Section 4: GENERAL RECOMMENDATIONS

4.1 Overview of the Existing System

KEY ISSUES IN THE BICYCLE COMMUNITY

GENERAL DESCRIPTION
The current bicycle system in and around Kings Mountain consists primarily of the existing roadways, and the off-road multi-use path Gateway Trail facility. The Bicycle Facilities map (Section 7, Map 4) indicates where additional improvements exist that are specifically designed and intended for bicycle use. These facilities are limited to “Share the Road” signage along the York Road south of I-85, and paved shoulders with “Share the Road” signage along York Road from Lake Montonia Road south to the ETJ limit. Another continuous stretch of paved shoulders with accompanying signage runs along Stony Point Road/Shelby Road and the recently constructed Kings Mountain Boulevard. The relative suitability of all streets and roads in Kings Mountain in terms of safety are indicated in the Bicycle Suitability Analysis map (Section 7, Map 11).

Recommendations:
As road improvements are scheduled, refer to the Proposed Projects List in Section 6 and the Proposed Routes & Facilities Map in Section 7 to incorporate recommended improvements in those projects.

CONNECTIVITY
There are roughly three gridded neighborhoods demonstrating high degrees of connectivity within Kings Mountain. The downtown grid extends from Oriental Ave. (on the east side) to Phifer Road, and from Parker Street south to Gold Street. The Linwood neighborhood north of US 74 Bypass extends roughly from Boyce Street westward to Grace Street, and Groves Street southward to Henry Street. And the Fulton Road Area runs from Margrace Road to Phifer Road, and from Manor Road to Pinehurst Drive. Other areas of moderate connectivity exist within the City, primarily to the north and south of the West End district, and north of US 74 Bypass between Cleveland Avenue and Cansler Street. All of these areas offer some degree of refuge to bicyclists, allowing them to traverse portions of the City while avoiding more highly travelled roads. Additional description can be found in Section 2: Road System.

Recommendations:
The potential for increased connectivity between and within these neighborhoods should be explored, both in terms of increased street connections, and off-road trail opportunities. Where many existing streets terminate due to topographic challenges such as stream valleys, the potential exists for off-road connections to follow these floodways or cross them at strategic locations.
BARRIERS
While the barriers enumerated in Section 3 of this plan pose challenges to bicyclists navigating Kings Mountain, there are opportunities to improve existing ways of passage over, under, or around them. Opportunities to improve existing connections or create new ones across these most pervasive barriers should be maximized. This includes improving existing overpass and underpass facilities along I-85 and US 74 Bypass, at grade and overpass crossings of the Norfolk Southern Railway, and at grade crossings of Shelby Road at prominent intersections. This plan also recommends utilizing existing infrastructure to develop a new below grade crossing of US 74 Bypass, and a refurbished above grade crossing of I-85. For details, see Section 5.7 and 6.1.

In addition to these primary barriers, other barriers are addressed in the local street system.

In order to estimate the relative significance of the various barriers in the current system, a number of variables can be factored in: destinations or populations affected, cost of facilities needed, public requests for the facility, etc. However, to evaluate the barriers purely in terms of the logistical impediment they pose, a few measureable factors should be considered. One such factor is the distance required to travel (by bicycle) between two points: the “travel distance” (or Td), compared to the actual distance (Ad) between those points; in other words, how far one has to go out of their way to get from point “A” to point “B”, versus the distance “as the crow flies.” This degree of impediment, or “barrier deflection” (BD) can be calculated as:

\[ BD = Td - Ad \]

The higher the value of BD, the more the traveler is deflected from a straight course as they try to reach one point from the other. When there is no barrier to overcome, Td and Ad are the same and the BD value = 0.
Two significant barriers within the Kings Mountain local road system are identified here for comparison. Barrier 1 is located in the Country Club area between Edgemont Drive & Downing Court. Barrier 2 is located in the Margrace and West End neighborhoods, between Huntingtowne Drive and Wintergreen Court. Both barriers are located in residential neighborhoods. Both barriers have topographical challenges. In order to compare these two barriers in terms of their physical affect on the system, the deflection value can be measured for each.

In the case of Barrier 1, for a resident of Edgemont Drive to bicycle to an address on Downing Court, they must leave the local neighborhood street network and utilize US 74 Business, a minor arterial road with a 35 mph speed limit that sees traffic volumes in excess of 10,000 vehicles per day. The actual distance (Ad) between the ends of the two roads at Barrier 1 is approximately 250 feet. The total travel distance (Td) required in order to reach one side of the barrier from the other, utilizing US 74 for a minimum distance, equals 9,770 feet. The deflection of Barrier 1 is therefore calculated as:

$$BD1 = Td - Ad = 9770' - 250' = 9520' \text{ or } 1.80 \text{ miles}$$

In other words, Barrier 1 can require a bicyclist to travel as much as 1.8 miles out of their way on an alternative route to reach their destination, and be forced to utilize a segment of road with significant traffic.

In the case of Barrier 2, the actual distance of the interruption due to the barrier is similar, about 260 feet. But the shortest available route between one end point and the other is 12,130 feet (2.3 miles)!

$$BD2 = Td - Ad = 12,130' - 260' = 11,870' \text{ or } 2.25 \text{ miles}$$

A comparison of the two deflections caused by these barriers shows that, while both are substantial, Barrier 2 imposes a greater burden on the traveler, requiring them again to utilize a minor arterial road (Phifer Street) for part of their journey. Limited to this consideration alone, construction of a bridge facility for bicycle and pedestrian use over Barrier 2 would provide more “bang for the buck” than a similar facility for Barrier 1.
The area and population most significantly affected by the barrier can also be evaluated. This area is approximated by identifying the edge formed by the surrounding streets of higher road classification. The edge is defined in this manner because:

a. It will likely conform to the recognizable edge of the neighborhood;
b. It will likely offer the least complex and quickest alternative route back into the neighborhood.
c. These streets are not likely to be crossed by the bicyclist to reach the destination due to their higher vehicular speeds and volume.

In addition to the higher classified streets, other natural and man-made barriers may also help define the affected area, or “barrier zone” (BZ); in such cases, parcel lines can provide the actual boundary. Once this zone is defined, it can be easily measured. However, this measurement alone does not reveal the negative value of the barrier in terms of the potential number of users affected.

In order to better account for the volume of potential usage in the affected zone, an approximation can be made based upon the number of residential parcels or multi-family dwelling units within that zone. Major destinations in the proximity will also add to the significance of the barrier; however, the majority of affected users may be limited to residents from within the other side of the affected zone, as those travelling from outside of the zone will more likely utilize the higher classified streets. In general, the higher the number of affected residents, the more significant the barrier is to the system, and the more useful a bridging of that barrier would be. Note: a cursory visual examination of the density of parcels can quickly reveal the relative significance of these barriers. The density of the street pattern may also provide a quick evaluation tool for approximating this value.

Once the number of dwelling units or parcels within the barrier zones has been counted, the “barrier population” (BP) of various barriers can be determined. How these populations are affected by each barrier, and to what degree, can be calculated by combining the values of barrier deflection, barrier zone and barrier population. This overall “barrier value” (BV) is derived using:

\[ BV = BP \times BD^3 / BZ \]

This formula accounts for a number of factors involved in considering the detrimental effect (or negative value) of a barrier:

- The barrier value (BV) is directly related to the number of residents affected (BP) and additional travel length (or deflection) necessitated by the barrier (BD).
- As the barrier zone (BZ) increases, there are more residents in the zone that are less affected by it, or will need to travel a decreasing portion of it.
- As connectivity of the affected area increases, more choices of path are available and the barrier deflection decreases, though the barrier area may still be large.
- As fewer people reside near the barrier, the impact or negative value of the barrier decreases.
If the barrier deflection is expressed in mile units, the barrier zone is in square miles, and the resulting barrier value is expressed in a conceptual term “user-miles”. The number of user-miles indicates that a given number of people are being forced to travel various distances out of their way.

Applying the formula to the barriers identified above:

\[
BV_1 = BP_1 \cdot BD_1^3 / BZ_1 = 625 \cdot (1.80 \text{ mi.})^3 / 0.9217 \text{ sq. mi.} \\
= 625 \cdot 5.832 \text{ mi}^3 / 0.9217 \text{ sq. mi.} \\
= 3,955 \text{ user-miles}
\]

\[
BV_2 = BP_2 \cdot BD_2^3 / BZ_2 = 935 \cdot (2.25 \text{ mi.})^3 / 0.9079 \text{ sq. mi.} \\
= 935 \cdot 11.39 \text{ mi}^3 / 0.9079 \text{ sq. mi.} \\
= 11,730 \text{ user-miles}
\]

Though the areas affected by each barrier (BZ) are nearly equal, the Barrier 2 zone has a greater residential density, and the barrier itself creates a greater deflection in the travel path. Its barrier value (BV) is nearly three times as high as that of Barrier 1. This indicates that bridging Barrier 2 would bring more benefit to more people than bridging Barrier 1, whether they choose to walk or bike. And while the Barrier 1 zone includes some prominent destinations and the Barrier 2 zone does not, the majority of residents outside Barrier 1 zone can access those destinations more directly from paths that do not encounter the barrier and would therefore not significantly benefit from a bridging of that barrier.

**Recommendations:**
Provide bicycle and pedestrian connections across identified barriers. These projects are identified in Section 6.1 as X-1 through X-6 in the Proposed Projects List and the Proposed Routes & Facilities Map.

