

# Oak Ridge Streetscape Vision Plan

2019





# Oak Ridge Streetscape Vision Plan

*Crafting a Vibrant Community*



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## Acknowledgements

Thank you to the Stakeholder Committee and residents of Oak Ridge for their involvement and support in this planning process and commitment to streetscape improvements.

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## 1. Introduction and Project Overview

This chapter introduces the Town of Oak Ridge, provides a context for the Town of Oak Ridge Streetscape Vision Plan (plan), and discusses the benefits of installing streetscape elements and encouraging a walkable community.

### 1.1 Historical Background

Centuries before European settlers arrived, the abundance of game and the rich soil of the Oak Ridge area was a natural enticement for human habitation. Tradition holds (and archeological evidence shows) that the crest of the ridge, which runs some fifty miles from southwest to northeast near present-day Reidsville, was well used by Native Americans.

In 1755 the Earl of Granville granted Daniel Dillon a tract of 552 acres on Reedy Fork and Beaver Creeks in what was then northern Rowan County. The county later granted Dillon a license to build a grist mill in 1764. Rowan County court minutes from January 10, 1764, read: "Ordered that Daniel Dillon have License to Build a Publick Grist Mill on the Reedy Fork of Haw River at the mouth of Beaver Creek." The mill was located in what is now northwest Guilford County and confirms that a community already existed on land that is now part of the town of Oak Ridge.

Figure 1: Old Mill of Guilford



*This photo of the Old Mill of Guilford in the 1920s-1930s was taken before NC 68 was built. (Photo courtesy of Old Mill of Guilford)*

On February 10, 1781, during the Revolutionary War, British troops under the command of General Lord Charles Cornwallis marched past the mill. The 2,000-man force was in pursuit of American General Nathanael Greene whose Colonials were encamped at Guilford Courthouse. Local tradition has it that a band of Redcoat soldiers seized the mill to grind grain to feed their troops before the Battle of Guilford Courthouse on March 15, 1781.

Before the mid-nineteenth century, the predominantly Quaker community in Guilford County was largely isolated politically, culturally, and geographically from the plantation and slave-owning eastern regions of North Carolina that dominated the state legislature. The economic base of the county remained essentially unchanged until after the Civil War, and in many respects, it remained representative of the agrarian society of antebellum Piedmont North Carolina.

In the early 1820s, Quaker citizens of Oak Ridge established a nine-month school for boys in a one-room cabin. Thirty years later, on April 7, 1850, Charles Benbow, Jesse Benbow, Thomas Benbow, and Allen Lowery convened a community meeting of their neighbors, and the group agreed to build a larger schoolhouse. They raised a total of \$629 and appointed five trustees to oversee construction of the new building.

Oak Ridge Male Institute was conceived as "a school of high classical standing" and was built on land donated by Lowery. It was located on a knoll along a former colonial route referred to as the Danville-Salisbury Stagecoach Road. That road is now known as Oak Ridge Road or NC 150. The first academic year was 1852. Within two years the name was changed to Oak Ridge Institute and females were admitted.

The Institute was devastated by the Civil War. Most of the male students, probably about one hundred young men and boys, either enlisted or were conscripted into various Confederate Army units along with their professors. It is believed many of the students died at Gettysburg, July 1-3, 1863, and the school was closed during the last two years of the war.

John Allen Holt took over management of the Institute as Senior Principal in 1875 and was joined by his brother Martin H. Holt as junior principal in 1879. The Holt brothers were university educated Institute graduates, and

under their leadership, the school entered a golden age. Together they served the Institute for forty years.

In 1914, Thomas Early Whitaker took over management of the Institute, along with his son, Zack L. Whitaker. With the entry of the United States into World War I in 1917, Oak Ridge became a military training school under the supervision of the United States War Department. The boys were in school uniforms for the first time, and in 1929 the school name was changed to Oak Ridge Military Institute, accepting only male students. A two-year junior college was established in 1932 and continued until 1966.

In 1945, a group of local citizens headed by Frank Linville, Charlie Oakley, Lan Donnell, and Lan Blaylock discussed how to finance the building of a new Methodist church in Oak Ridge. The decision was made to stage a horse show as a fundraiser over Easter weekend. For the next seven years all proceeds went to the Methodist church, and by then the Oak Ridge Easter Horse Show was the largest horse show in the state of North Carolina. A Fiddlers' Convention was later added which drew musicians, singers, and fans from across North Carolina and many surrounding states, and the event became as much a social affair as a horse show.

The importance of the Horse Show cannot be overstated. Over the years it raised hundreds of thousands of dollars for civic causes in Oak Ridge. After the church was built, proceeds were used to build a new gymnasium and two lighted baseball/softball fields at Oak Ridge Elementary School and to help finance the Oak Ridge Fire Department, Oak Ridge Ladies Fire Auxiliary, and the Oak Ridge School PTA for decades. The Show took place annually for 68 years, but due to a lack of adequate facilities in the area, it has not been staged since 2012.

Most of the military schools in the United States closed during the Vietnam War years. To save the Institute, the trustees restructured it as a secondary school in 1966. Girls were admitted once again in 1971 making Oak Ridge the first co-ed military school in the world, and it was renamed Oak Ridge Academy. The school remained a military school, however, and "Military" was added back to the name in 1981. In 1983 Oak Ridge Military Academy became a National Historic District, and in 1991 the Academy was recognized by the North Carolina State Legislature as the Official Military Academy of North Carolina.

For over two centuries, the business and social affairs of Oak Ridge centered on the farm and such institutions of the rural lifestyle as the

general store and the local gristmill. The intersection of NC 68 and NC 150 was a rural crossroads with a four-way stop, flanked by two tobacco fields and a military school. Moreover, the community was locked in a symbiotic relationship with the school that bore its name. Small towns and private military schools were in decline, and it is unlikely either school or community would have survived the 1950s and 1960s without the other. The Academy survived, largely due to its wonderful location, and the town survived because the school was there.

Figure 2: Alumni Hall



Alumni Hall at Oak Ridge Military Academy. (Photo courtesy of Sandra Smith)

Evidence of the small farming community can still be found at the intersection of present-day Linville Road and Oak Ridge Road. Here, at the heart of the old community, are the venerable Oak Ridge Elementary School (erected in 1924), buildings that once housed a small grocery store and filling station (1951), and nearby farmhouses: the Jesse Benbow house (c. 1823), the Charles Benbow house (c. 1858), and the Saunders-Blaylock house (c. 1815). Daniel Dillon's mill (now called The Old Mill of Guilford) is located a short distance south of the Historic District on NC 68 and is one of the oldest mills still operating commercially in the United States.

The Oak Ridge community was incorporated in 1998, and although there has been substantial population growth, much of the residential area neighboring the Academy retains its small-town charm. The Oak Ridge Historic Preservation Commission, through the creation of the Oak Ridge

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Historic District, has promoted the restoration and preservation of historic structures within the town limits and has helped manage the growth.

As the community enters its third decade as an incorporated entity, Oak Ridge remains surrounded by farmland that has been continuously tilled since the area was first settled by Quaker families nearly 300 years ago. In the 21st Century, the town is a cherished blend of old and new, treasuring its past while looking to the future and seeking the best path to get there.

*Credit: Gary & Myra Blackburn, 2019*

## **1.2 Benefits of Streetscape Improvements**

The benefits of a streetscape plan can help transform a municipality in ways other than an attractive street. When implemented, these plans can increase the economic viability of a community, pedestrian activity, tourism, and safety.

Traffic flow can change the way people perceive downtowns, a street can be engineered to slow vehicular traffic down, encouraging drivers to notice storefronts and shopping opportunities while allowing pedestrians and cyclists to feel safe. Downtowns or town cores can be considered a “third” space for visitors. It compliments a home or neighborhood as well as the workplace. A well-designed streetscape becomes an amenity area and an attractive shopping venue for the surrounding neighborhoods. Sidewalks, bike lanes, and bike racks encourage people to travel downtown without their car. This promotes local neighborhoods to frequent downtown and increases the amount of parking available for those coming in personal automobiles.

Tourists are often attracted to a town core through street festivals, farmers markets, and auto shows. Historic walks and districts can promote additional tourism to downtowns. Attractions, both natural and human-made, should be promoted to attract tourism. Streetscape plans accomplish this using wayfinding signs and façade improvements. Tourism relies on complete infrastructure to house, feed, and entertain the tourism industry.

A community that does not make people feel safe will have reduced walkability and an increased perception of crime. An area with high walkability improves safety and decreases crime. Walkability, measured by the street and sidewalk width, vehicle speed, crosswalks, street trees, and public street furniture, is an emerging topic in community resilience.

Trees can encourage vibrant spaces to sit and visit, or people watch, bringing more pedestrians downtown to a safer space. An active streetscape design encourages “eyes on the street,” a design technique used to promote many peoples active line of site on the street. These opportunities encourage increased visibility and activity discouraging violent crime.

A streetscape plan allows for a well-designed and measured strategy to be implemented. These vibrant places encourage a sense of belonging and pride for a community, bringing more pedestrians and locals downtown. Streetscapes improve the mix and vitality of downtown and are successful because of long-term, strategic, tactical growth, and management.

## **1.3 Public Involvement**

Public involvement was critical to the development of the Plan to reflect the streetscape vision of Oak Ridge. The planning effort was led by Piedmont Triad Regional Council staff with input from the Streetscape Vision Stakeholders, Town of Oak Ridge staff, and the community through public open houses and two surveys. Surveys assessing needs and visual preferences were essential in receiving feedback from residents, business owners, employees, and visitors to the Town of Oak Ridge. Two surveys were shared with the community via email, Facebook, local events, and word of mouth.

