terminals, rather than the typical ramp intersections.

This segment makes a critical connection between the main body of the municipal limits to the northeast, and the southwestern limits along Highway 268, Foothill Drive, and Lola Lane.

It will be essential to include sidewalks/pedestrian facilities in the design of any future NCDOT replacement of this bridge.

IMPLEMENTATION CHALLENGES

The existing bridge over US Highway 52 is relatively old and has insufficient width for sidewalks, as well as below (NCDOT) standard railing height.

The recently installed roundabouts have no pedestrian facilities (see Appendix for guidance on sidewalk with roundabout design).

The full length of this segment is within NCDOT right-of-way and will not require land acquisition.



US HIGHWAY 52 INTERCHANGE

PROJECT #39



ESTIMATED SEGMENT COSTS

Sidewalks: \$67,110 - \$123,620

Splitter Island Pedestrian Crossings: \$31,000 - \$90,000

Total Construction Estimate*: \$105,960 - \$230,710
(Includes 8% Contingency)

*Estimate does not include the likely significant cost of NCDOT bridge replacement.





3.4 Project Prioritization

Prioritization for recommended projects is essential to creating an *actionable* path to pedestrian connectivity for Pilot Mountain. A project scoring system has been developed for Pilot Mountain to prioritize potential projects based on reasonably objective criteria.

Projects are categorized at three levels of priority:

Short Term	1 – 5 Years	<i>36 – 45 Points</i>
Medium Term	5 – 10 Years	<i>26 – 35 Points</i>
Long Term	10 Years or Beyond	<i>15 – 25 Points</i>

In addition to Pilot Mountain’s vision for pedestrian connectivity, phasing of pedestrian-related projects can be affected by property constraints, land development, municipal boundaries, funding sources, and related infrastructure projects. Because of this, project prioritization must take into account the realities of project implementation. The following factors are considered in determining project priority and weighted accordingly in the scoring system:

Significance of the Project to Pilot Mountain Vision and Goals

Many of the recommended improvements have been developed to address specific goals or components of the Town vision. The ability of these projects to make a significant impact on pedestrian connectivity and enable other pedestrian goals for the Pilot Mountain Study Area has great bearing on their priority.



Criteria	Score
Addresses 4+ Goals/Vision Elements	15
Addresses 2-3 Goals/Vision Elements	12
Addresses 1 Goal/Vision Element	7

Addresses Immediate Safety Concern

Pedestrian safety is a primary consideration in both planning and implementing a pedestrian network. Existing safety concerns within a community can often be mitigated with simple and direct investment in crossings, safety features, or adjacent facilities.

Criteria	Score
Addresses Immediate Safety Concern(s)	15
Addresses No Immediate Safety Concern(s)	5



Connectivity Benefit of Resource Investment

This could be referred to as “bang-for-the-buck” criteria. Many of the recommended projects are smaller in scale, such as simple sidewalk connections, or present fewer property, utility, or environmental impacts. These projects can be completed quickly, or with minimal implementation barriers, while immediately enhancing pedestrian safety and connectivity for the Town.



Criteria	Score
3+ Corridor or Destination Connections	10
2 Corridor or Destination Connections	7
1 Corridor or Destination Connection	5
No Corridor or Destination Connections	2

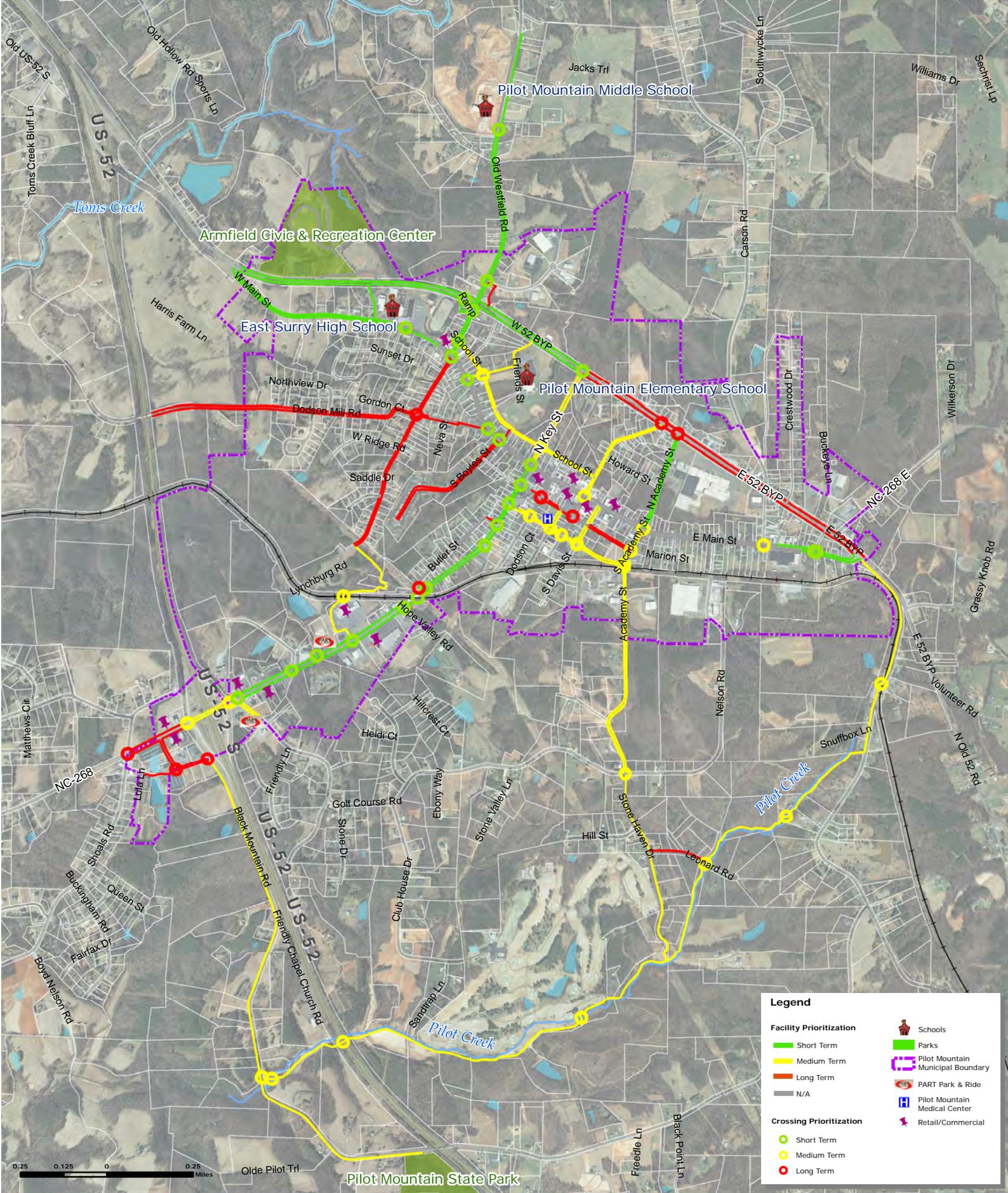
Project Status as a Component of Future or Likely NCDOT Project

Several of the recommended projects benefit from being a component of previously identified or likely NCDOT roadway or bridge projects. The likely schedule for these larger projects can be a determining factor in assigning priority for their pedestrian components. NCDOT’s policy addressing replacement of existing sidewalks and construction of new sidewalks in conjunction with transportation projects can be found here:

http://www.ncdot.gov/bikeped/download/bikeped_Ped_Policy.pdf.

Criteria	Score
Likely Funded Entirely by NCDOT	5
Likely Funded in Part by NCDOT	3
Likely not Funded by NCDOT	1

Prioritization of the respective intersection and crossing improvements corresponds to that of the associated sidewalk or trail.



0.25 0.125 0 0.25 Miles

Legend

Facility Prioritization	Schools
Short Term	Parks
Medium Term	Pilot Mountain Municipal Boundary
Long Term	P&R Park & Ride
N/A	Pilot Mountain Medical Center
Crossing Prioritization	Retail/Commercial
Short Term	
Medium Term	
Long Term	



Town of Pilot Mountain Pedestrian Plan Pedestrian Project Prioritization



Pilot Mountain Comprehensive Pedestrian Plan

Project #	Segment	Status	Pedestrian Facility	Project Limits	Priority	Vision/Goals Score	Safety Impact Score	Connectivity Score	NCDOT Project Score	Priority Score
1	Main St Neighborhood Crosswalks	Proposed	N/A	Old Westfield Rd – N Key St	Short	12	15	10	1	38
2	Dodson St	Proposed	Sidewalk	Key St - Butler St Ext	Long	7	5	5	1	18
3	Black Mountain Rd	Proposed	Multi-Use Sidewalk	Lola Ln - Pilot Mountain State Park	Medium	15	5	7	1	28
4	Butler St	Proposed	Sidewalk	Butler St Ext - S Key St	Long	7	5	5	1	18
5	Dodson Mill Rd	Proposed	Sidewalk	W Main St - Lynchburg Rd	Long	12	5	5	1	23
6	Shellybrook - 52 Bypass Connector	Proposed	Multi-Use Trail	Shellybrook Dr – W 52 Bypass	Long	7	5	7	1	20
7	East - West Marion St	Proposed	Sidewalk	S Key St - S Academy St	Long	12	5	7	1	25
8	East - West Pine St	Proposed	Sidewalk	S Key St - S Academy St	Medium	15	5	10	1	31
9	Elementary School Connector	Proposed	Multi-Use Trail	Friends St - W 52 Bypass	Medium	15	5	7	1	28
10	Foothill Dr	Proposed	Sidewalk	NC 268 - Lola Ln	Long	7	5	7	1	20
11	Friends St	Proposed	Sidewalk	School St - Elementary School Connector	Medium	15	5	7	1	28
12	Golf Course Rd	Proposed	Sidewalk	S Key St - PART Station	Medium	15	5	7	1	28
13	Main St West	Proposed	Sidewalk	Old Westfield Rd – W 52 Bypass	Short	12	15	10	1	38
14	Hwy 52 Bypass East	Proposed	Sidewalk	N Key St – Old Winston Rd	Long	12	5	7	1	25
15	Hwy 52 Bypass West	Proposed	Sidewalk	W Main St – N Key St	Short	12	15	10	3	40
16	Leonard Rd	Proposed	Multi-Use Sidewalk	Stone Haven Dr – Pilot Creek Greenway Phase II	Long	12	5	7	1	25
17	Lola Ln	Proposed	Sidewalk	Lola Ln - Black Mountain Rd	Long	12	5	5	1	23
18	Lynchburg - Key Connector	Proposed	Multi-Use Trail	Lynchburg Rd – S Key St	Medium	15	5	10	1	31
19	Lynchburg Rd	Proposed	Sidewalk	W Main St - Water Treatment	Long	12	5	7	1	25
20	Main Street - 52 Connector	Proposed	Multi-Use Trail	W Main St - W 52 Bypass	Short	12	15	10	1	38
21	Medical St	Proposed	Sidewalk	W Pine St - W Marion St	Medium	15	5	7	1	28
22	N Academy St	Proposed	Sidewalk	W Main St - E 52 Bypass	Short	15	15	10	1	41
23	N Depot St	Enhance Existing	Sidewalk	W Main St - E 52 Bypass	Medium	15	5	10	1	31

Green text indicates identified "Focus Project". See section 3.3 Focus Projects for detailed information.