**GENERAL SAFETY CONDITIONS**

Many factors directly influence the safety of bicycling conditions in the City and its surroundings. Reported crashes provide one clue to where conditions may be less than optimal, but these isolated instances do not directly reveal the various physical elements that detract from a safe bicycling environment.

**High crash areas**
The occurrence and severity of reported crashes involving bicycles from 1990 through 2010 are depicted on the Traffic Conditions Map (Section 7, Map 10). The pattern of reported crashes is not significantly clustered at any particular intersection, but it does indicate certain corridors that are higher-risk for cyclists. These corridors include:

- **NC 216** – one fatality and one possible injury between downtown and the Gateway Trail Head
- **Phifer Road** – one possible injury and one property damage (likely a damaged bicycle) between the schools and the Margrace Neighborhood.
• **Gold Street** – one evident injury and one property damage within one block on either side of NC 161, and one disabling accident at Sims Street.

Other evident injuries have occurred as a result of bicycle crashes in the City, including one on NC 161 at the Montonia intersection, and another just off NC 161 on Benfield Road near North Elementary School. Additional possible bicycling injuries have occurred on 2nd Street, Sims Street, and Margrace Road. Mountain Street has also seen bicycle damage.

**Highway Crossings**

The various highway crossings that allow access into the City across US 74 and I-85 have been constructed over various years with various design standards. The newer overpasses feature barriers that reach a height sufficient to prevent cyclists from accidentally falling off the bridge structure. These newer facilities include the N. Piedmont and Stony Point overpasses over US 74, along with the NC 161 and Dixon School Road overpass over I-85.

A number of older bridges, however, feature rails that are shorter and may present a hazard to cyclists. These overpasses include:

- Oak Grove over US 74
- Patterson over US 74
- Canterbury over I-85

**Recommendations:**

The Patterson and Canterbury Road overpasses are integral to recommended bike routes in this plan. Oak Grove is not. Recommendations for overpass rail treatment are located in Section 6: Facility Standards.

Along with the rail improvements noted above, other improvements are needed to enable additional safe crossing opportunities for I-85 and US 74. These include utilizing the storm drainage structure under US 74 Bypass just east of the US 74 Business intersection, and the existing “Gateway Bridge” over I-85. Recommendations for these projects are located in Section 6: Facility Standards.
Railroad Crossings
The Norfolk Southern Railway is a dominant feature running the length of Kings Mountain. As most crossing opportunities are at-grade, the railway presents a substantial safety hazard for bicycle traffic. There are only two above-grade crossings within the City, and only two more within its ETJ.

Downtown Hazards
Additional hazards particularly in the downtown area that affect bicycling conditions, as noted by citizens of Kings Mountain include:

- Street Lighting
- Traffic volumes and speeds
- Narrow older streets
- On-street parking
- Blind corners
4.2 Corridor Recommendations
CONNECTING THE BICYCLE COMMUNITY

A number of corridors throughout the City currently or could potentially serve as important routes for bicycle users. Though lesser routes through connected neighborhood streets can provide safe, low-traffic alternatives through some parts of town, these primary and secondary corridors provide the main connections through the City, and will be favored particularly by more experienced riders and visitors. Though each of the corridors described here currently provide some degree of refuge and utility for bicyclists, each could be improved to serve as safe, useful and attractive bicycle routes. A map of the proposed corridors is located in Section 7: System Maps. Refer to Section 3.1 for descriptions of the zoning overlay districts, and Section 4.5 for related policy recommendations. Additional physical descriptions for these corridors can be found in Section 2.1. For detailed descriptions of all individual project recommendations, refer to Section 6: Project Recommendations.

Three primary corridors help provide connections to regional destinations:
1. **US 74 Business** - Kings to Shelby Road to Stony Point Road (E to W) Connection to Gastonia & Moss Lake
2. **NC 161** – Bessemer City Road to Cleveland Ave. to York Rd. (N to S) Connection to Bessemer City & Kings Mountain State Park
3. **NC 216** – N. Piedmont to S. Battleground. (NW to SW) Connection to Cherryville & Kings Mountain Military Park

Four secondary corridors help connect destinations both inside and outside the City limits:
4. **School & Town Route** - Gold to Mountain to Phifer (E to SW) Connection to downtown & schools
5. **Phenix Mill/Northwood** - Linwood Road to N. Piedmont to Lackey to Bridges (E to W) Connection from Ike Brooks Road to Cansler Street
6. **The Boulevard** - Kings Mountain Boulevard to Shelby Road
7. **The Lake Connector** - Stony Point Stony Point Road to Oak Grove Road

Each of these corridors are described and evaluated in the following terms:
- Destinations they primarily serve
- Land use and transportation policies and ordinances that directly affect their use
- Existing physical conditions and the types of facilities they offer bicyclists
- Links these corridors provide to other corridors and proposed routes
- Highway projects that are currently scheduled for each corridor
- Specific project recommendations for improving these corridors
- Potential alternative routes appropriate for safe bicycle travel

Within the following corridor descriptions, certain low-volume alternative routes are suggested for improvements appropriate for “bicycle boulevards”. For more information on these strategies, see: http://www.bicyclinginfo.org/faqs/answer.cfm?id=3976.
US 74 Business Corridor

The US 74 Business Route is the primary east-west connection through Kings Mountain. As a result of the construction of the US 74 Bypass, US 74 Business begins at the eastern urbanized end of the City, at Canterbury Road, near the Gaston County line. It runs through the middle of the City, and rejoins US 74 Bypass at a point just west of the City limit but within its ETJ. US 74 Business includes Kings Street until King merges with the Mountain Street alignment to become Shelby Road, and terminates at US 74 Bypass. The total distance it traverses is approximately five miles.

Destinations & Land Use:
The King Street segment features the greatest density of destination points along the street for this corridor. Amongst the many small businesses that line King Street in the Central Business District, east of the railway, are located civic destinations such as the William Mauney historic home, the Mauney Library, the McGill Filling Station, Mountain Rest Cemetery, and the Patrick Senior Center. Many other downtown destinations lie within only a couple of blocks of King Street. As King crosses the railway, residential uses dominate. The hospital complex is located in this area at Juniper Street. Just north of King Street, the Davidson School neighborhood stretches from Cleveland Avenue westward across the railway. The West End neighborhood lies to the south of this portion of King Street.

Past the hospital, King Street bends one block south to become Shelby Road. Both the Kings Mountain Plaza and Westgate Plaza shopping centers are located on Shelby, along with a number of dining spots and other small businesses interspersed with residential properties and subdivisions. The Country Club neighborhood lies just north of the eastern portion of Shelby Road. To the west, just before US 74 Bypass, Ingles Market is located within an area that is largely industrial.

Existing policy:
In addition to zoning and other land use regulations governing all properties in the City and its Extraterritorial Jurisdiction (ETJ), the City has enacted a total of eight corridor overlay districts to further guide development. King Street is covered by the US 74 East Corridor Overlay District, with additional coverage by the Downtown District Overlay from east of North Gaston Street to west of Cansler Street. The NC 161 Corridor Overlay also overlaps King Street at its intersection with York Road. The US 74 Business West Overlay stretches from Country Club Road to Country Creek Drive.
**Facility description:**
King Street traverses a highly connected, historic section of downtown, with intersections every 600 feet. East of rail line (and Battleground Road), King is characterized by frequent curb cuts, and numerous signs and utility poles. West of the rail line, the street takes on a greener, more residential character. King Street is three lanes wide for its entire length, with a center turn lane, and curb and (sometimes) gutter. Outside lanes run 11'-12' wide. Sidewalks, with a narrow planter strip along all but its most intensively paved area adjacent to York Road, persist along the south side of the road westward until the hospital between Sims and Juniper Streets, and along the north side until Country Club Road. The posted speed limit is 35 mph. There are no warning signs pertaining to bicycles. Conditions for bicycles are poor due primarily to narrow lane width, heavy traffic, and frequent curb cuts.

Continuing west of Kings Street, Shelby Road possesses a completely different character. Its six lanes are divided by a 12'-24' center grassed median. Lanes are 11 feet wide. This segment is still posted as 35 mph, but conditions encourage speeding. Bicycle safety conditions are poor on Shelby Road from King Street to Kings Boulevard due to narrow lane width, heavy traffic, and travel speeds.

West of Kings Boulevard, posted speeds on Shelby Road jump up to 55 mph, but bicycle safety conditions for mature riders improve with the addition of paved shoulders and bicycle-related signage.

**Connections:**
The US 74 Business Corridor passes through a highly connected street grid on the east side of the City, transitioning to a poorly connected west side. Both the NC 161 and the NC 216 corridors intersect US 74 Business. Phifer Road and Kings Mountain Boulevard minor corridors also connect with it. The King Street segment of this corridor is recommended for inclusion in the Inner and Outer Loops. The Shelby Road segment is recommended for inclusion in the Outer Loop. See **Section 4.4** for additional description of the Inner and Outer Loops.

**Scheduled projects:**
The Cleveland County Comprehensive Transportation Plan calls out a need for bicycle facility improvements of the segment of Shelby Road from El Bethel Road to Countryside Road. There are no other road improvement projects in the current or draft STIP for this corridor.

**Retrofits and alternate routes:**
While US 74 Bypass provides a continuous east-west passage through the City, conditions for bicycle use is primarily poor. However, a number of favorable alternative routes run closely parallel to this corridor.