The first survey “Town of Oak Ridge - Streetscape Survey” acted as an overview, identifying what issues are important to the community, where trouble areas are for pedestrians and cyclists, and how the public sees the future and current state of the Town. PTRC staff also took advantage of local events to interact with community members at the Classic Car Cruise-In on May 16, 2018, as well as RidgeFest on June 1 and 2, 2018. The survey had 253 total responses with an 81% completion rate. A large map of the town core was made available to draw areas where community members visit, walk, cycle, or have concerns about walking or cycling. This map was used in the planning process to ensure safety concerns and heavily traveled areas of the town core were addressed.

The second survey distributed “Oak Ridge Town Core - Visual Preference” asked community members to provide input on the design of streetscape amenities they would like to see in the town core. The options provided different colors, styles, and materials. The survey had 144 responses with

a 79% completion rate. The rankings and comments were sorted and ordered from highest rated and can be found in the Appendix and Streetscape Elements sections. The Streetscape Vision Stakeholders

## 2. Existing Conditions

### 2.1 Population Demographics

Oak Ridge became an incorporated municipality in 1998. In the year 2000, the population was 3,988. By the year 2010, the population had increased 55% to 6,185 residents. By 2016, the population increased another 17% to 7,209 residents, making it the fourth largest municipality in Guilford County, and the 108th largest in North Carolina. The land area of Oak Ridge is just over 16 square miles. The population density is only 442 people per square mile (or 0.69 people per acre), ranking 399th for density in North Carolina out of 553 municipalities.

Oak Ridge is a wealthy bedroom community in the Piedmont Triad where most residents work in neighboring urban areas. The median household income in Oak Ridge (\$109,509) is more than double that of the State (\$48,256).

Table 1: Demographic Overview

Characteristic:	2000	2016
Population	3,988	7,209
Land Area (Square Miles)	14.7	16.3
Population Density (Per Square Mile)	272	442
Median Age	37.7	44.7
Percent Minority	7%	21%
Average Household Size	2.89	2.91
Homeownership Rate	92%	90%
Median Household Income	\$74,609	\$109,509
Poverty Rate	3.8%	3.3%
Mean Travel Time to Work (Minutes)	25.8	25.9

Source: 2000 Decennial Census; 2012-2016 ACS; NC OSBM 2016 Municipal Population Estimates

reviewed survey results, clarified results, and helped to ensure draft documents met the needs of the community.

When compared to other bedroom communities in the region, Oak Ridge's growth has exceeded all of the comparison areas in the last decade. The proximity of Oak Ridge within the Piedmont Triad region, will only encourage continued growth in Oak Ridge.

Table 2: Historical Population

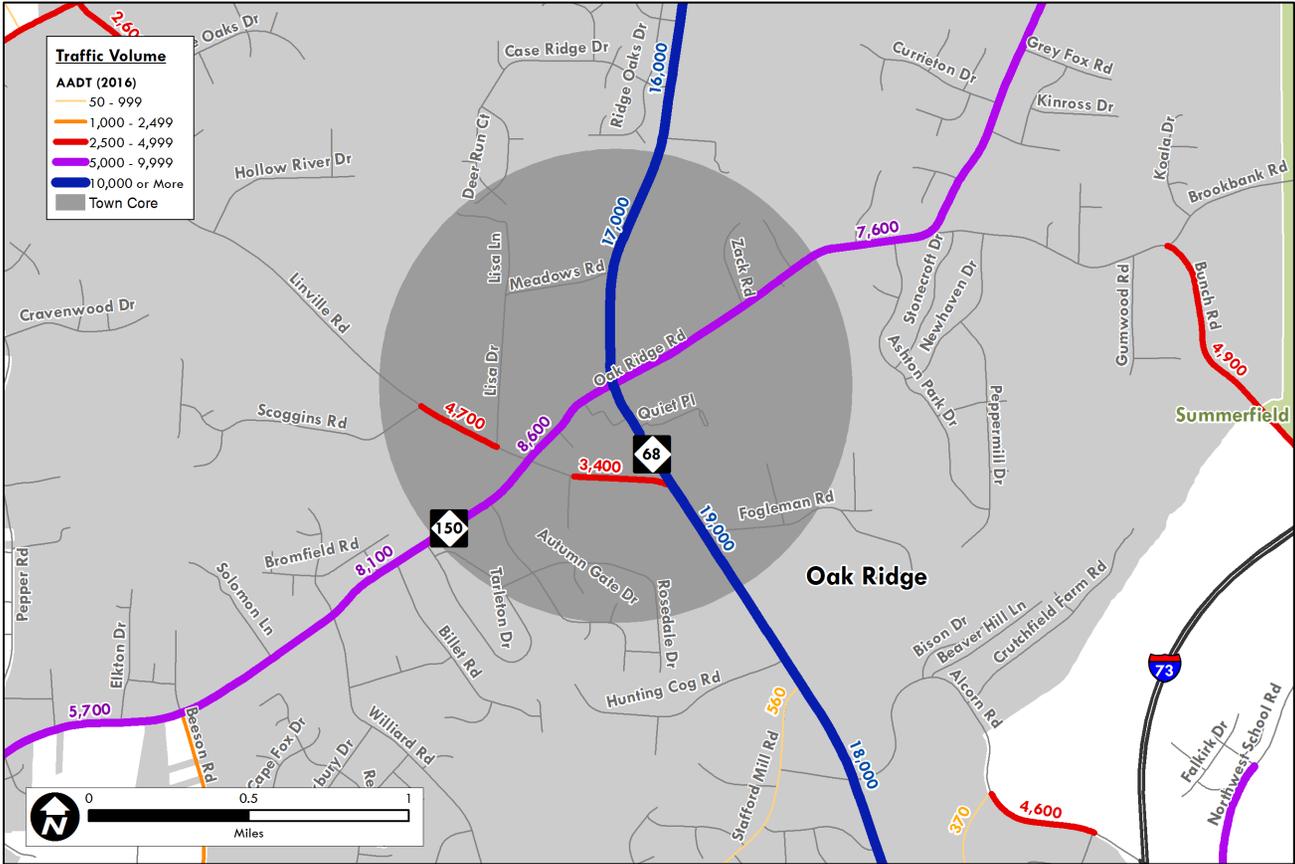
Jurisdiction	1970	1980	1990	2000	2010	2016
Oak Ridge	-	-	-	3,988	6,185	7,209
Clemmons	-	4,842	6,020	13,827	18,627	19,605
Elon	2,150	2,873	4,448	6,748	9,419	10,532
Jamestown	1,297	2,148	2,662	3,088	3,382	3,642
Rural Hall	1,289	1,336	1,652	2,464	2,937	3,100
Stokesdale	-	-	2,134	3,267	5,047	5,604

Source: U.S. Census Bureau, Decennial Census; N.C. Office of Budget & Management, 2016 Population Estimates

### 2.2 Traffic Volumes

The majority of travel through Oak Ridge occurs on NC Highway 68 with about 19,000 average trips per day in 2016. With the opening of I-73 just south of Oak Ridge, traffic volume on NC-68 through Oak Ridge has declined slightly. Roughly 8,600 vehicles per day also travel along NC-150 running east to west through the Town, making the intersection of NC-68 and NC-150 highly traveled.

Figure 3: Traffic Volumes (2016)



Source: NCDOT Average Annual Daily Traffic, 2016

### 2.3 Vehicle Crashes

For the five year period between 2013 and 2017, the highest ranking intersection for crashes is NC 68 and NC 150 as shown in Table 3. In addition, most crashes within Oak Ridge are rear-end collisions which also cause the most injuries and property damage as shown in Table 4. The data also shows that crashes involving pedestrians and bicyclists are 0.3 percent of all reported crashes in Oak Ridge during this period.

Table 3: High Accident Intersections (2013-2017)\*

Rank	Number of Crashes	Road A	Road B
1	43	NC 68	NC 150
2	12	NC 68	E. Harrell Rd.
3	11	NC 150	Linville Rd.
4	11	NC 68	Alcorn Rd.
5	11	NC 68	Hunting Cog Rd.
6	8	NC 150	Autumn Gate Dr.
7	7	NC 68	Linville Rd.
8	6	NC 150	Beeson Rd.
9	6	NC 68	Meadows Rd.
10	5	NC 150	Bunch Rd.