Pilot Mountain Comprehensive Pedestrian Plan

Project #	Segment	Status	Pedestrian Facility	Project Limits	Priority	Vision/Goals Score	Safety Impact Score	Connectivity Score	NC DOT Project Score	Priority Score
24	N Key St	Proposed	Sidewalk	W Main St - W 52 Bypass	Medium	12	5	10	1	28
25	NC 268	Proposed	Sidewalk	Shoals Rd - US Hwy 52 Ramp	Medium	12	5	7	3	27
26	Old Westfield - Bypass Ramp Connector	Proposed	Multi-Use Trail	W 52 Bypass - Old Westfield Rd	Short	12	15	10	1	38
27	Old Westfield Rd	Proposed	Sidewalk	W Main St - Pilot Mountain Middle School	Short	12	15	10	3	40
28	Main St Downtown	Proposed	Sidewalk	Carson St - E 52 Bypass	Short	15	15	10	3	43
29	S Academy St	Proposed	Sidewalk	E Main St - Golf Course Rd	Medium	15	5	7	1	28
30	S Boyle St	Proposed	Sidewalk	W Main St - S Boyles St Terminus	Long	12	5	7	1	25
31	S Davis St	Proposed	Sidewalk	E Main St - E Pine St	Medium	15	5	5	1	26
32	Old Winston Rd	Proposed	Multi-Use Sidewalk	E Main St - Pilot Creek Greenway	Medium	15	5	10	3	33
33	S Key St - Railroad North	Proposed	Multi-Use Sidewalk	W Main St - Yadkin Valley Railroad	Short	15	15	10	3	43
34	S Key St - Railroad South	Proposed	Multi-Use Sidewalk	Yadkin Valley Railroad - Golf Course Rd	Short	15	15	10	3	43
35	Carson St Crosswalk	Proposed	N/A	N Main St & Carson St Intersection	Medium	12	5	7	3	27
36	School St	Proposed	Sidewalk	N Depot St - Old Westfield Rd	Medium	12	15	7	1	35
37	Stone Haven Dr	Proposed	Multi-Use Sidewalk	Leonard Rd - Pilot Creek Greenway	Medium	15	5	7	1	28
38	Swanson St	Enhance Existing	Sidewalk	W Main St - School St	Long	7	5	7	1	20
39	US Highway 52 Interchange	Proposed	Sidewalk	S Key St across US 52 Interchange	Medium	12	5	10	5	32
40	Main Street - Key Street Pedestrian Signal	Proposed	1 Proposed Pedestrian Signal	Main St & Key St Intersection	Short	15	15	7	5	42
41	Pilot Creek Greenway - Phase I	Proposed	Multi-Use Trail	Stone Haven Dr - US Hwy 52	Medium	15	5	10	0	30
42	Pilot Creek Greenway - Phase II	Proposed	Multi-Use Trail Multi-Use Sidewalk	Stone Haven Dr - Old Winston Rd	Medium	15	5	10	1	31
43	Pilot Creek Greenway - Phase III	Proposed	Multi-Use Trail	US Hwy 52 - Black Mountain Rd	Medium	15	5	10	1	31

Green text indicates identified "Focus Project". See section 3.3 Focus Projects for detailed information.



3.5 Policy Recommendations

Putting pedestrian-oriented policies in place at the local level is the key to ensuring that: pedestrian infrastructure is sustained through appropriate development and maintenance; pedestrian safety is reinforced through education, encouragement, and enforcement; and pedestrian-friendly communities are supported by local governing agencies.

Pedestrian and bicycle-oriented policies are currently in place at both the federal and state level, and are observed by NCDOT in the transportation planning process. The current NC Board of Transportation Resolution identifying bicycling and walking as a critical part of the State's transportation system can be found here:

http://www.ncdot.gov/bikeped/download/bikeped_laws_BOT_Mainstreaming_Resolution.pdf.

Sidewalk Requirements with Development

It is recommended that the Town enhance the existing ordinance requiring developers to construct sidewalk at the time of property development. The enhanced ordinance should include a provision for fee-in-lieu payments in instances where sidewalk construction is not feasible. Fee-in-lieu funds will allow Pilot Mountain to determine the most appropriate allocation of sidewalk or pedestrian improvement funds.

A model sidewalk ordinance is included below:

Section x.x Sidewalks

1. In any subdivision located within the jurisdiction of the town, sidewalks shall be constructed on one side of all streets with the exception of cul-de-sac streets less than 500 feet in length or on any existing soil street. Sidewalks are not required around the bulb of any cul-de-sac street.
2. Collector and arterial streets that abut the development on one side of the street shall include the construction of sidewalks on that side of the street for that portion of the development that abuts the street. Developments that abut both sides of a collector or arterial street shall include the construction of sidewalks on both sides of the street for that portion of the development that abuts the street.
3. In lieu of constructing the required sidewalk, a waiver may be granted by the Public Works director, with approval of the Town Manager whereby allowing the applicant to pay a fee in lieu of the required sidewalk construction. Fees paid in lieu of sidewalk construction shall be placed into a fund for sidewalk construction, to be managed by the Public Works Department.

Sidewalks shall be required on both sides of all streets, except:

1. On lots or sites engaged in active agricultural uses in the [Agricultural] district (in these instances, no sidewalks are required);



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2. In residential subdivisions where the average lot size is greater than 35,000 sf in area (in these instances, sidewalks are required on one side of the street);
3. Along alleys;
4. In cases where environmental or topographic conditions make such provision impractical; and
5. When an in-lieu fee consistent with the Town's fee schedule is determined to be appropriate by the Town.

The payment of fees, in-lieu of installing a required public sidewalk may occur at the request of the developer with approval of the Director of Public Works, upon finding that:

1. The street is designated as a state highway or route subject to widening or improvement in the foreseeable future;
2. The street is planned for improvement in accordance with the Town's maintenance plan;
3. Alternate on-site pedestrian facilities, such as trails, greenway, or multiuse paths, are adequate; or
4. The right-of-way, developing lot, or lot abutting a proposed sidewalk is not suitable for sidewalks due to floodplains, wetlands, riparian buffers, required tree canopy retention areas, slopes exceeding 25 percent, or other unique site conditions.

Pedestrian facilities and human scale development are also primary components of *Traditional Neighborhood Development* (TND). TND development typically employs higher than average residential densities and mixed use areas which tend to facilitate pedestrian transportation. NCDOT TND Guidelines can be found here: <http://ntl.bts.gov/lib/22000/22600/22616/tnd.pdf>.

Coordinate Pedestrian Requirements with Surry County

Much of the Pilot Mountain Study Area is within the jurisdiction of Surry County. It is recommended that the Town coordinate with the County to ensure that sidewalk requirements in the unincorporated areas of the Pilot Mountain region are similar, if not identical, to those in Pilot Mountain. Because Pilot Mountain's vision is likely different than that of the entire county, it may be desirable to designate an overlay area for the County with the relevant pedestrian requirements.



Reference Comprehensive Pedestrian Plan in Development Review Process

Pilot Mountain should require that both residential and commercial development approval processes include a review of proposed pedestrian facilities or safety enhancements, as recommended by this Comprehensive Pedestrian Plan. Developers or builders should be required to construct recommended facilities at the time of development as a condition of permit, development, or conditional zoning approval. In some cases, dedication of easement or payment of a fee-in-lieu of construction may be appropriate in order to ensure development of pedestrian facilities which extend beyond the limits of the property or have alternate funding sources. This will require formal adoption of the Pedestrian Comprehensive Plan document. This policy should be expanded to include Surry County development reviews within the Pilot Mountain Study Area.

3.6 Education, Encouragement, and Enforcement Recommendations

Pilot Mountain residents would be well-served by educational and encouragement programs aimed at teaching walking skills and safe practices to both children and adults, and facilitating a pedestrian friendly atmosphere. Creating safe walking opportunities for school-aged children is a primary objective of the Steering Committee and will be advanced by an educational program.

Recommendation 1: Establish a **“Be Your Own Pilot”** walking curriculum for elementary and middle school students in Pilot Mountain.

With support and funding from the Town of Pilot Mountain and Surry County Board of Education, Pilot Mountain elementary and middle schools should work with school administrators and teachers to identify target ages for safe walking educational messages. Using proven successful curricula as a guide, a curriculum tailored specifically to the Pilot Mountain community should be implemented.

The *Child Pedestrian Safety Curriculum*, developed by the National Highway Safety Administration (found here: <http://www.nhtsa.gov/ChildPedestrianSafetyCurriculum>), is recommended as a comprehensive, age-appropriate curriculum for primarily elementary-aged children. The program focuses on developing walking skills, and has had success as an educational component of Safe Routes to Schools in the Granville County, NC communities of Oxford and Butner (<http://www.saferoutesinfo.org/data-central/success-stories/north-carolina>). Similar resources for middle school children are available here: <http://www.saferoutesinfo.org/program-tools/what-are-some-good-classroom-resources-middle-school-students>.





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Recommendation 2: Establish a **“Be Your Own Pilot”** component educational program for adults.

With support and funding from the Town of Pilot Mountain and Surry County, Pilot Mountain should offer “Be Your Own Pilot” walking safety classes through Armfield Civic Center. Successful adult walking education programs typically include multiple forms of educational media such as videos, maps, posters, and materials which should be referenced in developing a recreation/safety curriculum for adults. Resources for adult educational programs are available here: <http://www.nhtsa.gov/Pedestrians>; and here: <http://www.rsa.unc.edu/psw/>. The curriculum should include promotion of Pilot Mountain’s walk-able destinations.