From Canterbury Road to Battleground Avenue, East and West Ridge Street provide a safe, low volume alternative through the Davidson School neighborhood and is recommended as a bike boulevard. West of Battleground, Mountain Street offers safer conditions through a tree-lined West End Historic District.
neighborhood. West Elementary School and the Joy Performance Center are located along this proposed route. Upon reaching Phifer Road, two alternative east-west routes are proposed.

To the north of Shelby Road, Country Club Road connects Mountain Street to a chain of streets in the Country Club neighborhood. Bike boulevard improvements are recommended for this alternative route in order to provide for a safer bicycle connection to Westgate Plaza. With the addition of a 150’ trail from the Plaza to Washington Street, and a 1,100’ trail from Ware Street to Woodhaven Lane, the connection can be completed to Shelby Road at the Kings Mountain Boulevard intersection, where conditions are once again favorable.

South of Shelby Road, Phifer Road provides a connection to Kings Mountain Boulevard; however, this alternative route requires a nearly 2 and ¾ mile detour from the corridor. Instead, a new greenway is recommend that would connect Phifer Road to Kings Mountain Boulevard much further north along Beason Creek. This segment of proposed trail is included as part of the Carolina Thread Trail route through Kings Mountain. This proposed route deviates from the corridor only 1.6 miles and would serve the three public schools located just south of the Creek.

Bike racks are recommended along the corridor at Grover and W. Elementary Schools, the Country Club, Kings Mountain Plaza, Westgate Plaza, and Ingles.

**NC 161 Corridor**

The NC 161 Route serves as the primary north-south connector through the City. Heading north along 161, downtown Bessemer City is less than five miles from downtown Kings Mountain. To the south, NC 161 reaches the entrance to Kings Mountain State Park in six miles. Within the study area, the NC 161 Corridor includes Bessemer City-Kings Mountain Highway from Lewis Farm Road at the northern most extent of the ETJ, south across the county line to Cleveland Avenue, then across King Street onto York Road. The corridor crosses I-85 and continues to the southern tip of the ETJ and at the Gaston County line less than one mile from the South Carolina border. The total length of the corridor described is 7.5 miles.
Destinations & Land Use:
The corridor divides neatly into three segments with distinct characters. Bessemer City-Kings Mountain Highway is primarily rural industrial; Cleveland Avenue quickly becomes urban and continues this pattern into York Road north of I-85. York Road south of I-85 exhibits a rural character.

Beginning on the north end of the corridor, industrial sites occupy lands adjacent to the Bessemer City-Kings Mountain Highway – in particular the Buckeye complex. There is also an active drive-in theatre. As Cleveland Avenue enters the City, it passes through the neighborhood of Northwood and Phenix Mill. Linwood Produce makes up part of a small business area at the intersection of Linwood Road. East Elementary School lies just south, adjacent to the US 74 interchange. Just south of the interchange is a recreational complex made up of Deal Park and the YMCA. The Davidson neighborhood lies just beyond. As Cleveland Avenue approaches and crosses King Street, small businesses continue past Gold Street. At that point, major employment centers pop up, interspersed with some remaining single-family homes. A few industrial uses continue south of I-85, but generally the land becomes more rural. City Lake, Davidson Lake, and a Ridgeline Trail trailhead are all located in this southern part of the corridor.

Existing policy:
Commercial and industrial zoning follows much of the corridor, until it leaves the City to the south into residential zoning. The NC 161 Corridor Overlay stretches from the City limit just north of Groves Street, to I-85. From there the York Road Gateway Overlay follows York Road to Lake Road. Refer to Section 4.5 for related policy recommendations and coordination with Cleveland County for properties outside of the Kings Mountain ETJ.

Facility description:
Bessemer City-Kings Mountain Highway is a two-lane road roughly 22 feet wide. The shoulders are not paved but are fairly evenly graded for the most part. Cleveland Avenue does provide some isolated narrow paved shoulders. South of Linwood Avenue, Cleveland becomes a four-lane road approximately 50 feet wide, with curb and gutter, and sidewalk with a narrow grass strip on the west side. As it continues south to pass under US 74 Bypass, Cleveland Avenue widens to 66 feet with a center median and turn lanes. Cleveland Avenue gradually tapers back to a 50 foot width by the Ridge Street intersection, but retains its four lane configuration. Isolated segments of sidewalk abut portions of the east curb. A few isolated patches of woods approach the edges but
there are no street trees. The speed limit is posted at 35 mph. There are no warning signs pertaining to bicycles. Conditions for bicycles are poor due primarily to narrow outside lane width and speeding traffic.

South of Ridge Street, the last block of Cleveland Avenue takes on the strip commercial character of King Street, which continues on York Road in a largely uninterrupted manner until the I-85 overpass. York is three lanes wide with a curb line interrupted frequently with driveways into small businesses. Outer lanes are approximately range from 12 to 14 feet wide. The speed limit is posted at 35 mph. Bicycle safety conditions suffer from frequent curb cuts and heavy traffic.

York Road crosses over I-85 on a five-lane bridge, with wide outside lanes and sidewalks. The posted speed limit increases to 45 mph. This road configuration continues south and is marked with Share-the-Road signs. One-half mile south of I-85, York Road includes paved shoulders and bicycle warning signage. After another one-half mile, the posted speed increases to 55 mph but bicycle safety conditions for mature bicyclists are relatively safe due to the paved shoulders and signage.

Connections:
NC 161 crosses both major and minor east-west corridors in the City, including the Phenix Mill/Northwood corridor at Linwood Road, US 74 Business, and the School & Town route at Gold Street. Cleveland Avenue forms part of the Northwood and Phenix Mill street grids to the north of US 74 Bypass, and the Davidson School grid north of US 74 Business. The 161 Corridor provides the only connection to the Ridgeline Trail within the limits of the City’s ETJ. The majority of this corridor is recommended for inclusion in the east side of the Inner and Outer Loops (Section 4.4)

Scheduled projects:
There are no road improvement projects in the current STIP for this corridor.

Retrofits and alternate routes:
Major improvements are recommended for this corridor, including a road dieting project from Linwood Road to East Ridge Street (refer to Section 5.1 for road dieting considerations) and a new traffic signal at the intersection of Cleveland Avenue and East Ridge Street. See individual project recommendations in Section 6 for detailed descriptions of improvements. Refer to MUTCD Part 4 for consideration of a new highway traffic signal at Ridge Street and Cleveland Avenue.

No alternative routes are suggested for this corridor.

Bike racks are recommended at East Elementary School, the Ridgeline Trailhead, and the YMCA.
NC 216 Corridor

The NC 216 corridor is the longest of the three major corridors traversing Kings Mountain, at nearly 9.5 miles. Beginning at the Gaston County line at the northern end of the ETJ, NC 216 on County Line Road merges with Goforth Road and continues in a southeast direction, following North Piedmont Avenue until it merges with Chestnut Ridge Road. From there, NC 216 heads south and parallels NC 161 about ½ miles to the east. North Piedmont crosses the railway and terminates at North Battleground Avenue. From here, the corridor will hug the east side of the railway, running through the business district as South Battleground, and continuing southwest all the way until it merges with US 29 at I-85. Here the corridor leaves the Kings Mountain ETJ but continues along South Battleground/US 29/NC 216 reaching an island annexation of the City before NC 216 turns south to cross I-85 and the South Carolina border, to continue toward the Kings Mountain National Military Park.

Destinations & Land Use:
The corridor begins at Moore’s (Three-Point) Market and Grill at the county line, then passes by the Shell Food Mart in a rural area of farm fields. In 1.5 miles, the corridor bends south and enters the City and the neighborhood of Phenix Mill. Located here along North Piedmont Ave. within a few blocks of one another are the Citizens Service Center, Mac’s Grocery and North Elementary School. Crossing US 74 Bypass, the NC 216 Corridor enters the neighborhood of Davidson School. A number of small businesses line this section of North Piedmont, including the Chat & Nibble Restaurant. On North Battleground, the old train depot has been converted to an art center. As the corridor passes through the downtown, it essentially becomes the City’s “Main Street” where many prominent commercial and civic destinations are clustered. South of the downtown, and past the Tire Corporation complex, NC 216 passes adjacent to the West End and Margrace neighborhoods. The Gateway Trail Head visitors facility is also located on NC 216. Martin Marietta facility is located on NC 216 at Bethlehem Road, just inside the ETJ.

Existing policy:
North of the US 74 Bypass, NC 216 is mostly residential. Southward, much of the NC 216 corridor is industrially zoned. But as the corridor passes through the downtown business district, it briefly enters two overlay districts: the US 74 Business East Corridor Overlay, and the Downtown District Overlay. Further to the southwest, NC 216 enters the Kings Mountain Boulevard Thoroughfare Protection Overlay. Refer to
Section 4.5 for related policy recommendations and coordination with Cleveland County for properties outside of the Kings Mountain ETJ.

Facility description:
NC 216 enters the county as a two-lane road, roughly 23 feet wide, with shoulders that are not paved and tending to slope at a noticeable grade. Brief patches of 6”-12” paved shoulder appear periodically. The speed limit is posted at 35 mph. Conditions for bicycles are poor due primarily to narrow outside lane width and speeding traffic. There are no warning signs pertaining to bicycles.