*\*Please note that this is preliminary summary data and should not be used for detailed site-specific analysis or as an indication of danger or risk.*

Source (both tables): NCDOT Traffic Engineering Accident Analysis System (TEAAS)

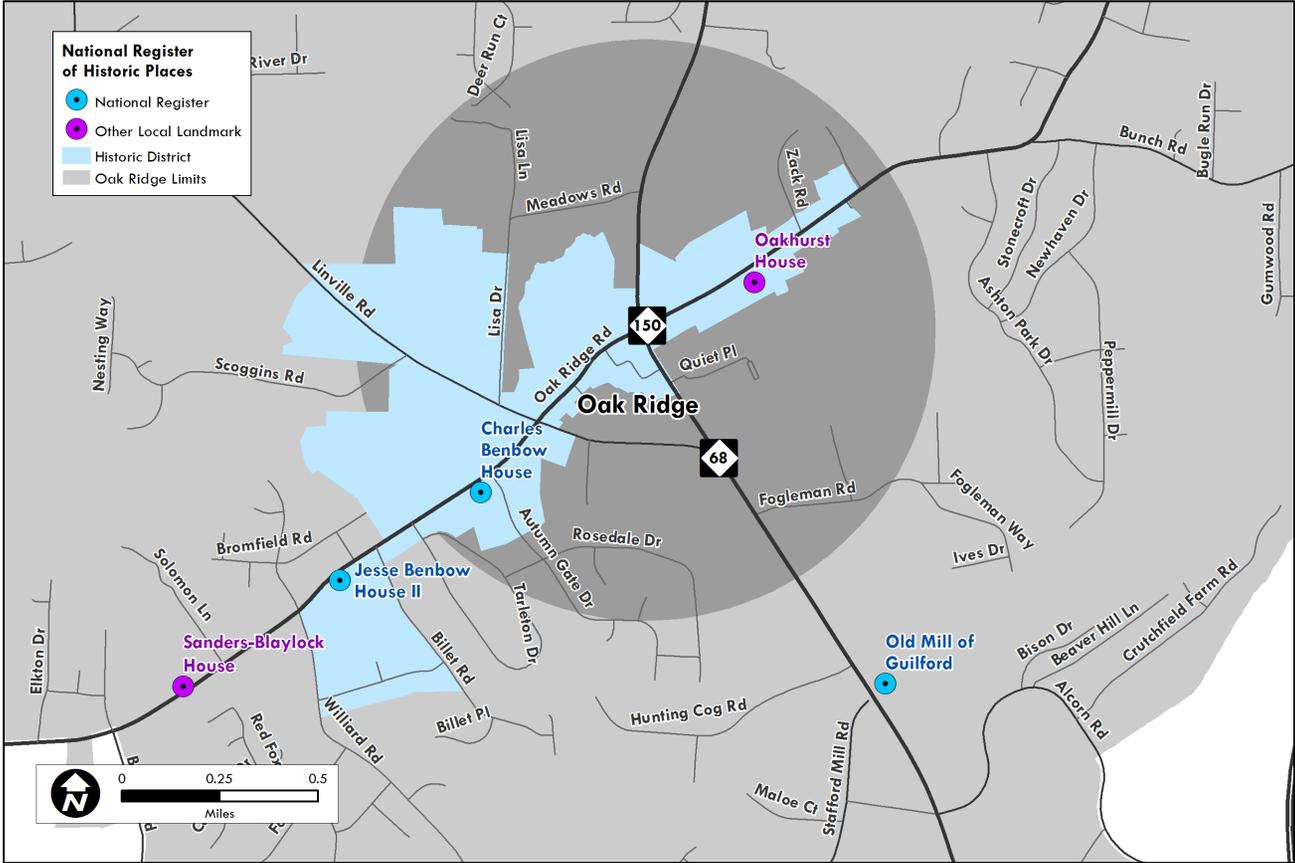
Table 4: High Accident Intersections (2013-2017)\*

Accident Type	Number of Crashes	Percent	Total Injuries	Total No Injuries	Total Property Damage
Rear End, Slow Or Stop	201	29.96	81	469	\$1,071,675
Fixed Object	121	18.03	32	125	\$618,400
Animal	65	9.69	1	86	\$159,851
Left Turn, Different Roadways	53	7.9	29	110	\$328,900
Backing Up	47	7	5	119	\$103,400
Angle	32	4.77	19	80	\$266,725
Parked Motor Vehicle	31	4.62	2	79	\$72,600
Left Turn, Same Roadway	21	3.13	11	42	\$155,100
Sideswipe, Same Direction	16	2.38	2	88	\$58,700
Sideswipe, Opposite Direction	16	2.38	11	32	\$76,850
Movable Object	12	1.79	1	12	\$29,950
Right Turn, Different Roadways	12	1.79	1	30	\$64,700
Ran Off Road - Right	11	1.64	1	17	\$34,400
Overturn/Rollover	8	1.19	4	9	\$53,000
Other Collision With Vehicle	7	1.04	4	15	\$48,400
Head On	4	0.6	4	5	\$56,150
Rear End, Turn	3	0.45	1	10	\$18,500
Right Turn, Same Roadway	3	0.45	0	6	\$22,000
Other Non-Collision	2	0.3	0	2	\$4,400
Pedestrian	2	0.3	2	2	\$150
Pedalcyclist	2	0.3	2	3	\$4,700
Ran Off Road - Left	1	0.15	0	1	\$2,200
Ran Off Road - Straight	1	0.15	0	2	\$5,500
<b>Totals</b>	<b>671</b>	<b>100</b>	<b>213</b>	<b>1,344</b>	<b>\$3,256,251</b>

2.4 Historic Properties

The Town has several historical properties of which three are listed in the National Register of Historic Places and two identified as local landmarks. Oak Ridge also contains a historic district (shaded in light blue in the map below) which encompasses the campus of the Oak Ridge Military Academy and includes other properties such as Oak Ridge Elementary.

Figure 4: Historic Places in the Town Core



Source: NC Historic Preservation Office

2.5 Architectural Elements

A visual survey of Oak Ridge indicates that the town has a unique visual language that should be referenced when considering future streetscape element designs. A sample of these architectural elements is shown below.

Figure 5: Existing Architectural Elements Within Oak Ridge



Source: PTRC











## 2.6 Overview of Primary Corridors

### North – NC Highway 68

#### NC 150 (Oak Ridge Rd.) to Kelly Ford Rd. (~0.8 miles)

##### Existing Conditions

Land uses within the corridor include commercial, residential, office, institutional, and some agricultural. This corridor also contains areas of forested land that remains largely undeveloped. North NC 68 is a two-lane, divided and undivided, road with a posted speed limit of 45 mph to 50 mph and serves as an important route for north-bound traffic through Oak Ridge. The existing right-of-way is approximately 60 feet, and the pavement width is approximately 27-46 feet. According to 2016 traffic counts by NCDOT, the average daily traffic is 17,000 although more recent counts suggest that this number has decreased slightly due to the opening of Interstate 73. The corridor also contains 917 feet of concrete sidewalks.

##### Opportunities

- Safe connectivity of residential areas with commercial and office areas.
- Existing streetscape aesthetics due to the availability of existing trees along Oak Ridge Military Academy property.
- Opportunity to showcase the village character of Oak Ridge.

##### Constraints

- The increased danger for non-motorized roadway users due to high traffic volume and speeds.
- Unsafe intersections and driveways and access management for pedestrian travel between the Oak Ridge Military Academy and the commercial shopping center.
- Terrain and right-of-way challenges that may increase engineering, utilities, and construction costs of streetscape elements and infrastructure.

##### Points of Interest

Allen Tate Realtors, Bank of Oak Ridge, Central Baptist Church, Creekstone Neighborhood, Oak Ridge Commons Shopping Center, Oak Ridge Military Academy.

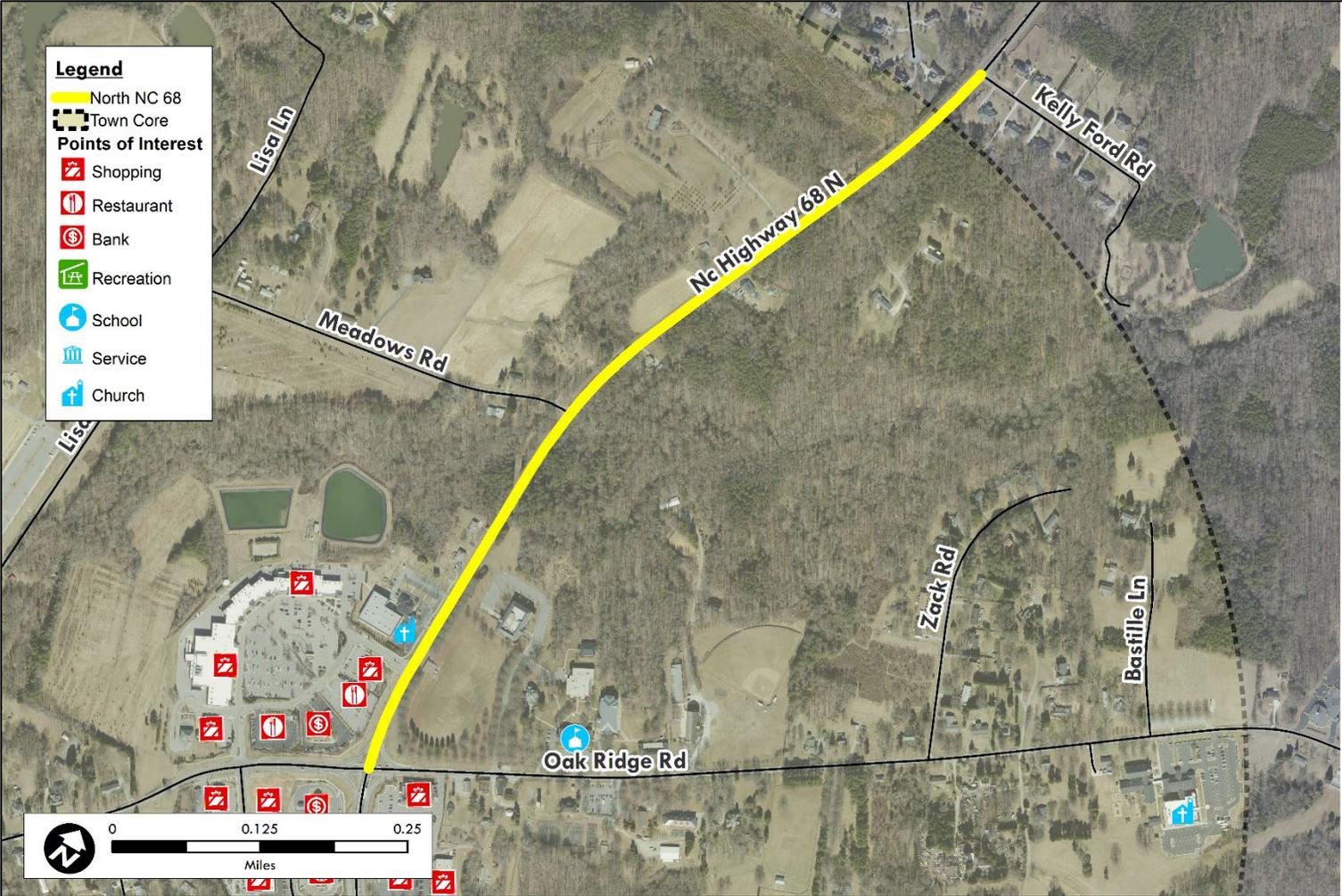
Eastside of NC 68 looking south near Kelly Ford Rd.