Recommendation 3: Institute Annual **“Walk to Work Day”**

Pilot Mountain should promote a “Walk to Work Day” as a means of encouraging walking as a viable means of local transportation. National “Walk to Work Day” has historically been held on the first Friday of April, beginning in 2004. The goal of the annual promotion is to encourage the public to walk to work for all or part of their commute to work.

An effective Walk to Work program should include partnerships with local employers, promotional efforts incorporating local media, increased enforcement, and safety enhancements to facilities where appropriate. Incentive-based programs can also be effective in encouraging participation. Pilot Mountain should consider soliciting the cooperation of PART to aid in promotion (“Walk to PART”).



Recommendation 4: Designate an on-foot police patrol for downtown Pilot Mountain

Pilot Mountain should work with the Police Department to determine if a downtown foot patrol is feasible, given available staff and resources. If so, a foot patrol route should be established to encourage pedestrian activity, reduce motor vehicle usage, and serve as a model for other agencies and organizations.

Included in an effective educational curriculum, should be North Carolina laws pertaining to bicycle and pedestrian travel. NCDOT law resources can be found here: <http://www.ncdot.gov/bikeped/lawspolicies/laws/default.html>. The pedestrian section of the NCDOT Laws Guidebook can be found here: http://www.ncdot.gov/bikeped/download/bikeped_laws_Guidebook-Part-2.pdf.



4 Project Implementation

4.1 Implementation Considerations

The implementation of recommendations set forth in Chapter 3 of this Comprehensive Pedestrian Plan involves a measure of planning in and of itself. Several factors should be considered when developing an appropriate implementation strategy.

Resources

Pilot Mountain's ability to implement the recommendations put forth in this plan will depend on the availability of staff, the availability of funding, and the opportunity for future land development. Other considerations may include future partnerships with Surry County or other regional partners, future funding sources, and future transportation projects.

Phasing of Programs and Infrastructure

Ideally, policy recommendations should be scheduled within a time-frame which will allow them to capitalize on planned infrastructure, and vice versa. Simply put, walking programs will have difficulty succeeding if there are no sidewalks on which to walk. For each task in the implementation schedule, care is taken to make sure that pertinent policy, program, or infrastructure tasks are scheduled for a corresponding time frame.

Safety Impacts

As is the case with project prioritization, safety is a primary consideration in implementation. Implementation recommendations should be developed in a manner which improves safety immediately, where necessary, and maintains a safe walking environment throughout the life of the pedestrian network.





Pilot Mountain Comprehensive Pedestrian Plan

Implementation Timeframe

Short Term Action Items (1-5 Years)	Responsible Agency/Department	Plan Reference
Adopt the Pilot Mountain Comprehensive Pedestrian Plan.	Pilot Mountain Board of Commissioners Pilot Mountain Planning & Zoning Board	Administrative Recommendation
Coordinate with Northwest Piedmont RPO to recommend short term priority pedestrian projects for inclusion in State Transportation Improvement Plan.	Northwest Piedmont RPO Pilot Mountain Town Management	Chapter 3: Project Recommendations, Project Prioritization
Apply for funding for pedestrian projects in coordination with recommended project prioritization.	Pilot Mountain Board of Commissioners Pilot Mountain Public Works Pilot Mountain Town Management	Chapter 3: Project Recommendations, Project Prioritization
Identify appropriate projects for Safe Routes to School project funding requests.	Pilot Mountain Board of Commissioners Northwest Piedmont RPO	Chapter 3: Project Recommendations, Project Recommendations
Revise current developer-constructed sidewalk requirement and establishing fee-in-lieu fund.	Pilot Mountain Board of Commissioners Pilot Mountain Planning & Zoning Board Public Works Department	Chapter 3: Project Recommendations, Project Recommendations
Re-evaluate pedestrian project prioritization, considering available funding, staffing, and TIP project designation.	Pilot Mountain Board of Commissioners Northwest Piedmont RPO	Chapter 3: Project Recommendations, Project Prioritization
Develop a schedule for identifying sidewalk hazards and implementing appropriate sidewalk access solutions.	Pilot Mountain Public Works Pilot Mountain Town Management	Chapter 3: Project Recommendations, Maintenance & Hazard Mitigation Recommendations
Coordinate with NCDOT Highway Division 11 to: identify and fund SPOT safety projects; and coordinate road resurfacing projects and schedule	Pilot Mountain Public Works Pilot Mountain Town Management	Chapter 3: Project Recommendations, Maintenance & Hazard Mitigation Recommendations
Medium Term Action Items (5-10 Years)	Responsible Agency/Department	Plan Reference
Coordinate designation of proposed Pilot Creek Greenway as <i>Mountains-to-Sea Trail</i> segment.	Northwest Piedmont RPO Pilot Mountain Board of Commissioners Surry County Parks & Recreation Pilot Mountain State Park	Chapter 3: Project Recommendations, Project Recommendations
Institute Annual "Walk to Work Day". Coordination with PART for "Walk to PART" is optional.	Pilot Mountain Board of Commissioners Piedmont Authority for Regional Transportation	Chapter 3: Project Recommendations, Policy Recommendations
Establish the "Be Your Own Pilot" walking curriculum for Pilot Mountain's elementary and middle school students.	Pilot Mountain Board of Commissioners Surry County Board of Education	Chapter 3: Project Recommendations, Policy Recommendations
Designate an on-foot police patrol for downtown Pilot Mountain	Pilot Mountain Town Management Pilot Mountain Police Department	Chapter 3: Project Recommendations, Policy Recommendations
Evaluate pedestrian network for additional Piedmont Area Regional Transportation (PART) park-and-ride locations - coordinate with PART.	Pilot Mountain Planning & Zoning Board Piedmont Authority for Regional Transportation Northwest Piedmont RPO	Administrative Recommendation
Evaluate existing and proposed roadway crossings for landscaping enhancements (safety).	Pilot Mountain Board of Commissioners Pilot Mountain Public Works NCDOT Division Office	Chapter 3: Project Recommendations, Project Recommendations
Re-evaluate pedestrian project prioritization, considering available funding, staffing, and TIP project designation.	Pilot Mountain Board of Commissioners Northwest Piedmont RPO	Chapter 3: Project Recommendations, Project Prioritization
Long Term Action Items (10 Years or Beyond)	Responsible Agency/Department	Plan Reference
Re-evaluate pedestrian project prioritization, considering available funding, staffing, and TIP project designation.	Pilot Mountain Board of Commissioners Northwest Piedmont RPO	Chapter 3: Project Recommendations, Project Recommendations



4.2 Primary Acquisition Strategies

Implementing the development of pedestrian infrastructure requires a toolbox of land and/or easement acquisition strategies. No one tool is appropriate for every potential land acquisition situation. When used judiciously, the various strategies identified below can be very effective in establishing a pedestrian network which is embraced by Pilot Mountain's stakeholders.

Fee Simple Purchase

Fee simple purchase is the most direct method of acquiring land (right-of-way or parcels) for pedestrian facilities – particularly greenway/trail corridors – however there may be drawbacks for both the purchaser and property owner. A fair market sale is often not as advantageous for a landowner due to capital gains taxes and selling costs, including real estate commissions. Also, Pilot Mountain, acting as the purchaser, may not have a significant budget with which to pay fair market value.

Trail or Sidewalk Easements

An easement is a legal agreement between a landowner and a private or government entity that permanently limits uses of the land in order to protect its conservation value. These easements allow landowners to retain ownership of their land while permitting specifically identified activities or construction on defined areas.

Land Donations

Land (parcels) or easements can be donated to Pilot Mountain or a land trust by any willing property owner. Land donation can be an attractive option for property owners who:

- Do not wish to pass the land on to heirs, or have no heirs
- Own highly appreciated property
- Have substantial real estate holdings and wish to reduce estate tax burdens
- No longer wish to manage a particular property

Land donation often provides substantial income tax deductions and estate tax benefits.

Developer Dedications

Developer dedications can be beneficial to both the developer and Pilot Mountain or a partnering land trust. If the dedicated property, or portion of property, is used for development of a recreational use, this can be a marketable amenity for the development. It can also be an opportunity for the land trust or Town to develop built-in support for the facility. Dedications can also be required by a local government if an adopted area plan or master plan is in place with a legal mechanism requiring dedication of identified areas at the time of development.



4.3 Summary of Funding Resources

Funding is an essential component of pedestrian projects; not only because it provides financial support for design and construction activities, but because the funding source can often dictate the ultimate design and function of the project.



Armfield Park Trailhead

The funding sources listed below should be considered for funding recommended projects identified in this plan.

Local

Pilot Mountain General Fund

The Town's General Fund allocates money, on an annual basis, for Town government operations and activities. The balanced budget for the 2012-2013 fiscal year allocates \$224,750 for *Public Works* and \$44,000 for *Streets*. This budgeted money may be a source of funding or matching funds for pedestrian projects – particularly sidewalk installation or crossing treatments.

Surry County General Fund

The Surry County General Fund depends on revenues primarily from property taxes, as well as service fees and grants. Money allocated for Economic and Community Development has been used in the past for recreational purposes within Pilot Mountain and the immediate surrounding area.



State & Federal

U.S. Department of Transportation, Recreational Trails Grants Program

The Federal Highway Trust Fund administers grant funding for the Recreational Trails Program (RTP). RTP is a reimbursement program, and funds can be applied to a variety of trail-related projects including maintenance and restoration of existing trails, rehabilitation of trailside facilities, construction of new trails, and acquisition of easements or property for trails. <http://www.fhwa.dot.gov/environment/rectrails/>

U.S. Department of Transportation, Transportation Alternatives Program (TAP)

The federal TAP program was authorized in 2012 under the Moving Ahead for Progress in the 21st Century (MAP-21) transportation funding bill. TAP effectively replaced the popular Transportation Enhancements Program

TAP provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for the planning, design or construction of boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.