Facility conditions do not improve until the road begins to widen near Fairview Street at Mac’s Grocery. Here the lanes broaden to between 14 and 16 feet, curbs are apparent, and sidewalks begin with narrow planting strips. At Linwood Avenue, NC 216 expands to four lanes. The posted speed limit remains at 35 mph. There are no warning signs pertaining to bicycles. Conditions for bicycles are poor due primarily to speeding traffic.

NC 216 crosses over US 74 Bypass on a bridge that features outer lanes of 12 to 14 feet and four foot sidewalks bordered by high metal rails. The bridge presents little safety challenge for bicyclists.

As NC 216 reenters the City grid, it continues to be lined by curb and sidewalks with intermittent planting strips. The eastern lane width varies from 11 to 13 feet, but the western lane, even with parallel parking in segments, provides ample width for safe bicycle passage. Commercial buildings that line the street have minimal setbacks, which tend to slow traffic and increase bicycle safety.

Crossing the railway, North Piedmont merges with North Battleground Avenue, and the posted speed limit drops from 35 to 25 mph. The eastern lane of North Battleground is about 14 feet wide, and the western lane as much as 18 feet. But between the street and the railway, the old depot provides a parallel path opportunity. In addition to the 850 linear feet currently paved, another 250 foot section that is currently unimproved links to the North Piedmont Avenue intersection. From the south end of the paved depot area, the street width provides a safe connection as far as the Southern Railway Bridge, but then pinches down as it approaches King Street, with a low rail between the street and the steep slope down to the railway.

The two-block segment from King Street south to Gold Street is a very commercial urban in character. It features diagonal, right angle, and parallel parking in segments to serve the adjacent businesses on the east side.

South of Falls Street, parking adjacent to travel lanes ceases. Posted speed increases once again to 35 mph, then quickly to 45 mph just two blocks south at Hawthorne Street. At this point, the width of lanes begins to narrow and bicycle safety conditions are severely worsened.
Conditions do not improve along the corridor except in only brief segments where paved shoulders exceed 6 inches width; that is until the point where the alignment was changed to join the new Kings Mountain Boulevard ¼-mile away. Here 4-feet wide paved shoulders are provided. Pre-improvement conditions return ¼-mile on the west side of the Boulevard and continue until the merger with US 29, which is a four-lane, median divided highway. NC 216 leaves US 29, and turns south as a 2-lane road to cross I-85.

**Connections:**
NC 216 crosses both major and minor east-west corridors in the City, including Linwood Road, US 74 Business, and Gold Street. North Piedmont Avenue forms part of the Phenix Mill street grid to the north of US 74 Bypass, and the Davidson School grid north of US 74 Business. NC 216 bisects the historic downtown grid of Kings Mountain parallel to the railway. South of the downtown, and past the Tire Corporation complex, NC 216 provides a connection for the West End and Margrace neighborhoods to the Gateway Trail visitors facility and to downtown. Finally, NC 216 crosses the Kings Mountain Boulevard corridor before leaving the City's ETJ. The segment of the Corridor on North Piedmont Avenue from Scism Road to Center Street lies within the Outer Loop, as does the segment on South Battleground from the Gateway Trailhead to Kings Mountain Boulevard. The Outer Loop also includes portions of NC 216 from Waco Road to King Street, and again for a short length from Falls Road to Oak Street. See Section 4.4 for a description of the Inner and Outer Loops.

**Scheduled projects:**
There are no road improvement projects in the current STIP for this corridor.

**Retrofits and alternate routes:**
Some of the recommended bicycle facilities in this Plan could provide opportunity for parallel courses to the NC 216 corridor and allow bicyclists to wind through neighborhood streets with generally safer conditions.

North of Mountain Street, this includes the proposed Cansler Street bike lanes, which can be accessed from NC 216 by McGinnis Street to the North Elementary Greenway to Bridges Street, or by Waco Road, or by Ridge Street across the Southern Railway Bridge, and back to NC 216 by the Mountain Street proposed bike lane.

South of Mountain Street, an alternative route through the West End and Margrace neighborhoods involves taking Oak Street to Railroad Avenue to Hawthorne Road to Meadowbrook Road to Oakland Street to Huntingtowne Drive, across the proposed bike and pedestrian bridge to Wintergreen Court to Caldwell Street to Fulton Road to Margrace Road to Kings Mountain Boulevard, which then shortly connects back to NC 216. Bike boulevard improvements are recommended for this alternative route.
Despite these opportunities for safe alternatives close to the NC 216 Corridor, the improvements described in this Plan to NC 216 facilities themselves are still strongly recommended. NC 216 provides a direct route through the City that reaches many major destinations. However, this Plan does not include recommendations for NC 216/South Battleground Avenue south of the Margrace Road intersection. There are also no on-road improvements recommended for the segment of NC 216 by the Art Center. Instead, the project recommendations go off-road into the Art Center itself. See Section 4.3: Focus Area 2 for a detailed description of proposed treatment for the Art Center area.

Bike racks are recommended along the corridor at the Citizens Service Center and the Art Center; and can already be found at the Gateway Trailhead.

School & Town Corridor

This secondary corridor spans a significant distance through the City, connecting York Road to Kings Mountain Boulevard over a travelled distance of 3 & ¼ miles. Beginning at York Road, the corridor follows Gold Street westward, crosses the railway, then jogs north one block on Railroad Avenue to follow Mountain Street westward onto Phifer Road, and then all the way to Kings Mountain Boulevard.

Destinations & Land Use:
As the name suggests, the corridor connects many of the area schools to the downtown. Phifer Road is home to Kings Mountain High, Middle, and Intermediate Schools, while West Elementary School is also located on the Route on Mountain Street between Goforth and Watterson. The route travels through the residential neighborhood of West End, and along the edge of Margrace. It also provides an efficient connection to both the Country Club and Davidson School neighborhoods. Also included along this corridor are many downtown civic, recreational and commercial destinations.

Existing policy:
The School & Town Corridor passes through primarily residential zoned land. It also enters the Downtown District and the West End Historic District. It also terminates at the NC 161 Corridor Overlay and the Kings Mountain Thoroughfare Overlay.
Facility description:
From York Road to near Gaston Street, Gold Street is a narrow road with 10 foot lanes and narrow grass shoulders. At Gaston, the road widens to include a turn lane. Curb and gutter is added, along with a north side sidewalk and planting strip. Crossing Gaston Street, Gold Street converts to four lanes and remains so until terminating in a T at South Battleground Road. To remain on the corridor, a bicyclist must veer onto South Battleground Avenue before crossing the railway at grade. Visibility is slightly hindered at the crossing by the grade over the railway. Once across the railway, the corridor travels one block north on South Railroad Avenue to join Meeting Street. This series of four intersections is quite complex. The bicyclist must contend with multiple lanes of traffic, on-street parking, drivers distracted by downtown sites, and periodic railroad activity. There are no designated bicycle lanes, or warning signs.

Mountain Street provides the connection from Railroad Avenue to Phifer Road. It is a two-laned, 32-feet wide street with curbs, sidewalk, planting strips, traffic signals, on-street parking, and street trees. This segment is also recommended as an alternate route for a portion of US 74 Business. Bicycle safety conditions are relatively good for school-aged bicyclists, but could be improved by the addition of bike lanes and warning signage.

Phifer Road is a 26-feet wide road connecting Mountain Street to Kings Mountain Boulevard. From Mountain Street it features a sidewalk and planting strip on its west side. Much of the adjacent land is sparsely developed. The posted speed of 35 mph is reduced to 25 mph as Phifer Road crosses Beason Creek into the school zone. Here curb and gutter is introduced as well as a turning lane into the High School. At Maner Road, the curb and gutter disappear on the east side. Within a block, there is no curb and gutter on either side, but the sidewalk continues with a very narrow planting strip on the west side. Grassed shoulders slope noticeably. At Southridge Drive, Phifer Road bends westward. The sidewalk leaves the street to join the Middle School parking lot. A west side curb reemerges as does a second westward bound lane, which becomes a turn lane. As the road leaves the school zone, it reverts back to a 2-lane facility with grassed shoulders until the intersection with Kings Mountain Boulevard. Bicycle safety conditions along Phifer Road are relatively unsafe for school-aged bicyclists due particularly to the narrow paved lanes and the lack of warning signage.

Connections:
The School & Town Corridor connects the NC 161 Corridor to the Kings Mountain Boulevard Corridor. In so doing, it crosses the NC 216 corridor and merges for a segment with the recommended alternate for the US 74 Business Corridor. The School & Town Route forms part of the proposed Inner Loop. See Section 4.4 for additional description of the Inner and Outer Loops.

Scheduled projects:
There are no road improvement projects in the current STIP for this corridor.
Retrofits and alternate routes:
No on-road alternative routes are suggested for this corridor, but a significant opportunity exists for an off-road multi-purpose route to serve the school complex utilizing the designated Carolina Thread trail route along Beason Creek between Phifer Road and Kings Mountain Boulevard. The route can continue westward along the Creek to follow the Thread Trail to Crocker Road. Significant on-road improvements are recommended for the entire length of the corridor.

Bike racks are recommended along the corridor at the Post Office, the Government Center, the Little Theater, West Elementary School, and the Middle and High schools along Phifer Road.

Phenix Mill/Northwood Corridor

This secondary corridor serves the northeast section of the City, from East End Avenue at the eastern City limit, to North Cansler Street. It spans the width of the City’s incorporated area north of the US 74 Bypass in a total length of 1.8 miles. It follows Linwood Road from its eastern end in the Northwood neighborhood, makes a brief southward jog on North Piedmont, enters the North Elementary School zone via Lackey Street, then continues westward on Bridges Road until Cansler Street.