Westside of NC 68 looking north near Central Baptist Church



Figure 6: North NC Highway 68



Source: PTRC

## South – NC Highway 68

### Fogleman Rd. (SR 2129) to NC 150 (Oak Ridge Rd.) (~0.6 miles)

#### Existing Conditions

Land uses within the corridor include commercial, residential, and office. This corridor also contains areas of land that remains largely undeveloped. South NC 68 is a two-lane, divided and undivided, road with a posted speed limit of 45 mph to 50 mph and serves as an important route for south-bound traffic through Oak Ridge. The existing right-of-way is approximately 60 feet, and the pavement width is approximately 22-33 feet. According to 2016 traffic counts by NCDOT, the average daily traffic is 19,000 although more recent counts suggest that this number has decreased slightly due to the opening of Interstate 73. The corridor also contains 1,436 feet of concrete sidewalks.

#### Opportunities

- Safe connectivity of residential areas with commercial and office areas.
- Strong visual aesthetics in new commercial buildings.
- Existing streetscape elements and pedestrian infrastructure due to recent commercial development.
- Opportunity to showcase the rural character of Oak Ridge in the southern portion of the corridor.

#### Constraints

- The increased danger for non-motorized roadway users due to high traffic volume and speeds.
- Terrain and right-of-way challenges that may increase engineering and construction costs of streetscape elements and infrastructure.
- Existing utilities.

#### Points of Interest

Bank of Oak Ridge, Bill's Pizza Pub, BB&T, Bojangles', Carolina Priority Care, CVS Pharmacy, Devaney Dentistry, Eagle Physicians, LeBauer HealthCare, McDonald's, Shell Gas Station, Snap Fitness, Village Woods Townhomes.

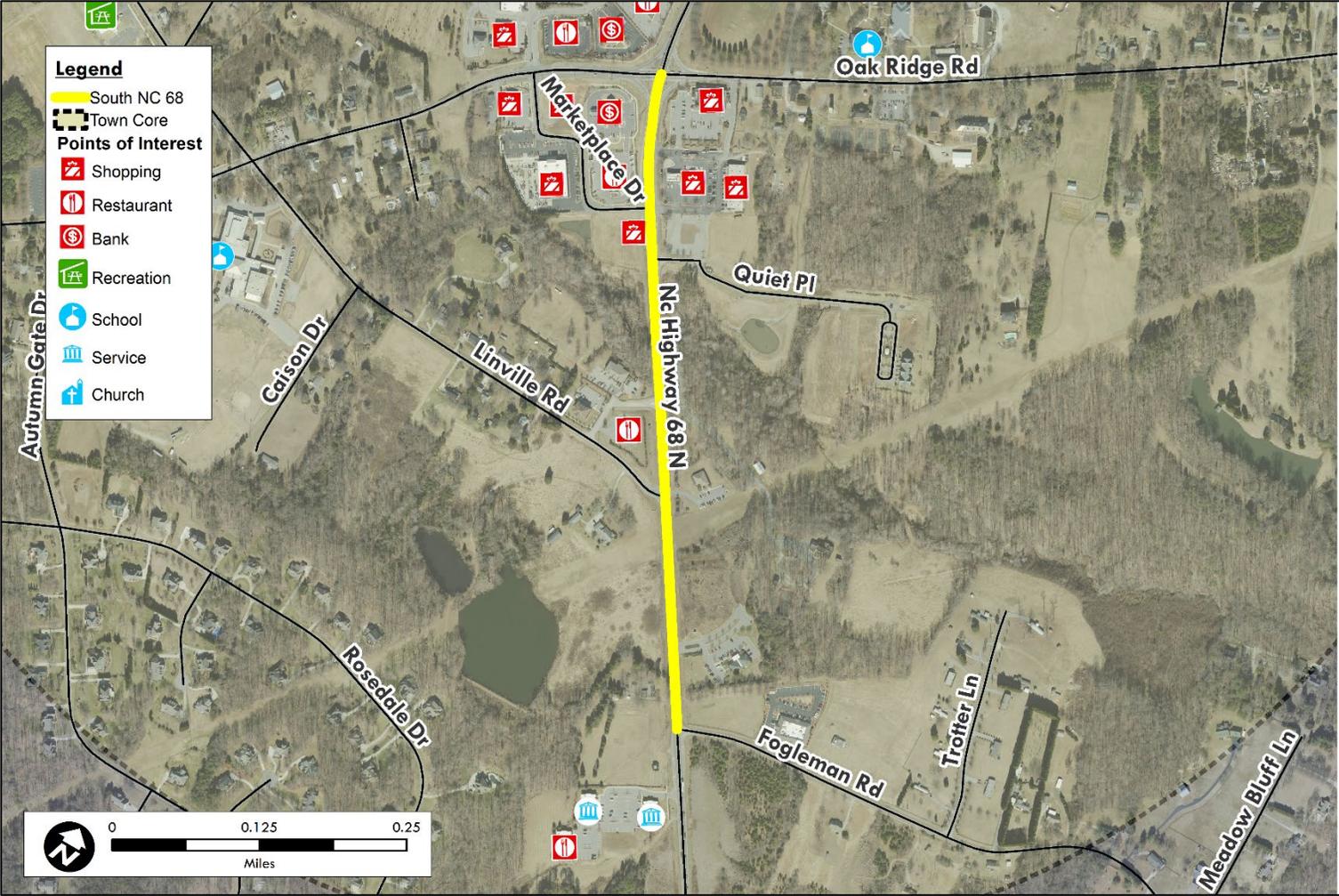
Westside of NC 68 looking north near Fogleman Rd.



Eastside of NC 68 looking north near Quiet Pl.



Figure 7: South NC Highway 68



Source: PTRC

## East – NC Highway 150

### NC 150 (Oak Ridge Rd.) to Bastille Ln. (~0.7 miles)

#### Existing Conditions

Land uses within the corridor include institutional, residential, and commercial. This corridor is the most historic in Oak Ridge. East NC 150 is a two-lane, undivided, road with a posted speed limit of 35 mph and serves as an important route for east-bound traffic through Oak Ridge. The existing right-of-way is approximately 60 feet, and the pavement width is approximately 22-33 feet. According to 2016 traffic counts by NCDOT, the average daily traffic is 7,600 although more recent counts suggest that this number has decreased slightly due to the opening of Interstate 73. The corridor also contains 324 feet of concrete sidewalks.

#### Opportunities

- Safe connectivity of residential areas with institutional and commercial areas.
- Level topography and available right-of-way along roadways for future pedestrian facilities.
- Strong visual aesthetics from historical buildings.
- Some existing streetscape elements due to the pedestrian activity generated by the Oak Ridge Military Academy.

#### Constraints

- The increased danger for non-motorized roadway users due to high traffic volume and speeds.
- Historic nature of the corridor may be a barrier to implementing some improvements.
- Existing utilities.

#### Points of Interest

CVS Pharmacy, Donnell Rock House, J.L. Sawyer House, Linville Chapel, R.P. Larkins House, Oakhurst House, Oak Ridge United Methodist Church, Zack L. Whitaker House.

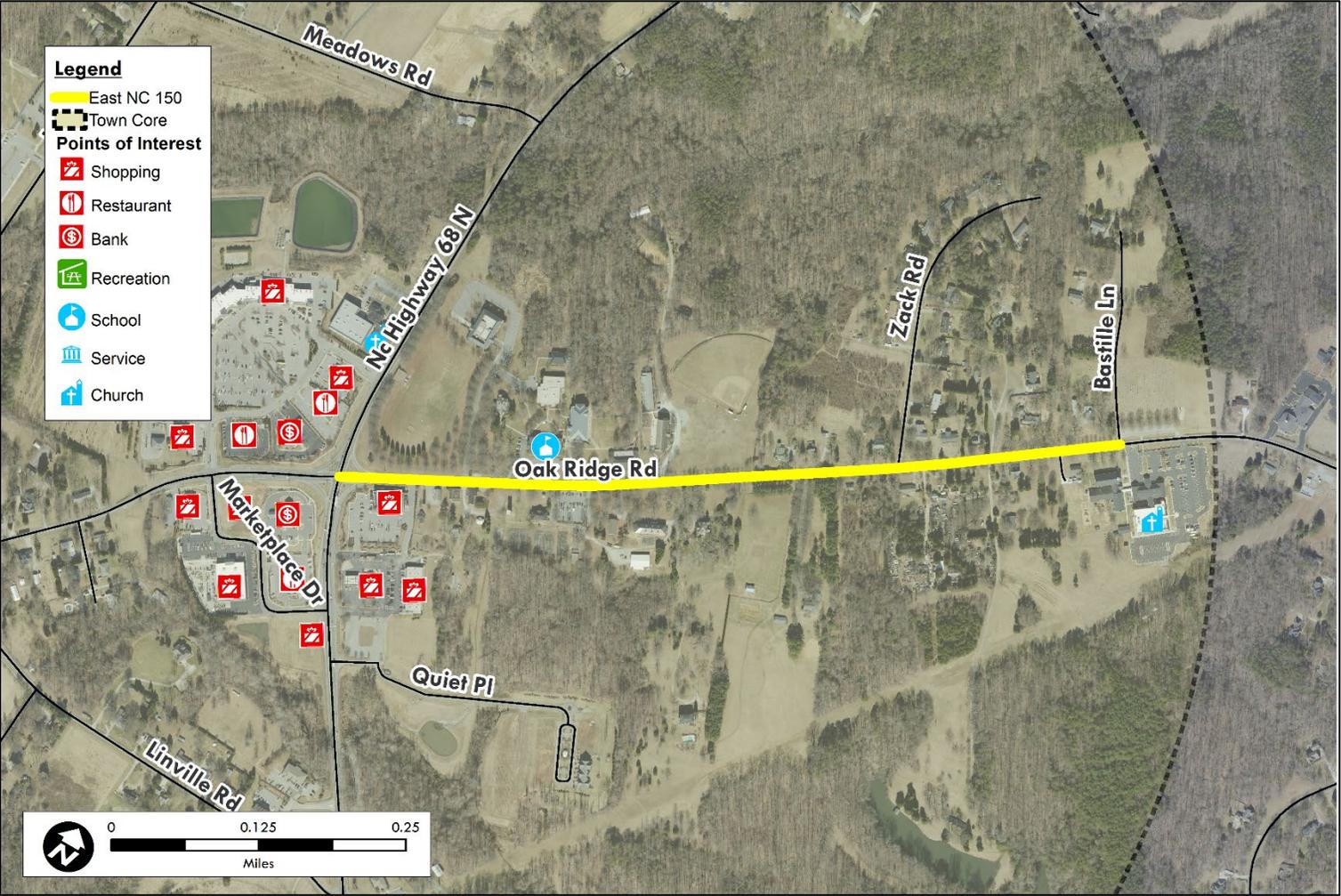
Northside of NC 150 looking west near Zack Rd.