U.S. Department of the Interior, National Park Service, Federal Land and Water Conservation Fund

In North Carolina, the Department of Environment and Natural Resources manages the Land and Water Conservation Fund, which is administered at the federal level by the U.S. Department of the Interior. In North Carolina, the annual grant of up to \$250,000 is available to counties, municipalities, public authorities, and the Eastern Band of the Cherokee Indian Tribe. State agencies responsible for the provision of outdoor recreation opportunities are also eligible. Eligible projects include land acquisition or development projects at a single site for the purpose of public outdoor recreation or to protect outstanding natural or scenic resources. Eligible projects must be in accordance with priorities listed in the state's Statewide Comprehensive Outdoor Recreation Plan action plan. http://www.ncparks.gov/About/grants/lwcf_main.php

NC Department of Parks & Recreation, NC Recreational Trails Grant

The NC Department of Parks & Recreation administers the NC Recreational Trails Grant Program for North Carolina. The annual grant of up to \$75,000 per applicant requires a 25% match and is available to local government agencies, non-profit corporations, private trail groups and public authorities. Eligible projects include trails and trail-related needs identified in the Statewide Comprehensive Outdoor Recreational Plan. http://www.ncparks.gov/About/trails_RTP.php



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NC Department of Parks & Recreation, NC Parks and Recreation Trust Fund

The NC Department of Parks & Recreation administers the NC Parks and Recreation Trust Fund (PARTF) Grant program, established in 1994. The annual grant of up to \$500,000 per applicant



requires a 50% match and is available to counties, incorporated municipalities, and public authorities authorized to acquire land. Two or more local governments can apply jointly, but one must serve as the primary sponsor. Eligible projects include purchasing land to use for recreational projects for the public or to protect the natural

or scenic resources of the property. Applicants can also request money to build or renovate recreational and support facilities. Projects must be located on a single site.

http://www.ncparks.gov/About/grants/partf_main.php

NC Adopt-A-Trail Grant Program

The Adopt-A-Trail program is operated by the Trails Section of the NC Division of State Parks. The program offers annual grants to local governments to build, renovate, maintain, sign and map, and create brochures for pedestrian trails. Grants are capped at approximately \$5,000 per project and do not require a match. A total of \$108,000 in Adopt-A-Trail money is awarded annually to government agencies.

http://www.ncparks.gov/About/trails_AAT.php

Safe Routes to School (SRTS)

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 method of transportation for children. SRTS 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 schools. The North Carolina Safe Routes to School Program is supported by federal funds through SAFETEA-LU and MAP-21 legislation.

Different types of reimbursable funding opportunities are available through this program which include; Action Plans or School Travel Plans, Non-Infrastructure Program funding, Infrastructure Program funding, and Highway Division Funds. Please note that all SRTS projects "shall be treated as projects on a Federal-aid system under chapter 1 of title 23, United States Code." Although no local match is required and all SRTS projects are 100% federally funded, agencies are encouraged to leverage other funding sources that may be available to them, including grant awards, local, state, or other federal funding. SRTS funds can be used for any school public or private, K-8, in a municipality or in the county jurisdiction.



Raleigh, NC.

Photo courtesy of K. Cardenas.

<http://www.iwalktoschool.org>



The following provides information about the program.

- **Action Plans or School Travel Plans:** These are plans to improve pedestrian and bicycle safety within a two-mile radius of schools that are grades K-8. The Action Plans provide a framework for identifying projects, programs and activities that will make walking and bicycling to school safer and more appealing.
- **Non-Infrastructure Funds:** are used for pedestrian and bicycle education, encouragement, evaluation and enforcement. These grants are good for developing programs that inspire children to walk and bike to school.
- **Infrastructure Funds:** 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 typically range from \$100,000 to \$300,000 per project. Types of projects may include sidewalk improvements, crossing improvements, on-street bike and pedestrian improvements, bike parking, traffic calming, and traffic separation devices among others. An adopted Comprehensive Transportation Plan or other type of pedestrian and bicycle plan that identifies needed infrastructure improvements is helpful in obtaining these grants.
- **Highway Division Funds:** are funds that are allocated by each of NCDOT's 14 Highway Divisions and the SRTS office 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 funding amounts can be used to improve conditions for walking and biking to school.

Contact info:

Ed Johnson, ASLA, RLA

SRTS Coordinator

NCDOT, Division of Bicycle and Pedestrian Transportation

1552 Mail Service Center

Raleigh, NC 27699-1552

Email: erjohnson2@ncdot.gov

919.707.2604

Spot Safety

The Spot Safety Program is state-funded program administered by NCDOT and used to develop smaller improvement projects to address safety, potential safety, and operational issues. The program currently receives approximately \$9 million per state fiscal year and allows for a maximum contribution of \$250,000 per project. A Safety Oversight Committee (SOC) reviews and recommends Spot Safety projects to the Board of Transportation (BOT) for approval and funding. Criteria used by the SOC to select projects for recommendation to the BOT include, but are not limited to, the frequency of correctable crashes, severity of crashes, traffic delay, traffic congestion, number of signal warrants met, effect on pedestrians and schools, NCDOT division and regional priorities, and public interest.

<https://connect.ncdot.gov/resources/safety/Pages/NC-Highway-Safety-Program-and-Projects.aspx>



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State Street-Aid (Powell Bill)

State street-aid (Powell Bill) allocations are made annually to incorporated municipalities which establish their eligibility and qualify for funding as required by NC general statute. The general statutes require that a sum distributed in two allocations to the qualifying municipalities equal to the amount produced during the fiscal year by 1-3/4 cents on each taxed gallon of motor fuel. The statutes also provide that funds be disbursed to the qualified municipalities on or before October 1st and January 1st thereby allowing sufficient time after the end of the fiscal year for verification of information and to determine the proper allocations and preparation of disbursements. Powell Bill funds are designated only for the purposes of maintaining, repairing, constructing, reconstructing, or widening local streets which are maintained by the respective municipality. Funds are also available for planning, construction, and maintenance of bikeways or sidewalks along public streets and highways.

<https://connect.ncdot.gov/municipalities/State-Street-Aid/Pages/default.aspx>

NCDOT Sidewalk Program

Each year, a total of \$1.4 million in STP-Enhancement funding is set aside for sidewalk construction, maintenance and repair. Each of the 14 highway divisions across the state receives \$100,000 annually for this purpose. Funding decisions are made by the district engineer. Prospective applicants are encouraged to contact their district engineer for information on how to apply for funding.

Governor's Highway Safety Program (GHSP)

The Governor's Highway Safety Program is in place to promote highway safety awareness and reduce the number of traffic crashes and fatalities in North Carolina through the planning and execution of safety programs.



In addition to popular programs such as the "Booze It & Lose It" and "Click It or Ticket" campaigns aimed at vehicle safety, GHSP funds other programs aimed at meeting the following goals:

1. To reduce the number of serious injuries and fatalities on the State's roadways through the efficient use of both public and private highway safety resources at the local, state and national levels.
2. To develop and implement a strategic Highway Safety Plan (HSP) that identifies problems and appropriate countermeasures in the nine national priority program areas:
 - Alcohol and Other Drug Countermeasures
 - Police Traffic Services
 - Occupant Protection
 - Traffic Records



- Emergency Medical Services
 - Motorcycle Safety
 - Pedestrian and Bicycle Safety
 - Speed Control
 - Roadside Safety
3. To develop, cultivate, implement, and evaluate innovative highway safety countermeasures.
 4. To increase public awareness of highway safety issues and the impact it has on North Carolina.
 5. To provide technical assistance, including training, to communities, state agencies, key practitioners, and the private sector.
 6. To improve the effectiveness of the Governor's Highway Safety Program and its ability to respond to new and evolving highway safety issues.

GHSP offers reimbursement grants for programs designed to meet the above goals. Projects are approved for only one full or partial federal fiscal year at a time. Projects may be funded for up to three consecutive years. All funding is performance-based, and significant progress in reducing crashes, injuries and fatalities is required as a condition of continued funding.

<http://www.ncdot.gov/programs/ghsp/>

Additional Funding Information

- NCDOT annually sets aside \$6 million for the construction of bicycle and pedestrian improvements that are independent of scheduled highway projects in communities throughout the state. Types of projects include shared-use paths, wide-paved shoulders, bike lanes, and sidewalks. These independent projects are funded through the Strategic Prioritization/State Transportation Improvement Program (STIP) process.
- The strategic prioritization process serves as the primary input source for the STIP. Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), NCDOT Divisions, and the Division of Bicycle and Pedestrian Transportation (DBPT) as well as other units at NCDOT may submit projects through the prioritization process. For bike and pedestrian projects, the DBPT utilizes a project prioritization methodology with defined criteria to rank all bike/pedestrian projects. This process occurs every two years. Priority projects are included in the developmental STIP (years 6 to 10) and the 10-year Program & Resource Plan.
- Bicycle and pedestrian accommodations such as bike lanes, widened paved shoulders, sidewalks and bicycle-safe bridge design are frequently funded as incidental features of highway projects. Most pedestrian safety accommodations built by NCDOT are included as part of scheduled highway improvement projects funded with a combination of federal and state roadway construction funds or with a local fund match.



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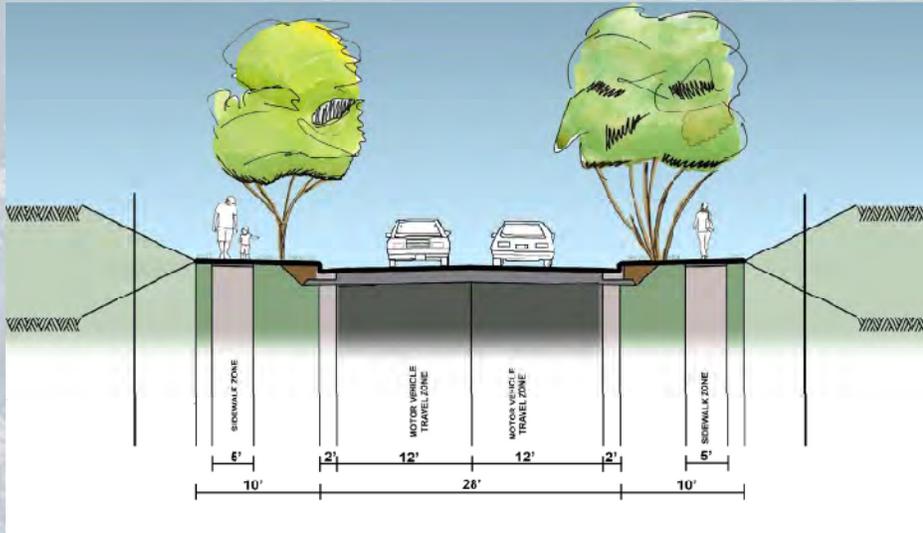
Appendix 1:
Design Guidelines



Pilot Mountain Comprehensive Pedestrian Plan

Sidewalks

A sidewalk is a basic facility designed to provide pedestrians with access to destinations and land uses located along road corridors or within individual neighborhoods. Sidewalks are most effective for pedestrian transportation when they are continuous, located on both sides of the street, and wide enough to accommodate multiple pedestrians walking side by side. NCDOT utilizes sidewalk design guidelines established by the American Association of State Highway and Transportation Officials (AASHTO) and the Manual on Uniform Traffic Control Devices (MUTCD).