Destinations & Land Use:
The corridor connects the Northwood and Phenix Mill neighborhoods to the North and East Elementary Schools, and to businesses at the Linwood and Cleveland Avenue intersection. Industrial uses dominate the south side of Linwood between Phenix Street and Phillips Drive.

Existing policy:
The NC 161 Corridor Overlay crosses over Linwood Road. Aside from the businesses concentrated there, and the industrial zone to the west, the Corridor is zoned residential.

Facility description:
Linwood Road is primarily a 2-lane facility with curb and gutter. From the eastern City limit, the pavement is 34 feet wide and features on-street parking. East of NC 161 the speed limit is posted as 35 mph. West of NC 161, the posted speed drops to 25 mph and the width of pavement eventually decreases to 22 feet, losing the curb. Linwood Road crosses the railway at grade, and veers left onto a wider 30-foot facility with a sidewalk and planting strip on the north side. Approaching N. Piedmont Avenue, Linwood broadens to 4 lanes with curb and gutter and sidewalks on both sides. Linwood Road terminates at N. Piedmont Avenue.
The intersection is signalized and features a striped crosswalk on N. Piedmont. The turning radii are very wide, as is the intersection itself. Visibility is quite limited from the south as N. Piedmont curves.

The portion of the Corridor along N. Piedmont is only 350 feet in length with a speed limit of 35 mph. The pavement is 52 feet wide with 4 lanes, curb and gutter, narrow planting strip and sidewalks on both sides. The Corridor continues west for one block on Lackey Street, which for this segment measures 34 feet wide, features curb and gutter, and a speed limit of 25 mph. The Corridor turns north on Ramseur for one block, then follows Bridges Street until it ends at N. Cansler Street. These latter two streets are typically 22 feet wide with no curb. The speed limit is set at 35 mph for Bridges Road.

**Connections:**
To its north side, the Phenix Mill/Northwood Corridor feeds into two neighborhoods that are well connected internally. The corridor also crosses the NC 161 corridor, which provides a connection to the Outer Loop.

**Scheduled projects:**
There are no other road improvement projects in the current or draft STIP for this corridor.

**Retrofits and alternate routes:**
An alternative route recommended for a segment of this corridor involves an off-road multi-purpose path through the North Elementary School property. The path would depart from Lackey Street east of the residence, follow the eastern edge of the south field, cross the interior drive that provides the connection to Bridges Street, cross in front of the school building, and connect to McGinnis Street. On-street improvements are recommended for the remainder of the corridor.

Bike racks are recommended along the corridor at Linwood Produce and N. Elementary School.
The Boulevard Corridor

To the west of the City lies a relatively recent facility that provides a consistent, bicycle-friendly corridor, from US 74 Business at Shelby Road, to I-85. Its total length is three miles.

Destinations & Land Use:
This corridor is largely undeveloped, but it does lie adjacent to a single-family residence subdivision, an apartment complex, and the Kings Mountain school complex in the Phifer Road area. The corridor also provides a connection to the Kings Mountain Travel center, just south of I-85.

Existing policy:
The entire corridor is included in the Kings Mountain Boulevard Overlay. It also enters the US 74 Business West Overlay at its northern extent. North of NC 216, the corridor lies within residential zoning. South of NC 216, the zoning is predominantly industrial, with an area of commercial south of I-85.

Facility description:
Beginning at US 74 Business, Kings Mountain Boulevard is a 2-lane road with 2-foot to 4-foot wide paved shoulders on both sides. Posted speed limit is 55 mph. These conditions remain until approaching I-85 on Dixon road, where the paved shoulder begins to deteriorate to a 6-inch band. Once across I-85, narrow paved shoulders persist to the Travel Center. With the consistent run of wide paved shoulder, conditions are quite favorable for mature cyclists but, due to the higher vehicular travelling speeds, the facility is not safe for less experienced riders.
Connections:
The Boulevard serves to connect the US 74 Business Corridor, as well as its recommended alternate route joining at Dick Elam/Shelby Road, to the School & Town Route. The Outer Loop follows Kings Mountain Boulevard from US 74 Business to Margrace Road. The corridor also provides a connection to the proposed Carolina Thread Trail along Beason Creek, and one of the few connections across I-85. See Section 4.4 for additional description of the Inner and Outer Loops.

Scheduled projects:
Dixon School Road (SR 2487) and Kings Mountain Blvd (SR 2487) are scheduled to be widened to a four lane divided boulevard from I-85 to Shelby Road (US 74 Business) in the STIP.

Retrofits and alternate routes:
No on-road alternative routes are suggested for this corridor. With the existing paved shoulders along most of the corridor, only additional signage is recommended with some minor widening in some locations.

Bike racks are recommended along the corridor at the Intermediate School and Kings Mountain Travel Center.

The Lake Connector

Continuing north past the US 74 Bypass, Shelby Road becomes Stony Point Road. From this point, the John H. Moss Reservoir (Moss Lake) is roughly four miles distant. The first of those miles is within the City ETJ. About one mile further, Stony Point Road intersects with Oak Grove Road. In total, The Lake Connector Corridor stretches 2¼ miles, terminating at Oak Grove Road.

Destinations & Land Use:
This corridor is primarily rural in nature, with some single family residences and mobile homes. At the junction of US 74 are an industrial use, Bethware Elementary School, and a church. Crossroads Music Park is also located on Stony Point, just south of Potts Creek.
Existing policy:
Besides the single industrially-zoned parcel, the corridor is completely zoned residential. Refer to Section 4.5 for recommendations concerning residentially zoned properties, and coordination with Cleveland County for properties outside of the Kings Mountain ETJ.

Facility description:
Beginning at US 74 Bypass, Stony Point Road is a 2-lane facility with 2-foot paved shoulders on both sides. The posted speed limit for the entire corridor is 45 mph. With the consistent run of paved shoulders, conditions are quite favorable for mature cyclists but, due to the higher vehicular travelling speeds, the facility is not safe for less experienced riders.

Connections:
The Lake Connector is the City’s link to the Reservoir. The route is used is part of the Over the Mountain Triathlon. It also links to the US 74 Business Corridor and the Carolina Thread Trail.

Scheduled projects:
There are no road improvement projects in the current STIP for this corridor.

Retrofits and alternate routes:
The northern portion of the Lake Connector corridor - from Potts Creek to Oak Grove Road – follows the adopted Carolina Thread Trail alignment, which continues westward to the Reservoir. An off-road alternative route is recommended which continues along the proposed Thread Trail alignment along Potts Creek. The creek crosses Stony Point Road 0.35 miles south of the Oak Grove Road intersection and runs about ½ mile to the east of Stony Point Road. Potts Creek continues into the City, providing a potential trail connection to as far as Sims Street, but where the Creek crosses under Countryside Road, there is opportunity for the bicyclist to use Countryside to rejoin the US 74 Business corridor. This alternative route includes 2.2 miles of multi-purpose trail together with 0.3 miles of on–road route utilizing Countryside, for a total of 2½ miles. To establish the connection across US 74 Business, the Potts Creek trail passes under the highway, utilizing one of the three existing box culverts and a raised or cable-suspended bridge, or similar. Another potential connection exists between this alternative route and Stony Point Road using Hoyles Road. This connection would require some on-road improvements and an 800-foot trail. Existing paved shoulders should be widened to four feet, and additional signage is recommended along Stony Point Road.
4.3 Focus Areas Recommendations
KEY LOCATIONS IN THE BICYCLE COMMUNITY

Certain locations within the study area will benefit from more detailed planning considerations for bicycle use. These areas are in prominent locations, with key destinations in their vicinity, and connections to multiple bicycle corridors. They also present challenges due to their complex traffic patterns, peculiar road geometries, and physical constraints. These areas of potential high use are described below in terms of their value as attractors for bicycle traffic as well as their existing facilities (bundled under the term “assets”), and the safety considerations and design constraints they pose (“challenges”). The list of proposed design treatments included for each focus area have been generated from planning level analysis only. More detailed engineering analysis is required before physical alterations are made.

For additional details on the facility improvements proposed, see Section 5: Facility Standards & Guidelines, Section 6: Proposed Projects List, and Section 7: Proposed Routes and Facilities Map.

Focus Area 1: South Battleground Avenue from Mountain Street to Oak Street intersections

Assets:

- Commercial, civic, entertainment and recreational destinations, near residential areas and industrial employment center
- Intersection of a North-South and an East-West corridor
- Intersects Inner Loop (Section 4.4)
- Downtown CBD with Downtown District Overlay has Main Street feel with minimal front yard building setbacks, sidewalk, street trees set in planters
- Three existing traffic lights
- Intersection of collector roads
- Striping includes stop lines, crosswalks, directional arrows, parking lines
- Raised curbs
- Public art in view
- Street lights

Challenges:

- Complex 150’ offset intersection with multiple collision points
- 3 and 4-lane roads
Multi-directional on-street parking (parallel, diagonal and perpendicular)
Vehicular traffic (roughly 6000 AADT), including heavy truck traffic
Downtown pedestrian activity
Adjacent railroad R-O-W

**Proposed Treatment:**
This combination of intersections forms the junction of two proposed road improvement projects recommended in this plan. Redesign elements are described here for all road segments and intersections:

- Convert perpendicular and diagonal parking along the west side of South Battleground Ave. to parallel parking orientation to increase safety and permit additional lane width for bicycle improvements. Alterations to existing bulb-outs on west side of Battleground Avenue may be required to permit proposed bike lanes.