Southside NC 150 looking west towards NC 68.



Figure 8: East NC Highway 150



Source: PTRC

## West – NC Highway 150

### NC 150 (Oak Ridge Rd.) to Tarleton Dr. (~0.8 miles)

#### Existing Conditions

Land uses within the corridor include institutional, residential, and commercial. West NC 150 is a two-lane, undivided, road with a posted speed limit of 45 mph and serves as an important route for west-bound traffic through Oak Ridge. The existing right-of-way is approximately 60 feet, and the pavement width is approximately 22-33 feet. According to 2016 traffic counts by NCDOT, the average daily traffic is 8,100 although more recent counts suggest that this number has changed slightly due to the opening of Interstate 73. The corridor also contains 1,994 feet of concrete sidewalks.

#### Opportunities

- Safe connectivity of residential areas with institutional and commercial areas.
- Level topography and available right-of-way along roadways for future pedestrian facilities.
- Some existing streetscape elements starting around Oak Ridge Elementary School and the NC 68 commercial district.
- Development of town-owned property with road frontage that is adjacent to Oak Ridge Swim Club.

#### Constraints

- The increased danger for non-motorized roadway users due to high traffic volume and speeds.
- Existing utilities.

#### Points of Interest

ABC Store, Bank of Oak Ridge, BB&T, Charles Benbow House, David B. Stafford House, Oak Ridge Commons Shopping Center, Oak Ridge Elementary School, Oak Ridge Swim Club, Prestige Car Wash, Sherwin-Williams Paint, Stafford-Benbow House, NC SECU, Tractor Supply Co., Valvoline Express Care, Wendy's.

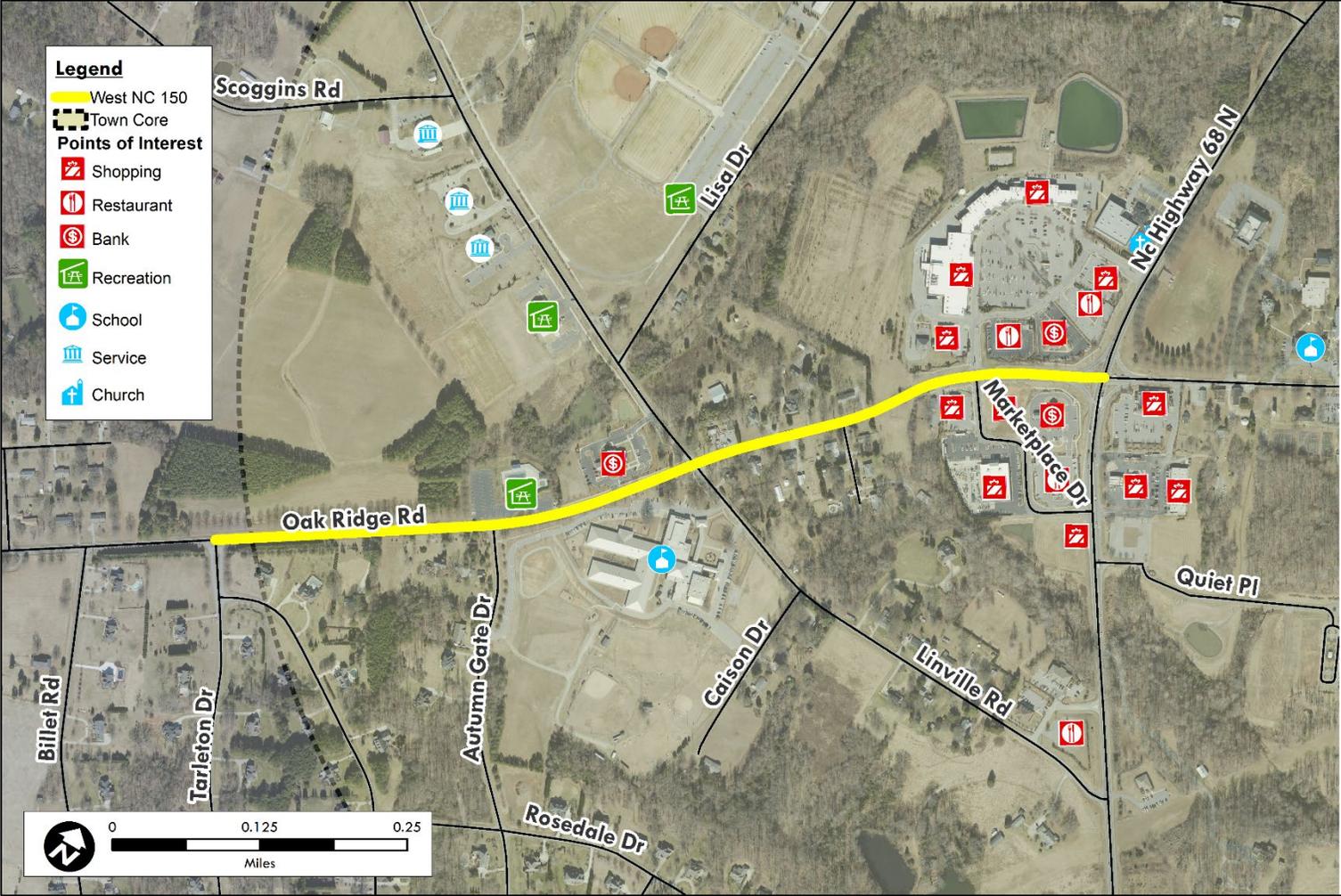
Southside of NC 150 looking east near Tarleton Dr.



Northside of NC 150 looking east towards Linville Rd.