A minimum sidewalk width of 5' is required by NCDOT design standards. Where sidewalks facilities are included along bridge structures, a minimum width of 5.5' is required in combination with a minimum 42" railing.



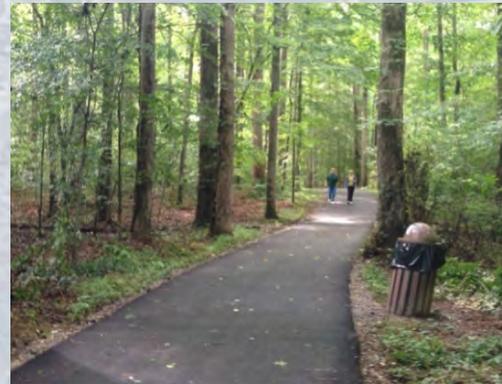
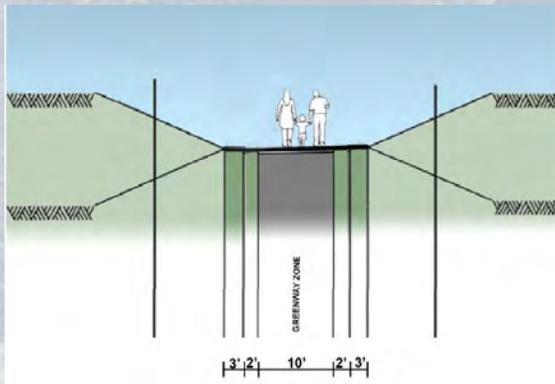
Where feasible, sidewalks should be buffered from roadway travel lanes by planting strips or vegetated barriers of at least 3'. Where the roadway cross section includes drainage ditches, rather than curb and gutter, sidewalk should be placed behind the back slope of the ditch.



Greenways/Multi-Use Trails

Multi-use trails are typically paved paths intended to serve multiple modes of travel including walking, jogging, bicycling, and other forms of non-motorized transport. Multi-use trail facilities and *greenway* facilities are typically similar in design; the term “greenway” often refers to facilities located in natural areas, designed with adequate vertical and horizontal clearance for users, and may be designed to minimize effects on environmentally sensitive areas. Unlike sidewalks, multi-use trail alignments are not dependent on roadway corridors and can be designed to make more direct connections to destinations within a community.

Multi-use trail design includes a minimum recommended width of 10 feet. Paved facilities are typically designed with a 2' gravel shoulder. At a minimum, 8' of vertical clearance is recommended for all trail facilities.



Multi-Use Sidewalk

Multi-Use Sidewalk, or sidepath, is a hybrid pedestrian facility designed to combine the appeal and utility of a multi-use trail with the connectivity and access of a sidewalk. These facilities are an excellent option for establishing a trail function within existing or planned roadway rights-of-way. Sidepaths can be narrower in width than the standard 10' multi-use trail cross section, but should have a minimum width of 8', in order to accommodate multiple users at a time.



Multi-use sidewalks are an appropriate design tool along roadway corridors with a minimum number of driveways, or curb-cuts, and significant lengths between intersections.



Natural Trail

Natural trails are primitive-surface pedestrian facilities, primarily located in natural and environmentally sensitive areas. These trails require a minimum amount of maintenance, and are most effective when enhanced with appropriate way-finding signage. A minimum of 8' of vertical clearance is recommended for natural trails.



Crosswalks

High-visibility crosswalks are an essential component for a safe and effective pedestrian network. Crosswalks, at both intersections and mid-block locations, provide a place for pedestrians to cross roadway facilities which can often be a barrier to pedestrian travel within a community. Ensuring that crosswalks are highly visible to vehicular traffic is essential in ensuring the safety of crossing pedestrians. Crosswalks should utilize high-visibility crosswalk striping and design as well as high-visibility signage which can be seen at a safe distance by walkers and drivers alike.



Crosswalks utilizing longitudinal lines (parallel to vehicle path) are recommended for crossings in Pilot Mountain. The following guidelines are recommended for crosswalk design:

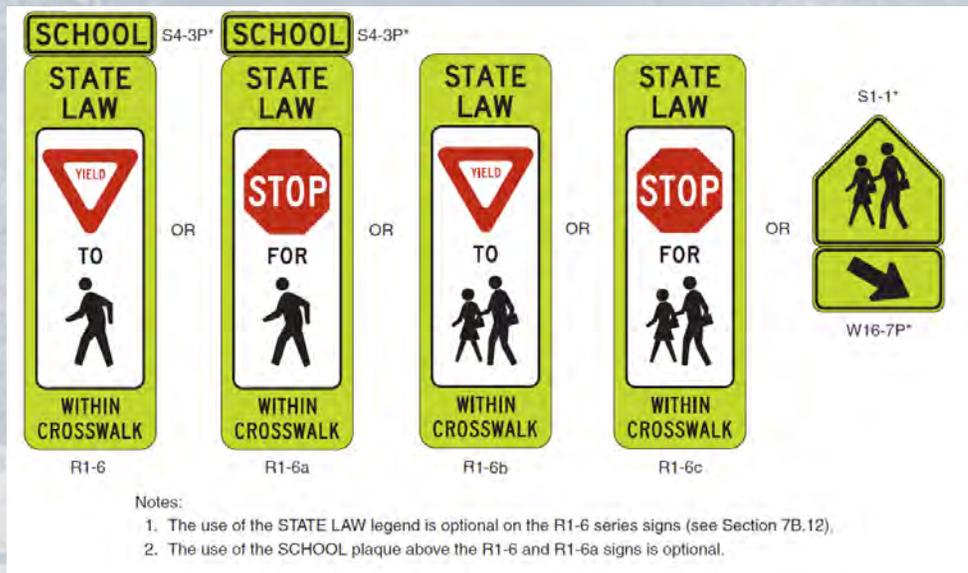
- The longitudinal lines should be 12" to 24" wide and separated by gaps of 12" to 60". The gap between the lines should not exceed 2.5 times the width of the longitudinal lines.



- The design of the lines and gaps should avoid the wheel paths of vehicles where possible.
- Crosswalk markings should be located so that any associated curb ramps are within the width of the crosswalk.

NCDOT requires pedestrian facilities on both sides of a roadway facility when installing crosswalks.

North Carolina state law requires that drivers *stop* for pedestrians in crosswalks. Standards for relevant signage, typically located in the crosswalk at the roadway centerline, are below.



Courtesy of *Manual on Uniform Traffic Control Devices 2009*

Mid-Block Crossings

NCDOT defines mid-block crossings as “any crosswalk that is not located within an intersection” (NCDOT Standard Practice for Crosswalk – Mid-Block Signing). Mid-block crossings are often a necessary pedestrian solution in built environments. By nature of their placement, these crossings typically require additional safety, warning, and visibility enhancements.

The following guidelines are recommended for the application of mid-block crossings:

- Mid-block crosswalks should not be installed within 300’ of another signalized crossing.
- Advanced warning signs and landscaping features (optional) should be utilized where mid-block crossings are present.
- Raised crosswalks are typically used on two-lane streets with posted speed limits below 35 mph.
- Median crossings should be at least 6 feet in width with a level landing that is at least four feet square, providing a balanced resting space.



Additional standards and implementation guidance on mid-block crossings should be referenced in the *NCDOT Division of Highways, Traffic Engineering and Safety Systems Branch Standard Practice for Crosswalks – Mid-Block (Unsignalized) Signing* document, found here: https://connect.ncdot.gov/resources/safety/Tepl/TEPPL%20All%20Documents%20Library/C-36_pr.pdf

Curb Ramps

Curb ramps are important to the function and accessibility of sidewalks and crossings. These features address ADA accessibility concerns by creating a smooth transition between sidewalks or elevated paths, and roadway grades at crossing locations. Curb ramps are typically designed with detectable warning surfaces, which serve as a cue to visually impaired pedestrians that they are transitioning between the sidewalk and street.

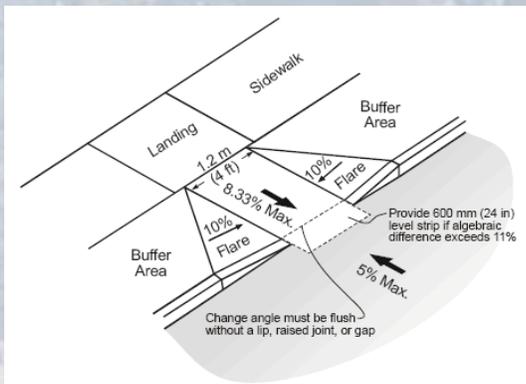


Image courtesy of www.fhwa.gov

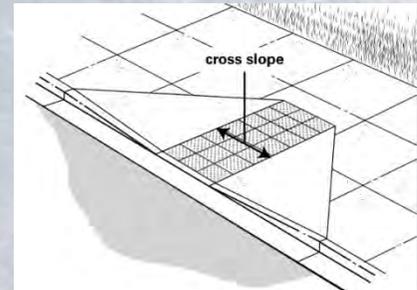


Curb Extension with Curb Ramp, W Main Street



Driveway Crossings

Driveway crossings (also referred to as “curb cuts”) can present a challenge to pedestrian travel when located frequently along a corridor. This is due not only to the presence of vehicle traffic, but also to the actual design of the crossing itself. Driveway crossings must be designed appropriately to allow pedestrians to cross freely over the vehicle path, and allow vehicles to cross the sidewalk and enter the street.



Pedestrian travel can be negatively impacted by potential *change* in the cross slope along the sidewalk or path. Driveway crossings are the most common location for changes in cross slope within a pedestrian corridor. Cross slopes are not permitted to exceed 2% and changes in cross slopes are permitted between 0-2% only. When the change of cross slope is significant, one wheel of a wheelchair or one leg of a walker may lose contact with the ground causing the user to fall.



In addition to other less than desirable conditions, the image to the left displays a hazardous driveway crossing where the changes in cross slope are poorly designed and not conducive to pedestrian travel (and likely not traversable by wheelchairs).

Driveway crossings along sidewalks buffered by planting strips should be designed with level landings and returned curbs (see images below). Using returned curbs instead of flares forces motorists to enter the driveway crossing at more of a right angle and slower speed, benefitting pedestrian safety.