- Restripe South Battleground Avenue to permit Sharrow lanes from Mountain Street to Oak Street, parallel parking on both sides from Mountain Street to East Gold Street, and parallel parking on the west side only from East Gold Street to Falls Street.

- Within the intersections of South Battleground with East and West Gold Street, add Sharrow intersection crossing markings oriented between the proposed South Battleground bike lanes to provide a continuous visual connection to guide bicyclists and remind motorists of bicycle traffic (See sample detail in Section 5.4). These markings are required only on the side of each T-intersection that is crossed by traffic. Bike lanes should continue uninterrupted on the opposite side. Wide outside lanes shall extend north of Mountain Street to Ridge Street.

- Manage access to the commercial use on the southeast corner of the southern intersection by extending the curb line south along South Battleground Ave. to permit a standard 2-lane wide egress located as far from the Gold Street intersection as permissible. Narrowing this egress point will improve safety conditions for all modes of traffic.

- Add appropriate signage to indicate: presence of bicycle riders (Share the Road), bike lanes ahead, bike lanes ending, and Inner Loop way finding signs to serve at the Falls Street and Oak Street intersections.
Focus Area 2: Art Center

Assets:
- A primary cultural activity center for the City (Southern Arts Society, Inc.)
- Intersection of a north-south and an east-west bicycle corridor
- Location on the Inner Loop (See Section 4.4)
- Near Grover School, commercial centers and residential neighborhood
- Existing traffic light
- Expansive off-street paved and unpaved areas (1,100 feet by up to 80 feet wide) presents opportunities for off-street path
- Street lights

Challenges:
- Two acute angled intersections (N. Piedmont and Parker with N. Battleground)
- Located on minor arterial road with vehicular traffic at roughly 5200 AADT, including heavy truck traffic
- Adjacent railroad R-O-W serving railway and railway maintenance staging area
- Narrow road pavement on N. Battleground adjacent to south portion of Art Center area
- Off-street pavement is worn

Proposed Treatment:
This focus area includes a proposed road improvement project and two off-road projects recommended in this plan. Redesign elements are described here for each road segment, intersection, and the off-road paved area and open space.

- Provide bike lanes on N. Piedmont Ave. from East Parker Street to Waco Road. Use wide outside lanes where pavement width does not permit bike lanes. Avoid including width of gutter in bike lane width even if gutter is paved over. But if necessary in order to obtain adequate width, additional maintenance will be required to maintain asphalt over concrete gutter pan.
- Provide off-street striped bicycle lane/path along north-south length of paved Art Center area. Coordinate installation (striping and signage) with off-street parking lot repaving schedule. Continue Inner Loop (Section 4.4) by linking to East Ridge Street WOL with signage. Signage should also continue link southward toward downtown.
- Install off-street multi-use trail from north Art Center driveway to N. Piedmont Ave. at railway crossing. Coordinate with Norfolk-Southern Railway for easement use and to align trail near the street edge to avoid railroad periodic maintenance staging area.
• Indicate off-street bicycle path and continuation of Inner Loop (Section 4.4) in Art Center with directional way finding signage at the three street entrances to the Art Center for bicyclists on N. Battleground Ave., and at beginning of multi-use trail at N. Piedmont Ave.
• Install bike racks at Art Center adjacent to primary building.
• Consider the use of sharrows in the short-term along North Piedmont from Ridge to Parker until construction of the off-road facility.
• Install additional appropriate signage to indicate: presence of bicycle riders, direction to off-street path, bike lane begin and end, Inner Loop way finding signage at intersection of Ridge Road.

Focus Area 3: Cleveland Avenue and Linwood Road intersection

Assets:
• Neighborhood commercial destination near school, employment centers and residential areas.
• Intersection of a north-south and an east-west bicycle corridor
• Location on the Outer Loop (Section 4.4)
• Location in NC 161 Corridor Overlay
• Existing traffic lights
• Intersection of collector roads
• Striping includes stop lines, crosswalks, directional arrows
• Raised curbs
• Street lights

Challenges:
• Acute angled intersection
• Vehicular traffic (roughly 6400 AADT) including heavy truck traffic
• Multiple lane intersection
• Adjacent driveways create multiple collision points
• Numerous egress points (driveways)

Proposed Treatment:
This intersection marks the junction of four proposed road improvement projects recommended in this plan. Redesign elements are described here for each of the four legs of the intersection:

SOUTH:
• The Cleveland Avenue bike lane project involves reducing the four lanes of Cleveland Ave. on the south side of the intersection to two lanes with a median and bike lanes.
• Use standard AASHTO bike lane/right turn lane configuration at the Linwood intersection.
• Provide a shared bicycle/pedestrian refuge island in the proposed median at the intersection.
• Place appropriate signage to indicate: presence of bicycle riders, bike lane ending, Outer Loop way finding.

WEST:
• The Linwood Avenue bike lane project requires lane striping and signage. Where the existing road width does not permit bike lanes, use wide outside lane, or widen road.
• Manage access to the commercial use on the northwest corner of the intersection by closing the egress point closest to the intersection, in order to improve safety conditions for all modes of traffic.
• Place appropriate signage to indicate: presence of bicycle riders, bike lane ending, Outer Loop way finding

NORTH:
• Paved shoulders for this portion of Cleveland Ave. may require some widening of pavement and grading.
• Manage access to the commercial uses on the northwest and northeast corners of the intersection by closing the two egress points closest to the intersection, in order to improve safety conditions for all modes of traffic.
• Place appropriate signage to indicate: presence of bicycle riders, Outer Loop way finding

EAST:
• Wide outside lanes on Linwood Ave. are compromised for a short distance by the addition of the turn lane at the intersection.
• Manage access to the commercial uses on the northeast and southeast corners of the intersection by closing the two egress points proximal to the intersection, in order to improve safety conditions for all modes of traffic.
• Place appropriate signage to indicate: presence of bicycle riders, Outer Loop way finding

As the bike lanes do not cross the intersection, there are no additional improvements recommended for the intersection interior.
4.4 Route Recommendations
GUIDING THE BICYCLE COMMUNITY

Bicycle routes are designated preferred courses for cyclists to reach significant destinations or to ride for enjoyment or exercise. In the case of Kings Mountain, two bicycle routes have been included in the overall facility network: the Inner Loop and the Outer Loop. The alignments of these routes were selected in order to provide continuous riding loops for cyclists that would help meet the goals of the Plan, namely:

- Provide for a safe bicycling experience
- Connect cyclists to popular places like schools, businesses, downtown, and neighborhoods
- Create ways around barriers
- Provide both an on-road and off-road bicycle experience
- Serve all segments of the population with opportunities for commuting, recreation, healthy exercise, scenic enjoyment, and relief from automobile traffic
- Foster economic development
- Utilize existing facilities

The Inner Loop’s 7.5 mile length encompasses the downtown area and connects many key destinations and neighborhoods. The Outer Loop, along its 24 mile length, provides more of a scenic and recreational experience. Both Routes utilize a full variety of facility types, much of which requiring only minimal improvements. The two routes connect at the intersection of Cleveland Avenue and Ridge Street and, so in a sense, form a figure-8. The proposed alignments for both routes are shown in Section 6: Proposed Routes & Facilities Map, and are described below:

**Inner Loop**

East Ridge > Canterbury > cross 85 > frontage road >
York Rd > cross 85 > York Rd >
- Martin Marietta Materials driveway > utility easement > quarry road > Falls > wooded path to S. Gaston
  (as the ultimate route)
- or: E. Gold (as a preliminary route)
  > E. Gold (connect to Gateway Trail) > S. Battleground > W. Mountain (Carolina Thread Trail)
  > Sims (connect to potential Potts Creek Trail) > W. Parker > Childers > Cansler > W. Ridge > N. Railroad
  > little bridge (closed to vehicular traffic) >
  Battleground > E. Ridge (end)

**Inner & Outer Loop Route arrangement**
**Outer Loop**

Kings Mountain Blvd (connect to potential **Beason Creek Trail**) > Shelby Rd > Countryside > Patterson > cross 74 > Putnam Lake > Scism > N. Piedmont > Center > 2nd / Herndon Access > BC KM Hwy / Cleveland (161) > cross 74 > E Ridge (joins **Inner Loop**) > Canterbury > cross 85 > frontage road > York Rd > Galilee Church > proposed **Carolina Thread Trail** on Kings Ck > cross 85 via old bridge > **Gateway Trail** > E. Gold > S. Battleground > W. Mountain > Phifer (connect to potential **Beason Creek Trail**) > Kings Mtn Blvd.

Often, such bicycle routes are keyed to a user map. See **Sections 5.9 & 5.15** for further details.
4.5 Policy Recommendations
DEVELOPING A BICYCLE COMMUNITY

A community cannot effectively implement plans to achieve a vision without guiding principles in place. These principles are codified into a body of policy, which gives direction to the community as it determines the most effective and appropriate strategies for implementing projects. Policy also guides the selection of programs and spending priorities.