Figure 9: East NC Highway 150

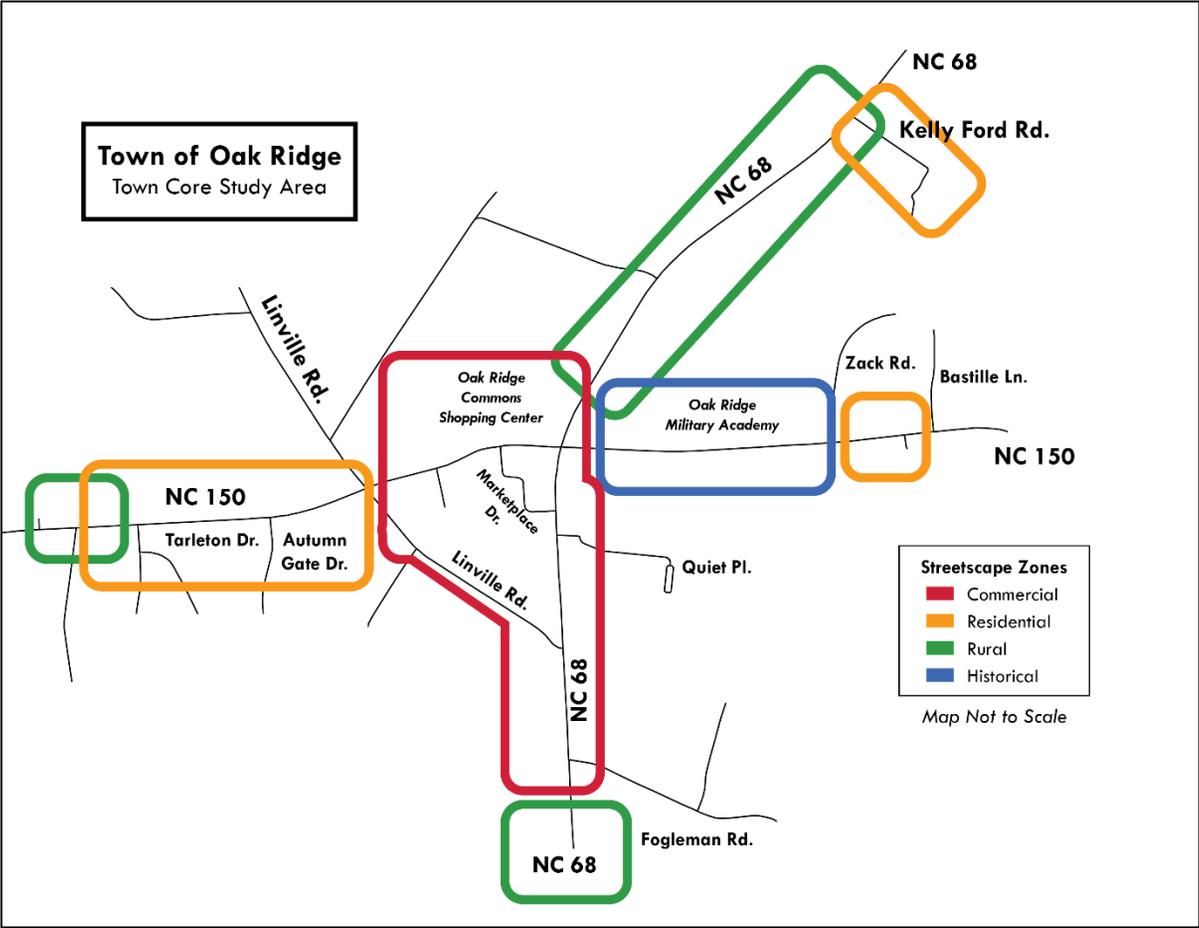


Source: PTRC

Streetscape Zones

Through a fieldwork and mapping analysis, it has been determined that Oak Ridge’s Town Core has four (4) different potential streetscape zones (in no particular order): Commercial, Residential, Rural, and Historical. These labels were selected based on adjacent land use, topography, and future opportunities for town growth. The approximate location of each type is shown in the diagram below. Transition areas are places where zones overlap. Additional discussion about each type can be found in section 3.3.

Figure 10: Streetscape Zone Overview Diagram



2.7 Relevant Plans & Policies

2018-2027 State Transportation Improvement Program (STIP)

The following STIP projects are found within the Town of Oak Ridge and may have an impact on the streetscape along NC 68 and NC 150 corridors in the Town Core:

- R-5725 – Improvements at the intersection of NC 68 and NC 150.
- U-6012 – Secondary Road 2129 (Fogleman Road) to NC 150 in Oak Ridge. Access management and safety enhancements.

WalkBike NC

WalkBikeNC, North Carolina’s Bicycle, and Pedestrian Plan, was adopted by the NCDOT Board of Transportation in December 2013. The adoption concluded an 18-month planning process that included comprehensive stakeholder and public engagement across the entire State. The Plan lays out a framework for improving bicycle and pedestrian transportation as a means to enhance mobility, safety, personal health, the economy, and the environment.

2040 Metropolitan Transportation Plan (MTP)

The 2040 Metropolitan Transportation Plan (MTP) addresses surface transportation, including highways, railways, public transit, bicycling, and pedestrians, as well as intermodal connections and connections to aviation. It covers the Greensboro Metropolitan Area including the City of Greensboro, the Towns of Pleasant Garden, Oak Ridge, Sedalia, Stokesdale, Summerfield, and much of unincorporated Guilford County. The plan provides an assessment of future area transportation needs, issues, and recommendations, along with future transportation investment recommendations.

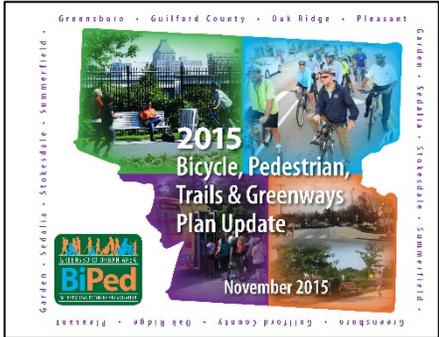
The plan was adopted by the Greensboro Urban Area Metropolitan Planning Organization (MPO) in September 2015



and most recently amended in May 2018. The document serves as a resource for area local governments and the North Carolina Department of Transportation (NCDOT).

Greensboro Urban Area BiPed Plan Update

The 2015 Bicycle, Pedestrian, and Greenways Master Plan (BiPed) Update refine and expands the original 2006 BiPed Plan. The plan addresses the immediate and long-term needs for bicycling and walking in the Greensboro MPO Area by identifying recommended future bicycle, pedestrian, trail and greenway facility improvements, policy and program enhancements, operations and maintenance activities, and implementation steps. Both the MPO Transportation Advisory Committee (TAC) and the Greensboro City Council have adopted the BiPed Plan Update.



The 2015 BiPed Plan Update conforms to the findings and policy direction of the 2040 Metropolitan Transportation Plan (MTP), which provides a vision for

future transportation improvements in the Greensboro MPO Area. The BiPed Plan Update also incorporates the recommendations and findings of bicycle and pedestrian plans of local MPO municipalities, including the Town of Oak Ridge's Comprehensive Pedestrian Transportation Plan and the Town of Pleasant Garden's Comprehensive Bicycle and Pedestrian Transportation Plan.

Greensboro Urban Area MPO Complete Streets Policy

As the first step toward implementing the BiPed Plan Update, the Greensboro Urban Area MPO Transportation Advisory Committee (TAC) adopted a Complete Streets Policy for the MPO. This document establishes a complete streets policy to reflect its commitment to creating a balanced multimodal transportation system, improving pedestrian and bicycle safety, and improving accessibility. This policy is essential to realizing the vision statement of the Metropolitan Transportation Plan Vision:

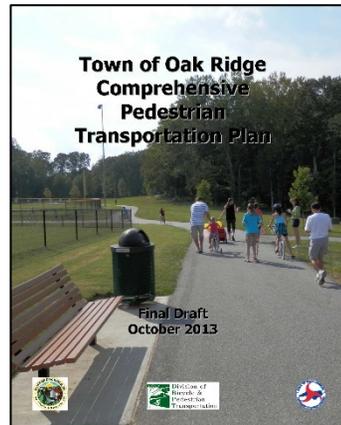
“To develop and maintain a safe, efficient, and environmentally compatible transportation system that provides convenient choices for accessing destinations throughout the Greensboro Metropolitan Area and the Triad, including well-integrated, connected public transportation, pedestrian, and bicycle networks.”

**Oak Ridge Comprehensive Pedestrian Transportation Plan**

This document, adopted in 2013, outlines a strategy for enhancing the walkability of the town. This plan looks ahead 20 years, describing projects, policies, and programs that achieve the vision of a safe, connected and accessible pedestrian system for all Oak Ridge residents. Specific objectives are outlined to encourage daily physical activity, create safe walking in the Town Core area and connect parks and open space to residential neighborhoods via trails and sidewalks. Small, but continued

investments in bicycle and pedestrian transportation can provide dividends to the community through increased transportation options, improved safety, and quality of life enhancements.

Recommended projects in this plan include sidewalks, trails, paved shoulder and intersection treatments (e.g., refuge islands, crosswalks, and pedestrian signal installations). This plan also recommended “the NC 150 and NC 68 corridor should be studied and reviewed for Streetscape Enhancement, and a Complete Street cross section adopted for the two roads through the Town Core. Consider a conditional use district along the corridors to ensure compatible land use and development compatible with the Streetscape Enhancement.”



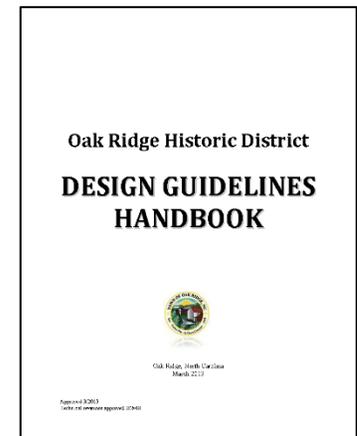
**Oak Ridge Historic District Design Guidelines Handbook**

Initially adopted in 2005 and amended as recently as 2018, this document describes Oak Ridge’s history, the current historic district, the function of the Oak Ridge Historic District Commission, and the required Certificate of Appropriateness. Most importantly, this document also describes the Historic District design guidelines for new construction, existing structures, and relocation or demolition of structures. Relevant to the streetscape

design in Oak Ridge is “Section B. Existing and New Structures: Site Features and District Character” starting on page 33. This section presents guidelines regarding signage, landscaping, parking, fences and walls, lighting, and utilities.

The plan also contains the following statements relevant to streetscape design:

- “One of the most significant landscape characteristics of the Oak Ridge Historic District is the large amount of open farm and pasture land. Since this open land may eventually be developed, the landscape guidelines will play an important role in mitigating and harmonizing the effects of new structures and parking lots” (p. 35).
- “Incorporate existing trees, shrubs and historic landscape features into the landscape plan for new construction” (p. 38). “Sidewalks should be planned and installed in a manner which preserves the surrounding trees/landscaping, etc.” (p. 38).
- “The visual integrity of the Oak Ridge Historic District can be preserved and enhanced by thoughtful attention given to the design of site access and parking provisions. Besides the buildings themselves, these two features are most important in shaping the character of the Historic District’s streetscapes. The attractiveness of a successful design will also add to the value of a residential property or to the appeal of the businesses or institutions the facilities serve” (p. 38).
- “Within the Historic District, exterior lighting shall be directed or shielded so as to prevent light shining beyond the property lines of the property on which the light fixtures are located” (p. 43).



2.8 Local Ordinance Review

The Oak Ridge Development Ordinance has several existing sections related to supporting pedestrian transportation.