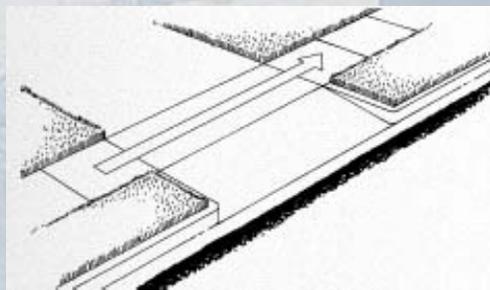
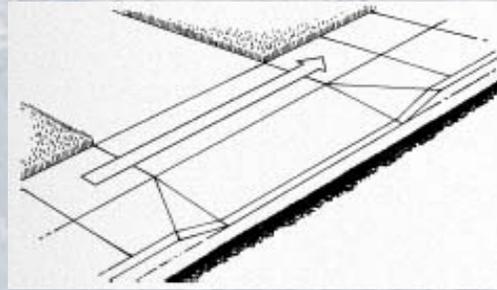


Image courtesy of www.fhwa.gov



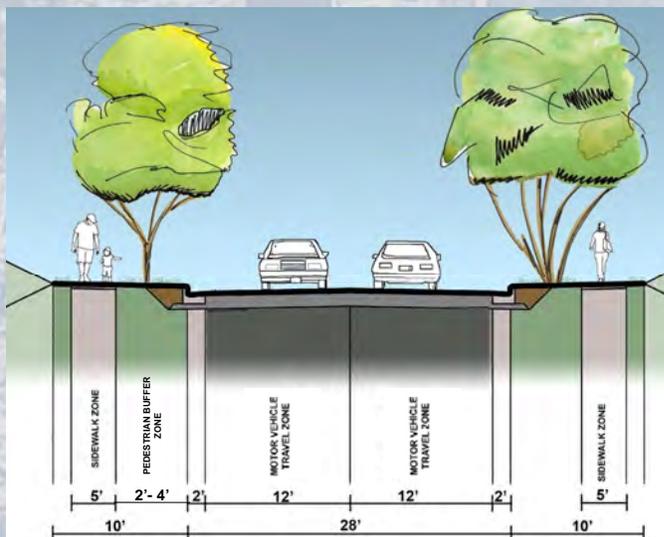
Pilot Mountain Comprehensive Pedestrian Plan

Driveway crossings on wider pedestrian corridors should be designed to include level landings along the back (away from roadway) portion of the sidewalk (see image to right).



Pedestrian Buffer

Ideally, pedestrians on sidewalks or side paths will be separated from adjacent roadways and vehicles by a (vegetated) pedestrian buffer. This buffer is essentially located between the curb (along curb & gutter cross sections) and the sidewalk. Along roads with ditch cross sections, a buffer is typically built-in to the design as the pedestrian facility is located behind the back slope of the ditch.



The buffer is intended to provide a physical barrier between pedestrians and the roadway, but also presents a space to house utilities such as traffic poles and fire hydrants, and pedestrian amenities, such as benches, shade trees, mailboxes, and bus shelters. In cases where amenities or utilities are present, they should be located in the buffer, such that the adjacent sidewalk or path is free of obstacles.



To provide a sufficient buffer for pedestrians, the minimum recommended width is 24". Many cities with on-street parking allocate a minimum of 36" to the buffer to separate objects from the curb face and to allow car doors to open and people to exit from the vehicle without obstructing the sidewalk.

Areas which see significant accumulations of snow during the winter will require a wider pedestrian buffer. A minimum width of 72" is recommended for areas where significant amounts of snow will be plowed into the buffer. This additional width is intended to keep the adjacent sidewalk free of snow and debris.



Curb Extensions

Curb extensions, commonly referred to as “bulb-outs” are another important tool for pedestrian crossings (see images above, right). Curb extensions are primarily a traffic calming feature used in conjunction with crosswalk markings and parking lanes, and are designed to narrow the street width at crossing locations. The extension serves to bring pedestrians directly into drivers’ field of vision, and vice versa. It also reduces the crossing distance and time needed for pedestrians to cross.

The decision to utilize curb extensions will depend not only on the desire to shorten pedestrian crossing distances, but also on the traffic patterns, and particularly the presence of *turning* truck traffic. Because of their longer wheel base, trucks require a greater turning radius and curb extensions severely impact their ability to complete tighter turns. In the process of turning, a trucks wheelbase can also encroach on the curb extension or pedestrian area creating a significant hazard.

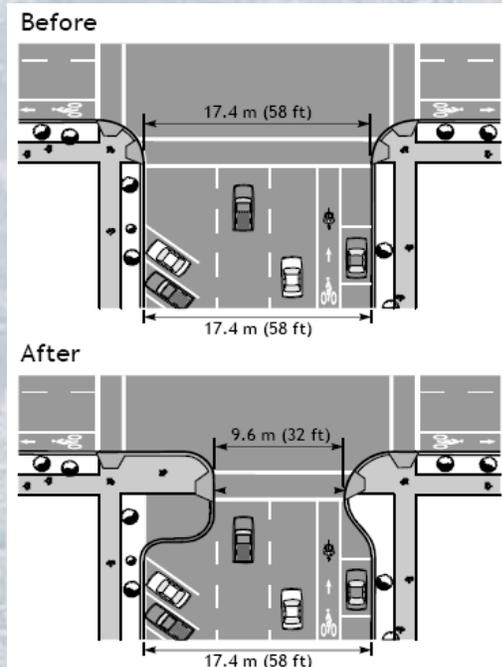


Image courtesy of www.fhwa.gov



Curb Extension; Bainbridge Island, WA.

Photo courtesy of Carl Sundstrom. www.pedbikeimages.org

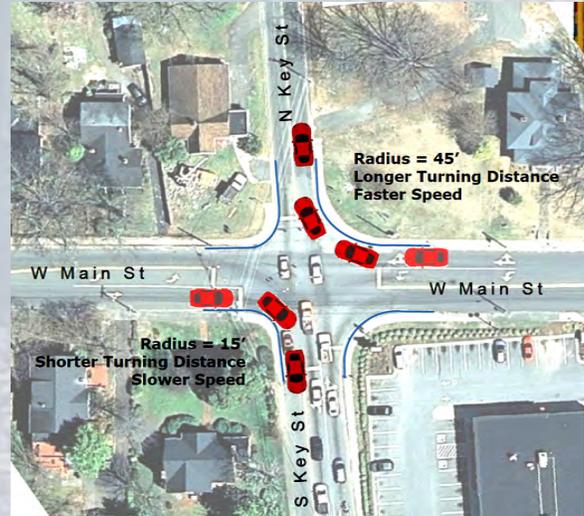


Curb Radii

Similarly to curb extensions, minimizing curb radii at intersections can have a significant impact on vehicle traffic, vehicle speeds, and pedestrian safety (see image below).

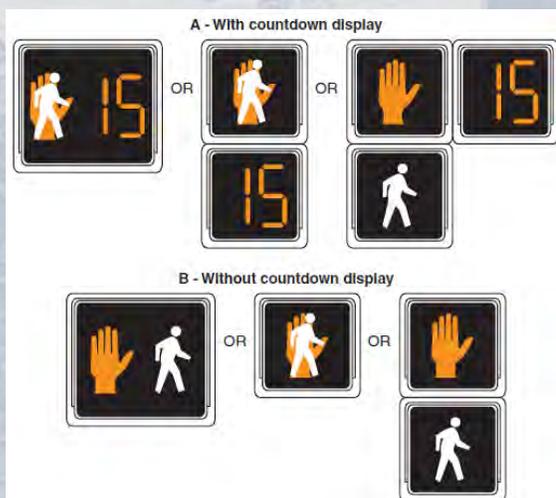
Minimal curb radii effectively:

- Minimize the distance pedestrians need to cross;
- Reduce the speed of turning vehicle traffic;
- Allow for better alignment of the crosswalk with the connecting sidewalks;
- Improve spacing at the corner for proper placement of curb ramps; and
- Improve sight distances (visibility) for drivers and pedestrians



Pedestrian Crossing Signals

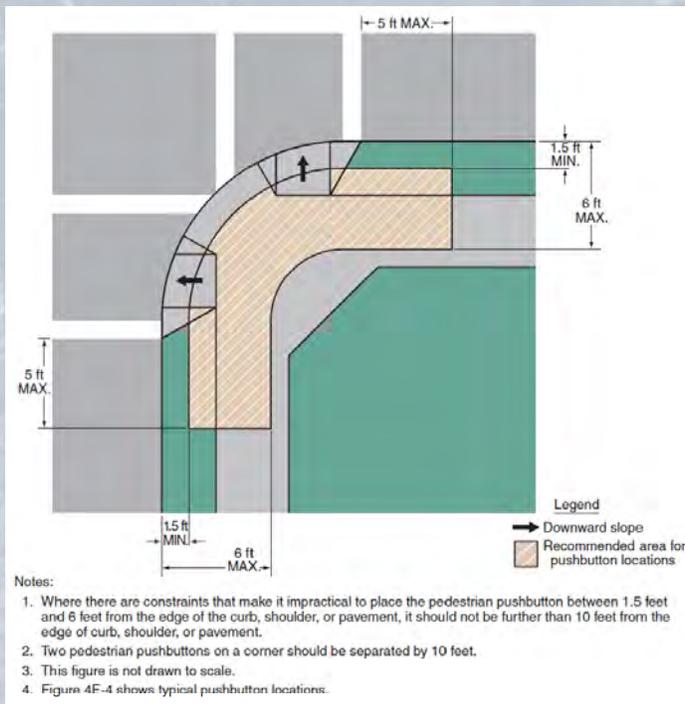
Pedestrian Signal Heads are an essential feature at intersections identified for inclusion in pedestrian networks. Some pedestrian-focused intersections are located on narrow, low-traffic-volume roads which lend themselves toward a more residential character. Others are located on major arterial roads with higher vehicle speeds and high traffic volumes. On these larger facilities, and others, travelers rely on these pedestrian-actuated signals to inform them when traffic has stopped and sufficient time is available for them to cross the street. In addition to visual information and cues, modern pedestrian signals are also equipped with auditory signals which inform visually impaired users when to cross and how much time is available for their crossing. Pedestrian signal heads are installed only in combination with vehicle traffic signals.



Pedestrian Signal Head Indications



Pushbutton Location Area



Manual on Uniform Traffic Control Devices 2009

Pedestrian signal heads are installed such that the base of the unit is between 7' and 10' above the sidewalk. Pedestrian signal head indications are typically available with or without countdown displays (see *Pedestrian Signal Head Indications* above). Where the pedestrian change interval is longer than 7 seconds, a countdown display should be utilized. The countdown display is the standard for use by NCDOT.