With the adoption of its Comprehensive Bicycle Plan, the City of Kings Mountain has official policy that specifically identifies the location of proposed on-road and off-road bicycle facilities. The Plan specifies where these bicycle improvements are to be placed, how they are to be designed, and the publicly-driven priority for when they are to be installed. This Plan and other related policy should be consistently referenced when making larger transportation and land use decisions.

The Plan is based upon the following guiding principles. These same principles should guide how the Plan is implemented:

i. Make bicycling a viable transportation option by providing bicycling facilities that connect important destinations to neighborhood and regional bicycle routes, bicycle lanes, greenways and multi-purpose paths.

ii. Adopt land use practices that support mixed residential/non-residential zoning, connectivity between adjacent land use and neighborhoods, and infill development to give bicyclists of all skill levels a realistic opportunity to use their bicycles as a viable means of transportation.

iii. Encourage the addition of amenities that make biking pleasurable and practical such as landscaping, traffic calming, public restrooms and showers, lockers, bicycle racks, and recreational facilities.

iv. Create an atmosphere where motorists are familiar with driving near bicyclists, where bicyclists are comfortable riding near motorists, and where the many physical and operational obstacles that bicyclists currently face are corrected.

v. Promote awareness of the wide-ranging benefits of bicycling throughout the community.

vi. Designate, design and modify appropriate streets to accommodate automobiles and bicyclists together. Collector roads may require bicycle lanes and other design modifications, whereas lower speed and volume roads may not require any modifications.

vii. Consider the provision of bicycle facilities as a legitimate element on all new and existing streets before resurfacing, street widening or construction projects are undertaken.

viii. Set aside land for paths/trails in new development.

ix. Revise City ordinance to reflect the above principles in the manner appropriate for the community.

With a view to these guidelines and in order to achieve the stated community vision and goals which form the basis of this Plan, the following actions are recommended.
1. Form a stakeholder-based Kings Mountain Bicycle Committee (KMBC).
The KMBC should represent a wide variety of interests and populations in the City. Members should include representatives of the business community, long-time residents, and residents of recent residential developments. Various areas of expertise represented by the KMBC should include:

- Transportation
- Downtown Commerce
- Industry
- Health, Fitness & Recreation
- Safety and crime prevention
- Education
- Tourism
- Environment
- Engineering and Design
- Public outreach

The purpose of the KMBC is to ensure that the Bicycle Plan remains in the forefront of public awareness, that it is implemented through ordinance changes, grant opportunities, and as development occurs in the private and public sectors. The KMBC should also help assure that the Bicycle Plan is updated as needed to reflect changing conditions and bicyclist needs, and is integrated with other planning processes. The group can serve to advocate, monitor, facilitate, and educate. The KMBC should also ensure that citizens are alerted of planning efforts, changes in facilities, and upcoming construction that will affect the bicycling environment of the City.

**Implementation Strategy:**
City staff shall recommend a list of candidates to the City Council, who shall then appoint KMBC members and invest them with the authority and charge to pursue the Committee’s purpose stated above. It is recommended that the KMBC include a City elected official.

2. Implement Plan Recommendations through Local Land Development
The City can promote the construction of bicycle facilities through a variety of methods involving land use regulations. A summary of suggested implementation tools follows (many of which are already in place to some degree):

1. Citing Adopted Plans When Making Land Use Decisions
North Carolina’s general statutes do not mandate strict adherence by local governments to their adopted land use and transportation plans. The general statutes were amended, however, in 2005 to require that all local governments consider these plans when making their land use decisions and to include “a statement of consistency” with all zoning changes. Thus, this Study upon adoption should be given the same weight and attention as any other locally adopted comprehensive plan, land use plan, transportation plan or small area plan. The City should incorporate the Plan’s recommendations in all future site plan approvals.

The approved Comprehensive Bicycle Plan should also be cited and considered when the City issues “conditional use” or “special use” permits. Most communities that issue these permits have a finding of fact in their land use regulations that states something akin to “the proposed
use must be in harmony with the land use plan and any other adopted plan for the physical development of the community.”

2.) **Updating local zoning ordinance document**

Although the Kings Mountain Zoning Ordinance was updated as recently as June, 2009, its format still largely reflects the original type-written document adopted in 1996. An updated, more user-friendly ordinance can be part of a strategy to better communicate zoning regulations to the development community, design professionals, citizens, and business owners, and make the ordinance easier to administer.

**Implementation Strategy:**
- Review current zoning districts to ensure they support City objectives.
- Create a modern, concise list of uses with a corresponding use/zoning district matrix.
- Revise the zoning ordinance document to make it easier to use, clearer, more cohesive, and more concise. Interactive, user-friendly zoning ordinances can include color graphics, navigation tabs, and hyperlinks.
- Include additional and updated discussion of City goals and objectives within the zoning ordinance.
- Consider creation of a Unified Development Ordinance for the City and its ETJ.
- Review zoning approval processes and procedures including the level at which action is taken on zoning applications to ensure the process is commensurate with the impact of the proposal and the amount of discretion available.
- Update development standards, definitions, findings, and administrative provisions.
- Revise the City’s website to make the online zoning ordinance easier to use. This could include providing a name or explanation for each of the Zoning Ordinance sections in addition to the Article number.

3.) **Infill Zoning**

Downtown Kings Mountain (having been built prior to the 1950s) was developed with the pedestrian (and bicyclist) in mind with blocks being relatively short in length and laid out in a basic grid pattern. Lot sizes here tend to be small, and a mix of uses lies within close proximity, easier to reach by foot or bicycle. Modern forms of development stand in stark contrast to these practical conventions. In place of a grid of local and interconnected streets, wide and heavily traveled collector roads designed primarily for the automobile, as opposed to the bicyclist or pedestrian, serve as the only means of connection. Bicycling on such heavily travelled roads, even with a dedicated bicycle lane, can be uninviting if not physically dangerous.

In recent years, communities have realized the great economic development potential that exists with redevelopment of older areas. Allowing and accommodating development in these “infill” areas through appropriate land use regulations is not only a plus for the community as a whole, but a benefit to the pedestrian and bicyclist.
4.) **Mixed-Use Zoning**
In recent years, an increasing number of local governments have become more willing to allow for a mixture of uses where persons could theoretically live, shop and work all within a relatively small geographic area, thereby making bicycling and walking more feasible modes of transportation. Such mixed zoning arrangements can take many forms:

1. mixed-use developments on a large scale (e.g. Birkdale in Huntersville) or on a small scale with storefronts on the ground floor of buildings and residential units on upper stories; or,
2. zoning districts that allow and encourage residential uses and non-residential uses to locate near each other

The end result of either of these arrangements is increased opportunity for getting around by means other than the automobile. This is of particular importance in the downtown and other commercial areas. Encouraging or requiring such development supports non-vehicular travel and creates an environment where bicycling is a preferable mode of travel.

5.) **Required Green Space with Priority for Trails and Bicycle Lanes**
In addition to the recommended on-road facilities, many of the links recommended in the Bicycle Plan are by way of proposed greenways. Creek lands, particularly those within utility right-of-ways and existing parks can be most readily utilized.

North Carolina’s General Statutes (NCGS 160A-372 for cities and NCGA 153A-331 for counties) allow local governments to mandate the dedication of open space in subdivisions. In lieu of open space dedication, local governments can mandate that a fee be paid. Those fees may be used by that local government for recreation and open space purposes only.

Local governments are now starting to give more emphasis to bicycle and greenway plans by stating that if such an adopted plan shows a trail crossing the property to be subdivided, land for such trail must be set aside (as opposed to allowing a fee to be paid or substituting other lands to be dedicated for recreational purposes). Such language gives lands for greenways, bicycle or multi-purpose trails higher consideration than other types of land to be set aside or constructed.

6.) **Identification and construction of bicycle lanes within subdivisions where such lanes have been designated.**
As mentioned earlier, one of the best means of ensuring the installation of bicycle lanes is to incorporate the recommendations from this Plan into the local land use documents. The Plan calls for the creation of bicycle lanes and related improvements on certain roads. To ensure that those road segments will NOT be overlooked in the future, the City should reference the adopted plans and require their construction when adjoining properties are subdivided or developed in the future. In certain instances this can necessitate additional right-of-way, which can be required by the City or NCDOT.
7.) **Bicycle Amenities**
A growing trend in land use regulations is the requirement for the installation of facilities for bicyclists (e.g., bicycle racks) for new or expanded civic land uses (e.g., libraries, city/town halls, community centers, schools, etc.) as well as uses that attract large numbers of persons (e.g., shopping centers).

8.) **Public Transportation**
Making concerted efforts to locate civic uses along or near transit lines (or Park & Ride locations) will certainly increase their utilization by bicyclists and others who might not otherwise have access to vehicular transportation. This can be accomplished by amending local land use regulations to give preference to such uses along transit lines (i.e., making them uses by right as opposed to conditional uses, by relaxing off-street parking requirements, lowering development fees, etc.).

9.) **Street and Neighborhood Connectivity**
A growing trend in recent years has been to limit (or in some cases, eliminate) the use of cul-de-sacs and to mandate (unless physical factors dictated otherwise) that new subdivisions connect or have stubs for future connection with adjacent properties. Fewer cul-de-sacs and more interconnections give pedestrians, bicyclists, and drivers, more options for completing a trip.