Chapter 30: Land Development
Article VII – Zoning
30-2 Purpose

(o) Nonresidential building size limitation purpose. The limitations on nonresidential building size, adopted and prescribed in this chapter, are found by the town council to be necessary and appropriate to:

- (1) Promote a safe and efficient pedestrian scale environment; and
(2) Foster a competitive and diverse mix of retail establishments.

Division 10 Overlay District Requirements
Includes Historic District Requirements
30-592 – Scenic Corridor Overlay district requirements
(a) General Requirements

Site design.

- a. Parking and loading areas for nonresidential uses shall be:
1. Designed as a single aisle of parallel or angled parking when located in front of the principal building or structure;
2. Located behind or to the side of the principal building or structure; or
3. For group or unified developments parking shall be designed in accordance with the principles illustrated in figure x-x.
b. Site design shall be pedestrian and bicycle friendly and shall include:
1. Sidewalks along street frontage on properties within the town core;
2. Clearly marked crosswalks to business entrance; and
3. Accessible bike racks at the rate of one space per 20 automobile parking spaces, installed per the adopted town bike rack standards.
c. All loading and dock areas shall be screened from view of the scenic corridor.

- d. Pump islands and drive-through facilities shall be located behind the principal building or structure.

Article VIII Subdivisions
Division 9 Subdivision Standards
30-860 Streets

This section has several sub-sections related to street widths, design, intersection treatments and other dimensional criteria for new streets.

30-862 Sidewalks

- (a) Except along controlled access facilities, sidewalks shall be required on all thoroughfares, collectors and local streets in the town core, as shown on the Oak Ridge Future Land Use Plan adopted May 2003. Where sidewalks are installed, they shall meet City of Greensboro standards and have a minimum width of five feet and be constructed just behind the street right-of-way line. Sidewalks may be constructed within the street right-of-way with approval of the town and NCDOT.
(b) Sidewalks shall be constructed at the time of development of any single lot being used for commercial or institutional purposes, and for any subdivision of land into building lots for residential, commercial or institutional purposes. The developer or sub-divider shall be responsible for sidewalk construction on all new streets or roads created as part of the development, and for existing streets or roads that abut the property being developed.

### 3. Streetscape Recommendations

#### 3.1 Streetscape Elements

A visual preference survey (Appendix A) was dispersed at town hall and online through social media. The results of this survey are important to shape the overall look of the town in the way the community hopes to see it portrayed. The “winners” of the survey have a related look of dark metal, slats, and classic appearance. No options that were abstract or modern received a high amount of votes. This classic village look is a strong nod to Oak Ridge’s many historic properties and culture. After survey results were compiled, the Streetscape Vision Stakeholders reviewed them and discussed comments, results, and worked to create a cohesive look that met the desires of the community. The highest ranked results of the survey are reviewed below, as well as feedback from the Streetscape Vision Stakeholders. The survey images should not be used as hard standing choices, but rather as guidelines for similar products and styles to be used in the Town.

#### Benches



The top-ranked bench is a decorative metal bench. Individual responses on the design were gathered, and participants most liked the classic design, shape, back support, color, and material. Benches should be placed in areas of high pedestrian activity as well as on stretches of more rural areas.

Benches are beneficial for physical health by providing resting places for those with limited mobility. Benches also act as a meeting space and waiting area.

#### Planters



A wooden box style planter ranked highest among survey participants. The most celebrated aspects of this design were the material, shape, and its simplicity. However, after discussion with the stakeholder committee, in order to better match the other selections and provide a comprehensive look and feel, the committee suggested a planter with a similar classic look of the other streetscape amenities. In addition to a

classic black look, a brick planter or brick border may be used to reflect the downtown’s historic look. This option allows for plantings in areas that may not be suitable for planter placement such as corners or medians.

#### Bike Racks

Black Metal S-shaped biked racks were ranked highest in the visual survey. Survey participants liked the shape, design, color, and recognizable style. Bicycle parking invites cyclists into the town core, making it a destination from neighboring areas to visit and safely park bicycles while shopping. Bicycle parking also shows that the town values sustainability.



**Trash Receptacles**



The black metal trashcan rated highest for its design, color, and shape. Survey participants repeatedly showed dislike for other colors, materials, and trashcan lids (for sanitary concerns). Participants also showed favor to street side recycling receptacles. These comments encourage the use of a simple design with two separate receptacles, one specifically marked and branded as recycling.

**Lighting**

The black metal shepherd hook lighting option was top rated by over half of survey participants. However, after discussion with the Streetscape Vision Stakeholders, a more classic design was decided on based on existing lighting and maintaining the village feel with the other amenities. Lighting in Oak Ridge must meet the Illuminating Engineering Society of North America (IESNA) full cut-off requirements. This lighting type prevents light pollution and adverse effects such as glare, light clutter, decreased visibility, and energy waste.



**Sidewalks**

Survey participants favored brick sidewalks and brick accented sidewalks to other options given. The top concerns given about this sidewalk type were concerns about buckling bricks creating an uneven surface. Brick accented sidewalks were also ranked highly and had less survey participants concerns about uneven surfaces. The stakeholder committee recommended this sidewalk type to be used in addition to primarily brick sidewalks. Historic districts should use primarily brick sidewalks to maintain and match the look and feel of the area. The commercial areas should use brick accents to tie back to the historic properties.



3.2 Corridor Recommendations

Commercial Zone

Location

Areas closest to the NC 68 and NC 150 intersection containing shopping and dining destinations.

Streetscape Elements

- Acorn style cutoff lights.
- Concrete and brick sidewalks.
- Benches.
- Planters.
- Trash receptacles.

Landscaping

- Small to medium shrubbery recommended no taller than three (3) feet.
- Small to medium trees recommended for areas closest to roadways.
- Larger trees permitted depending on location with no branches below six (6) feet from the ground.

Parking

- On-street parking should be encouraged in areas where it is allowed. It is recommended to have all other surface parking placed behind buildings.
- Special consideration should be given to providing parking spaces that also double as electric vehicle charging stations.
- Bicycle racks are recommended throughout commercial areas.

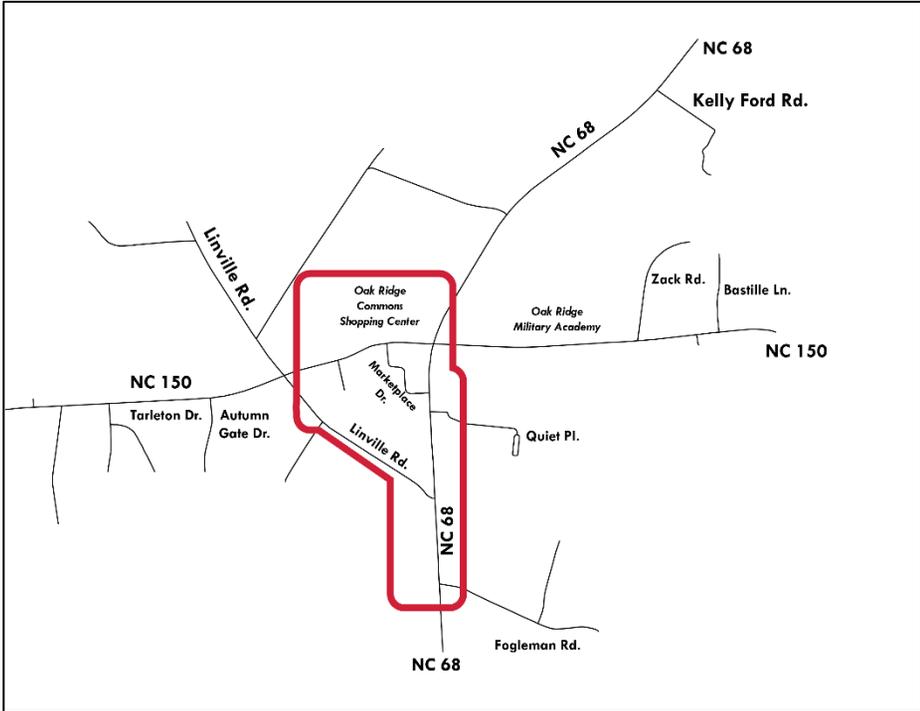


Figure 11: Sample Commercial Zone – Before and After



**Residential Zone**

**Location**

Neighborhood areas are connecting to larger corridors.

**Streetscape Elements**

- Overhanging street lights.
- Concrete and brick sidewalks.
- Benches (where requested).
- Planters.
- Trash receptacles.

**Landscaping**

- Small to medium shrubbery no taller than three (3) feet.
- Small to medium trees.
- Larger trees permitted but should have no branches lower than six (6) feet from the ground.

**Parking**

On-street parking should be encouraged in areas where it is allowed. Majority of parking will remain on private property.