Rectangular Rapid Flashing Beacons

Rectangular Rapid Flashing Beacons (RRFBs) are a relatively new and innovative treatment for enhancing safety and awareness at road crossings. RRFBs are solar-powered, user-actuated (similar to existing pedestrian crossing signals) amber LED lights which are used as to supplement approved pedestrian and school crossing signs. The RRFB employs an irregular flash pattern similar to flashers on emergency vehicles. The approved flash pattern was revised by FHWA in June of 2012 to maximize effectiveness.



*Rectangular Rapid Flashing Beacon, St. Petersburg, FL
Photo courtesy of Michael Frederick. www.pedbikeimages.org*

RRFBs are an ideal tool for Pilot Mountain in that they are a low-cost alternative to both traffic signals and hybrid crossing signals (HAWKS - <http://mutcd.fhwa.dot.gov/htm/2009/part4/part4f.htm>), and require lessened vehicular and pedestrian traffic warrants. Jurisdictions wishing to install RRFBs must have approval from the FHWA Office of Transportation Operations, and must comply with general operation requirements. FHWA guidance on RRFBs can be found here: <http://safety.fhwa.dot.gov/intersection/resources/techsum/fhwasa09009/>

Pedestrian Refuges

A pedestrian refuge is a human-scale type of traffic island, typically located within a raised median, or at the midway point of a multi-lane road crossing. Refuges allow pedestrians and bicyclists to focus attention on one direction of traffic at a time, enabling them to stop partway across the street and wait for an adequate gap in traffic before continuing to cross.



*Pedestrian Refuge, Bellevue, WA.
Photo courtesy of Dan Burden www.pedbikeimages.org*



Refuges serve not only as a safety treatment for users, but offer a visual cue to drivers to slow down for potential pedestrian crossings. Refuges should be used in conjunction with striped crosswalks, and are typically housed in a concrete form to shield users from vehicles. They can be landscaped, brick, or concrete with varied lengths and widths to fit the particular crossing. Roadway crossings greater than 60' should employ refuges, ideally in conjunction with curb extensions.

Railroad Crossings

Pedestrian railroad crossings can be hazardous to users, due not only to the potential conflict with trains or light rail, but due to the tripping hazard and mobility obstacles presented by flangeways. Flangeways typically have a gap of 2" which is greater than the maximum 0.5" gap recommended for wheeled trail users (bicycles, wheelchairs, etc). It is always recommended that pedestrian or trail facilities intersect railroads at as close to a perpendicular angle as possible in order to minimize the hazards posed by the flangeway and limit the crossing distance of the railroad itself.



Yadkin Valley Railroad crossing,
Pilot Mountain Wastewater Facility

The following design guidelines are recommended for railroad crossings:

- Approaches to the track and the area between the tracks should be raised to the level of the top of the rail to eliminate tripping and gap hazards. A surface material that will not buckle, expand, or contract significantly (textured rubber railroad crossing pads) are available for low-speed light rail facilities only and should be used where feasible;
- Approaches to the track should be ramped with minimal grades and should be flat for a distance of 5 feet on either side of the tracks and have a firm and stable surface;
- For recreation trails, the trail surface should be hardened to reduce the debris that scatters over the tracks as users pass;

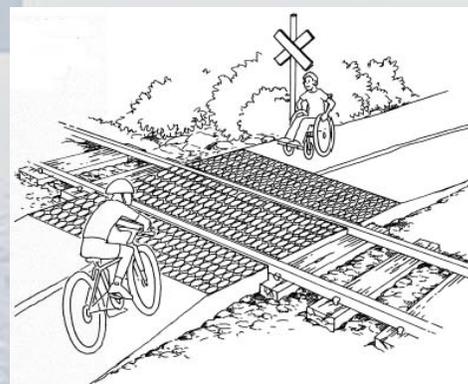
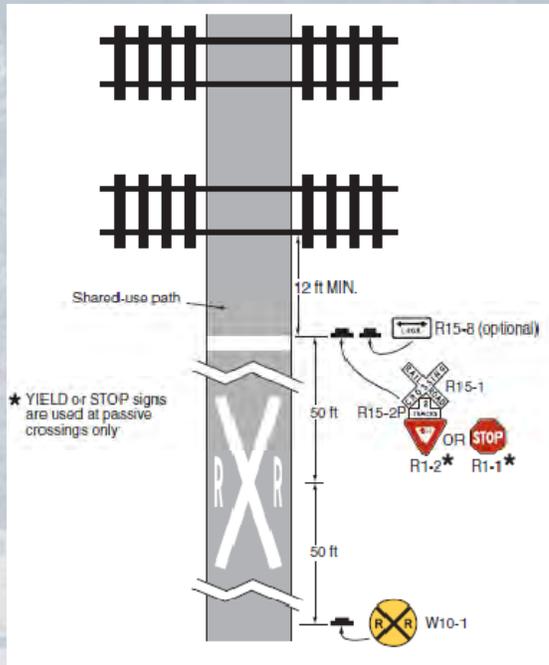


Image courtesy of www.fhwa.dot.gov



- Sight lines and signage should ensure that all users, and particularly those with disabilities affecting hearing, vision, or mobility impairments, have adequate warning about the intersection; and
- Signals and/or gates should be considered to warn trail users of the rail crossing

With regard to signage, pedestrian railroad crossings are similar to roadway crossings in that they require appropriate signage and, in some cases, advance warning/signage.



Manual on Uniform Traffic Control Devices 2009

Signage

Signage is an essential component of an effective pedestrian network. Signs are commonly used for wayfinding along greenway and trail corridors which are separated from recognizable road networks. Regulatory and warning signs are also important to ensuring safety and providing information to pedestrians, bicyclists, and motor vehicle operators.

Informational & Warning Signs

The following informational signs are designed to provide direction for pedestrians and approved for use in the 2009 Manual on Uniform Traffic Control Devices (<http://mutcd.fhwa.dot.gov>). These signs are typically located along sidewalks and other facilities in more urban environments, and meant to limit conflicts with other transportation modes.



Pedestrian Crossing Signs



Combined Bicycle/Pedestrian Warning Signs

* A fluorescent yellow-green background color may be used for this sign or plaque. The background color of the plaque should match the color of the warning sign that it supplements.

Wayfinding Signs

Wayfinding signs are used all pedestrian environments, but are commonly used in locations away from existing road networks. These signs are generally designed to a similar standard for the respective trail or pedestrian facility – often the managing agency will develop a unique color pallet and design in order to distinguish the pedestrian network.

Wayfinding signs are used to disseminate information, provide directions to destinations, and designate pedestrian facilities and amenities. These signs can be as complex as trailheads with extensive graphics and information, or as simple as basic monuments and markers (see below). Placement of pedestrian wayfinding signage is recommended at intervals of ½ mile or less.



Four Mile Creek Greenway, Matthews, NC



Anne Springs Close Greenway, Fort Mill, SC



Carolina Thread Trail, Fort Mill, SC

Pedestrian Lighting

Pedestrian lighting is intended to enhance visibility, particularly during nighttime or low-visibility events, such that users can see comfortably and can correctly identify objects, faces, and hazards along pedestrian routes. Illuminating walkways not only makes it easier for pedestrians to navigate, but it can also signal to pedestrians which routes are considered to be ideal or most direct for pedestrian travel. This approach to lighting would be especially important along Pilot Mountain's E. Main St where the land use supports more significant pedestrian traffic.

Because pedestrian lighting is typically mounted on poles, lighting can be used to distinguish unique neighborhoods and areas through creative pole or lantern design.



Pedestrian Lighting. Charlotte, NC
Photo courtesy of Dan Burden
www.pedbikeimages.org



Pilot Mountain Comprehensive Pedestrian Plan

Appropriately designed pedestrian lighting enhances the pedestrian experience, while increasing safety and encouraging pedestrian traffic.

Pedestrian lighting is intended to illuminate the pedestrian walkway in particular, and should be mounted 12' – 16' above the sidewalk or trail. The individual lights and/or poles should be spaced approximately 75' apart along the pedestrian walkway.

Roundabouts

Roundabouts are an alternative type of intersection characterized by a circular shape, yield control on entry, and geometric features that create a low-speed environment. Modern roundabouts have been demonstrated to provide a number of safety, operational, and other benefits primarily due to the reduced vehicle speed and reduced number of conflict points they create. When enhanced with appropriate facilities and safety features, roundabouts offer increased safety for pedestrians, in comparison to standard intersections.



Photo courtesy of Connecticut Department of Transportation.

Pedestrian Benefits



Operational Performance: When appropriately designed for traffic volumes, roundabouts typically have lower overall delay than signalized and all-way stop-controlled intersections. This delay reduction often results in reduced lane requirements between intersections. When used at the terminals of freeway interchanges, roundabouts can often reduce lane requirements for bridges over or under the freeway, potentially allowing additional width for pedestrian facilities.

Access Management: Because roundabouts essentially provide U-turn vehicle movements, they can reduce or eliminate vehicle turning movements (primarily left turns) at driveways between major intersections.

Traffic Calming: Roundabouts can have a traffic calming effect on streets by reducing vehicle speeds using geometric design, rather than relying on traffic control devices.



Pedestrian Crossings: Due to the reduction of vehicle speeds in and around the intersection, roundabouts can improve safety with pedestrian crossing opportunities. Additionally, the splitter island refuge area provides pedestrians with the opportunity to focus on one direction of traffic at a time. It should be noted that pedestrians with visual impairments may not receive the same level of information at a roundabout as at a typical signalized intersection, and they may require additional treatments such as basic and auditory pedestrian signalization.

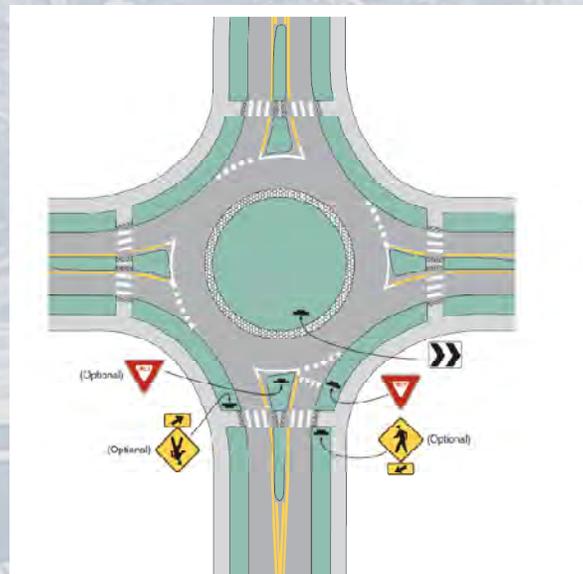
Aesthetics: The central island and splitter islands offer the opportunity to provide attractive human-scale landscaping, monuments, and art, provided that they are appropriate for the traffic conditions.