**Implementation Strategy:**
1. In order for the City to implement these strategies, they must be specifically allowed in the local land use regulations. Many of City’s regulations and current policy documents complement and can work directly in tandem with the Bicycle Plan. Review adopted policies, particularly those cited in the Bicycle Plan, Section 2. Resolve any conflicts that exist between these documents and current ordinance.
2. Identify the complementary goals, any common funding strategies, and potential private partners. Discuss priorities, strategies and responsibilities with all pertinent municipal staff, planning board, the KMBC and elected officials.
3. Locate proposed facilities according to the Bicycle Plan with minimum deviation from alignments shown.
4. Ensure that all new development respect planned or proposed corridors for greenways.
5. Establish partnerships with local corporate entities, citizen action groups, and regional public organizations (such as Centralina COG)
6. Target specific projects for funding and implementation efforts.
7. Engage the public and development community with education campaigns and open house events.

3. **New road construction: coordination with NCDOT and LNRPO**
Most bicycle-related improvements occur within state-maintained right-of-way along state-owned roads. NCDOT has well-established policies and regulations regarding the implementation of bicycle plans. In 2009, the NCDOT Board of Transportation approved a “Complete Streets” policy that, among other
things, incorporates multimodal alternatives in the design and improvement of all appropriate transportation projects within a municipality or county unless exceptional circumstances exist, and should be referenced by municipalities and counties when conducting site plan reviews and making other land use decisions. This policy will work very well for traditional capital improvement projects, but it is unclear how effective it will be regarding maintenance projects.

It is recommended that the City, through the Lake Norman Rural Planning Organization (LNRPO), actively coordinate with NCDOT in the evaluation of every resurfacing project for the potential of adding paved shoulders or bicycle lanes, and alert the affected neighborhood where the adding of such facilities is feasible and within the scope of a resurfacing project. The City should consider the opportunity to contribute to the cost of the project in order to provide paved shoulders or bicycle lanes consistent with an approved plan.

4. Grant and Project Participation Funding Preparation

Counties and municipalities are often unable to apply for grants or cost-sharing with NCDOT because of the short advance notice. But communities that budget a set-aside amount each fiscal year for the local match are thereby able to rapidly and more successfully respond to grant announcements. The City is encouraged to regularly set-aside funds to use as local match for relevant recreation, transportation and safety related grants and cost-sharing for enhancements to NCDOT projects. This strategy will minimize the opportunities lost for lack of a local match.

5. Coordinate with neighboring municipalities and surrounding counties.

The City can determine what happens within its corporate limits and extra-territorial jurisdiction, but not what happens outside its jurisdiction. Bicycle routes are often part of regional networks and, as such, require regional coordination. The Kings Mountain Bicycle Plan features seven routes or corridors that leave the City’s limits and ETJ. These routes enter either into the Cleveland or Gaston County jurisdictions, or the ETJs of Bessemer City or Gastonia. In some cases, Kings Mountain proposed projects connect with neighboring local or regional plans, such as the Bessemer City Furnace Trail, or the Carolina Thread Trail. Opportunities for implementing local plans can be strengthened through cooperative regional efforts.

Implementation Strategy:

1.) The KMBC should monitor regional trail efforts – particularly the Carolina Thread Trail – and assist City staff with grant application efforts.

2.) City staff and the KMBC should establish strong ties with similar interest groups and land development staff in neighboring jurisdictions. Monitor development of properties just outside the Kings Mountain ETJ to ensure that proposed off-road trail improvements are included in rezoning and permitting agreements.
4.6 Program Recommendations & Initiatives

FOSTERING A BICYCLE COMMUNITY

Bicycle facilities, old or new, will receive greater use if certain programs are in place to promote and encourage bicycling activity, especially for new cyclists. Many such programs are already in existence throughout the country. These programs and initiatives can help increase bicycle use and make it safer, and assist the City’s efforts to decrease traffic congestion, reduce the environmental impact of motor vehicles and support healthy lifestyles.

1. Wayfinding & Signage

Wayfinding signs are destination guide signs that help locate destinations such as civic and cultural buildings, commercial centers, historic landmarks, sport attractions, or a visitor center. Any level of bicyclist will feel more comfortable on a trip if they have a good idea of where they are at various points, and when they must turn to find their destination. In addition to the guidance they provide bicyclists, wayfinding signage can also serve to remind motorists that they share the road with bicyclists.

Signs must be clear, easy to find and read from a distance, aesthetically appropriate and have a uniform set of words/symbols on them to easily let the bicyclist (as well as motorists and pedestrians) know that they are on a bicycle route. G.S. 136-30 addresses signage on the state highway system. NCDOT does not currently allow wayfinding for bicyclists along NCDOT-maintained facilities.

Wayfinding signs should be located along designated bicycle routes and major bicycle corridors at decision points, such as major intersections.

The Federal Highway Administration’s (FHWA) Manual of Uniform Traffic Control Devices (MUTCD) defines nationwide standards used by road managers to install and maintain traffic control devices on all streets and highways. The FHWA recently updated the MUTCD in 2009. These updates allow way-finding signage for bicycle routes that show the direction arrow, destination and bike route delineation through an all in one sign as compared to the previous standard that separates these elements. Whichever sign standards are used for the Bicycle Route, they must be consistent, whether the roads are maintained by NCDOT, or by a municipality.

A useful complement to route signage is bicycle map brochure. These can provide information to guide novice cyclists to less-traveled routes and identify favorable routes for touring cyclists. Bicycle map brochures are a tool to promote alternative transportation or provide a guide to recreational opportunities.

For more information, see the NCDOT webpage:
http://www.ncdot.org/bikeped/projectdevelopment/signing_mapping/
2. Bicycle Safety Programs and Helmet Initiatives
Many cyclists, especially children, lack a basic safe bike handling skills. Bicyclists need to know their rights and responsibilities on the road. Additionally, bicyclists must be aware of the special hazards and know the skills necessary for safe cycling. The International Bicycle Fund (IBF) is an independent, non-profit organization offering many programs on bicycle education, enforcement and safety awareness. For more information, visit: http://www.ibike.org/education/safety-programs.htm.
Additional safety information is available through the DBPT website at: http://www.ncdot.gov/bikeped/safetyeducation/

3. Bicycle Rack Initiative
This Plan recommends bicycle racks at a number of strategic destination points throughout the City. For a complete listing of those locations, see Section 6.2 and refer to the Proposed Routes & Facilities Map in Section 7.

Increased availability of bike parking encourages the use of bicycles. A Bicycle Rack Initiative includes initial installation of bike racks (and lockers), a Request a Rack Program, and other complementary programs such as Ride & Play.

After the City initially installs bicycle racks, as recommended in the Bicycle Plan (See Section 4.2 Corridor Recommendations, Section 5.13 Facility Standards & Guidelines, and Section 7: Proposed Routes & Facilities Map) the Request a Rack Program allows commercial businesses, offices and industries without adequate bicycle parking to request a bike rack and installation at a shared cost with the City (or at no cost for non-profit organizations). Bicycle racks are installed at the request of the property owners. Requests are made using a form that includes information on Bicycle Rack Placement requirements and considerations.

A Ride & Play program rewards those who shop and visit area businesses on bike. By presenting a Ride and Play card on a cycle visit to participating businesses, cyclists can receive discounts and special services.

For sample forms and more information about bicycle rack initiatives, see: http://www.1800234ride.com/wpbtmi/bikeinitiative.html
NCDOT Division of Bicycle and Pedestrian Transportation (DBPT) website has many additional education, encouragement and enforcement program ideas and resources to help promote bicycling and educate drivers, pedestrians and cyclists on safe practices. Some of the initiatives featured at their website include:

- Bicycle Helmet Initiative
- Share the Road Initiative – including license plates and posters
- Information guidebooks and manuals for public education
- Safety education materials

See details at: [http://www.ncdot.org/bikeped/safetyeducation/](http://www.ncdot.org/bikeped/safetyeducation/)

**Bicycle Safety Enforcement**

Bicyclists share the full rights and responsibilities on the roadway as motor vehicle drivers and are subject to the same regulations. North Carolina traffic laws require bicyclists to:

- Ride on the right in the same direction as other traffic
- Obey all traffic signs and signals
- Use hand signals to communicate intended movements
- Equip their bicycles with a front lamp visible from 300 feet and a rear reflector that is visible from a distance of 200 feet when riding at night.
- Wear a bicycle helmet on public roads, public paths and public rights-of-way if the bicyclists is under 16 years old
- Secure child passengers in a child seat or bicycle trailer if under 40 pounds or 40 inches

For the complete set of North Carolina laws related to the operation of bicycles, plus other information on the rights of bicyclists on the road, and other guidelines, see [http://www.ncdot.gov/bikeped/lawspolicies/laws/](http://www.ncdot.gov/bikeped/lawspolicies/laws/)

**The League of American Bicyclists**

The League was founded in 1880 as the League of American Wheelmen. According to the League, bicyclists, known then as "wheelmen", were challenged by rutted roads of gravel and dirt and faced antagonism from horsemen, wagon drivers, and pedestrians. In their effort to improve riding conditions, more than 100,000 cyclists from across the United States joined the League to advocate for paved roads. The success of the League in its first advocacy efforts ultimately led to our national highway system.

Today the League offers a number of programs, including the Bicycle Friendly Community program (see: [http://www.bikeleague.org/programs/bicyclefriendlyamerica/communities/](http://www.bikeleague.org/programs/bicyclefriendlyamerica/communities/)), and numerous educational opportunities: [http://www.bikeleague.org/programs/education/](http://www.bikeleague.org/programs/education/)