Approach Roadway Width: A roundabout may reduce the amount of widening needed on the approach roadways in comparison to alternative intersection forms. While signalized or stop-controlled intersections can require adding lengthy left-turn and/or right-turn lanes, a single-lane roundabout allows for a narrower cross section in advance of the intersection. This creates a shorter roadway crossing for pedestrians.

Pedestrian and Bicycle Facilities

Sidewalks, crosswalks, and similar pedestrian facilities are typically accommodated around the perimeter of the roundabout. Splitter islands allow pedestrians to focus on one direction of traffic at a time, similar to a typical pedestrian refuge.

Bicyclists should have similar options to negotiate roundabouts as they have at conventional intersections, where they navigate either as motor vehicles or pedestrians depending on the size of the intersection, traffic volumes, their experience level, and other factors. Single-lane roundabouts in low-volume areas typically allow bicyclists to ride through comfortably in the travel lane. At larger or busier roundabouts, cyclists may be safer using ramps connecting to a sidewalk or multiuse path around the perimeter of the roundabout, similar to a pedestrian.



Manual on Uniform Traffic Control Devices 2009

Pedestrian Design Treatments

Whenever feasible, sidewalks at roundabouts should be set back from the edge of the circulatory roadway by a landscaped buffer. The buffer discourages pedestrians from crossing to the central island or cutting across the circulatory roadway of the roundabout, and it helps guide pedestrians with vision impairments to the designated crosswalks. A buffer width of 5' (minimum 2') or greater is recommended with low shrubs or grass in the area between the sidewalk and curb to maintain sight distance needs (see below).



Pilot Mountain Comprehensive Pedestrian Plan

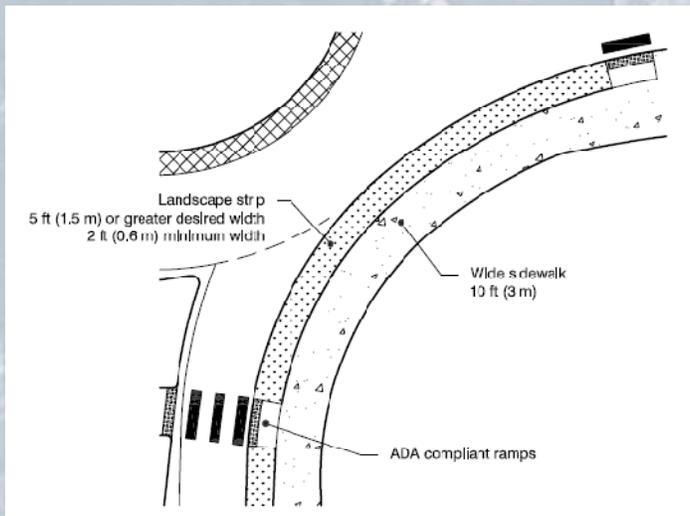


Image courtesy of www.fhwa.dot.gov

Crosswalks should be located at least one vehicle-length away from edge of the circulatory roadway. A minimum crosswalk setback of 20' is recommended. The raised splitter island width should be a minimum of 6' at the crosswalk to adequately provide shelter for persons pushing a stroller or walking a bicycle. At larger or more trafficked roundabouts, it may be appropriate to place the crosswalk two or three car lengths (45' to 70') back from the edge of the circulatory roadway. This longer setback is typically used in situations with relatively high volumes of pedestrian crossings that may result in long queues on the exit roadway extending into the circulatory roadway.



Appendix 2:

Project Cost Estimates



Pilot Mountain Comprehensive Pedestrian Plan

Project	Primary Facility Type	Multi-Use Trail		Sidewalk		Multi-Use Sidewalk		Cresswalk Stripping, Signage, Curb Ramps		Refuge Islands		Pedestrian Signal Heads		RRFB		Railroad Crossing Stream Crossings		Pedestrian Culvert		Total Cost (+8% Contingency)		
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
1 Main St Neighborhood Crosswalks	N/A																				\$5,292	\$30,240
2 Dodson St	Proposed Sidewalk			\$10,070	\$18,050																\$10,876	\$19,494
3 Black Mountain Rd	Proposed Multi-Use Sidewalk					\$576,870	\$906,510														\$623,020	\$979,031
4 Butler St	Proposed Sidewalk			\$1,908	\$3,420			\$500	\$5,000												\$2,601	\$9,094
5 Dodson Mill Rd	Proposed Sidewalk			\$358,188	\$659,820			\$9,600	\$12,000												\$386,843	\$712,606
6 Shellybrook - 52 Bypass Connector	Proposed Multi-Use Trail	\$40,400	\$63,128																		\$43,632	\$68,175
7 East - West Marion St	Proposed Sidewalk			\$120,787	\$216,505			\$11,200	\$49,000												\$142,546	\$286,745
8 East - West Pine St	Proposed Sidewalk			\$186,189	\$333,735			\$7,000	\$70,000												\$208,644	\$436,034
9 Elementary School Connector	Proposed Multi-Use Trail	\$42,320	\$66,128																		\$45,706	\$71,415
10 Foothill Dr	Proposed Sidewalk			\$55,438	\$99,370																\$59,873	\$107,320
11 Friends St	Proposed Sidewalk			\$36,835	\$66,025			\$11,600	\$32,000												\$52,310	\$105,867
12 Golf Course Rd	Proposed Sidewalk			\$46,852	\$83,980																\$50,600	\$90,698
13 Main St West	Proposed Sidewalk			\$375,360	\$688,160			\$12,100	\$37,000					\$15,000	\$15,000						\$477,857	\$881,453
14 Hwy 52 Bypass East	Proposed Sidewalk			\$442,215	\$835,295			\$2,500	\$25,000												\$512,692	\$990,679
15 Hwy 52 Bypass West	Proposed Sidewalk			\$501,930	\$948,090			\$2,000	\$20,000					\$15,000	\$15,000						\$560,444	\$1,061,737
16 Leonard Rd	Proposed Multi-Use Sidewalk					\$63,000	\$99,000														\$68,040	\$106,920
17 Lola Ln	Proposed Sidewalk			\$79,712	\$142,880			\$8,700	\$24,000							\$1,000	\$5,000				\$95,485	\$180,230
18 Lynchburg - Key Connector	Proposed Multi-Use Trail	\$202,960	\$317,128																		\$220,277	\$347,895
19 Lynchburg Rd	Proposed Sidewalk			\$239,020	\$440,300			\$2,000	\$20,000												\$260,302	\$497,124
20 Main Street - 52 Connector	Proposed Multi-Use Trail	\$43,840	\$68,500																		\$47,347	\$73,980
21 Medical St	Proposed Sidewalk			\$32,171	\$57,665																\$34,745	\$62,278
22 N Academy St	Proposed Sidewalk			\$156,562	\$280,630																\$169,087	\$303,080
23 N Depot St	Proposed Sidewalk			\$141,987	\$254,505																\$196,546	\$356,945
24 N Key St	Proposed Sidewalk			\$158,152	\$283,480			\$11,600	\$32,000												\$183,332	\$340,718
25 NC 268	Proposed Sidewalk			\$83,025	\$156,825																\$111,267	\$210,411
26 Old Westfield - Bypass Connector	Proposed Multi-Use Trail	\$29,360	\$45,875																		\$31,709	\$49,545
27 Old Westfield Rd	Proposed Sidewalk			\$326,496	\$601,440			\$2,000	\$20,000					\$15,000	\$15,000						\$370,976	\$687,355
28 Main St Downtown	Proposed Sidewalk			\$129,060	\$236,610			\$1,000	\$10,000												\$140,469	\$266,343
29 S Academy St	Proposed Sidewalk			\$111,651	\$173,865			\$4,500	\$45,000												\$493,723	\$932,974
30 S Boyle St	Proposed Sidewalk			\$159,296	\$293,440																\$172,040	\$316,915



Pilot Mountain Comprehensive Pedestrian Plan

Project	Primary Facility Type	Multi-Use Trail		Sidewalk		Multi-Use Sidewalk		Crosswalk Striping, Signage, Curb Ramps		Refuge Islands		Pedestrian Signal Heads		RRFB		Railroad Crossing Stream Crossings		Pedestrian Culvert		Total Cost (+8% Contingency)	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
31 S Davis St	Proposed Sidewalk			\$66,038	\$118,370															\$71,321	\$127,840
32 Old Winston Rd	Proposed Multi-Use Sidewalk			\$159,636	\$286,140	\$230,090	\$361,570	\$17,000	\$65,000											\$249,577	\$395,896
33 S Key St - Railroad North	Proposed Sidewalk			\$262,530	\$495,890	\$10,360	\$16,280	\$2,000	\$20,000											\$692,967	\$1,075,831
34 S Key St - Railroad South	Proposed Sidewalk			\$304,167	\$545,205			\$5,800	\$16,000											\$512,881	\$871,744
35 Carson St Crosswalk	N/A																			\$6,264	\$17,280
36 School St	Proposed Multi-Use Sidewalk					\$202,510	\$318,230	\$1,000	\$10,000											\$328,500	\$588,821
37 Stone Haven Dr	Proposed Sidewalk																			\$219,791	\$354,488
38 Swanson St	Proposed Sidewalk																			N/A	N/A
39 US Highway 52 Interchange	Proposed Sidewalk			\$67,108	\$123,620			\$1,000	\$10,000											\$105,957	\$230,710
40 Main Street - Key Street Pedestrian Signal	N/A							\$2,000	\$20,000				\$40,000	\$76,000						\$45,360	\$103,680
41 Pilot Creek Greenway - Phase I	Proposed Multi-Use Trail					\$455,760	\$712,125													\$686,621	\$1,001,295
42 Pilot Creek Greenway - Phase II	Proposed Multi-Use Trail					\$359,760	\$562,125	\$500	\$5,000											\$4,100	\$4,700
43 Pilot Creek Greenway - Phase III	Proposed Multi-Use Trail					\$122,960	\$192,125	\$500	\$5,000											\$100,000	\$115,000
																				\$350,000	\$400,000
																				\$619,337	\$769,095