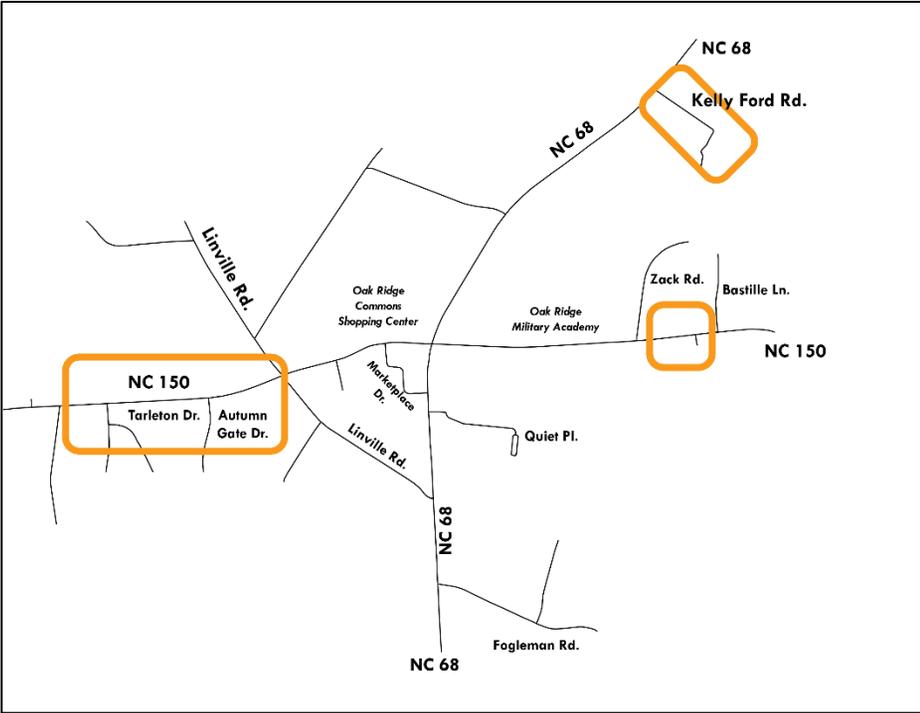


Figure 12: Sample Residential Zone – Before and After



Rural Zone

Location

- Less developed property on the fringe of Town Core.
- Areas that best exemplify Oak Ridge’s rural character.

Streetscape Elements

- Overhanging street lights.
- Wide sidewalks (recommendation to consider wide 6’ multi-use paths to accommodate bicycle and pedestrian traffic at the same time).
- Benches (where requested or appropriate).
- Trash receptacles located near benches.

Landscaping

- Small to medium shrubbery no taller than three (3) feet.
- Small to medium trees.
- Larger trees permitted but should have no branches lower than six (6) feet from the ground.

Parking

Due to higher traffic speeds and limited right-of-way along roadways, parking options should be limited to private property and standalone parking lots where appropriate.

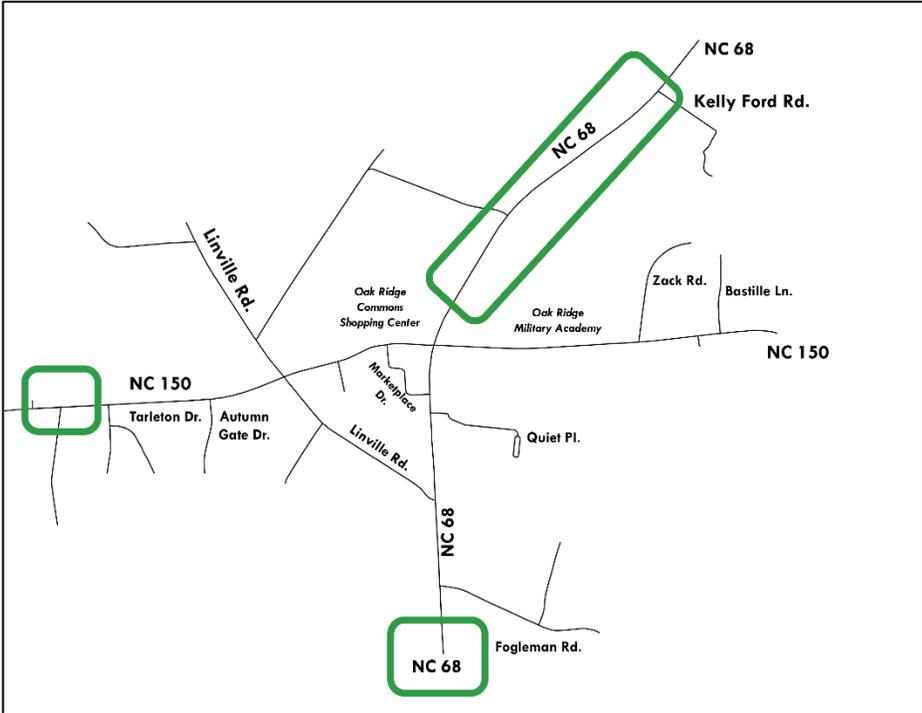


Figure 13: Sample Rural Zone – Before and After



Historical Zone

Location

Areas of historical significance or found within the Historic District.

Streetscape Elements\*

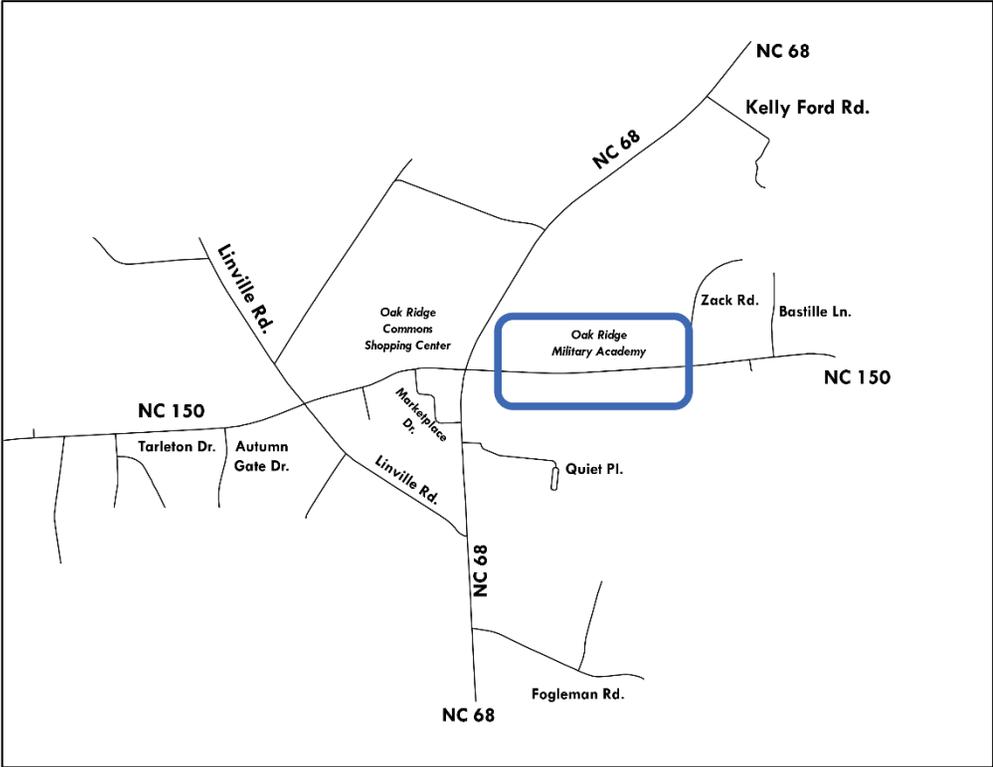
- Acorn style cutoff lights.
- Brick sidewalks.
- Benches (where requested or appropriate).
- Trash receptacles located near benches.
- Planters (where appropriate).

Landscaping\*

- Small to medium shrubbery no taller than three (3) feet.
- Small to medium trees.
- Larger trees permitted but should have no branches lower than six (6) feet from the ground.
- Replace lost mature trees and shrubs with similar plantings, and repair landscape features with authentic or similar materials.

Parking\*

- On-street parking should be encouraged in areas where it is allowed. Utilize mature plantings and trees to screen on-site parking areas.
- Bicycle racks are recommended where allowed.



\*All streetscape elements, final landscape designs, and parking improvements should conform to guidelines established in the "Oak Ridge Historic District Design Guidelines" or approved by the Historic Preservation Commission.

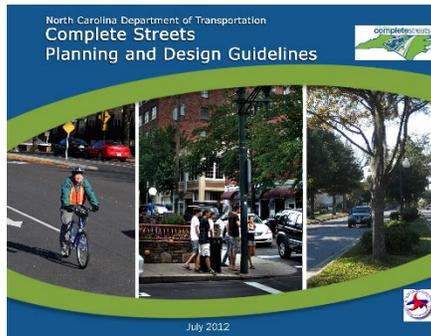
Figure 14: Sample Historical Zone – Before and After



### 3.3 Transportation Infrastructure

#### Bicycle & Pedestrian Accommodations

The North Carolina Department of Transportation defines complete streets as roadways that are safe and comfortable for all users, including pedestrians, bicyclists, transit riders, motorists, and individuals of all ages and capabilities. These streets generally include sidewalks, bicycle lanes, transit stops, appropriate street widths and speeds, and are well-integrated with surrounding land uses. Complete Streets design elements that emphasize safety, mobility, and accessibility for multiple modes may include crosswalks, bus lanes, landscaping, lighting, signaling systems, and adequate separation between sidewalks and streets. The benefits of this approach include:



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

For the previous fifty years, streets have generally been designed to serve one mode, motor vehicles, and often have been designed without sidewalks or bike facilities. In contrast, Complete Streets are intended to serve people using all modes. This plan encourages the use of Complete Streets when new transportation infrastructure is constructed in the Town Core.

Appendix B contains recommended signs and markings to accommodate bicycle and pedestrian traffic and Appendix C contains a list of additional sources for roadway guidelines.

#### Intersection Improvements

The installation of a roundabout (or traffic circle) at the intersection of NC 68 and NC 150 would help establish a village feel for the Oak Ridge Town Core.

Modern roundabouts are circular intersections that use a rotating flow of traffic to allow safer and slower movements of traffic through intersections. All vehicles entering a roundabout must yield to vehicles already in the circulating roadway, resulting in a constant flow of traffic into and out of the circle (Source: Town of Cary).

#### Advantages

- Improved overall safety: Up to a 90% reduction in fatalities, 76% - 85% reduction in injury crashes and 35% - 62% reduction in all crashes.
- The design of a roundabout includes median islands and a center island that is designed to control and reduce speeds so that drivers can enter and exit the roundabout safely, with enough visual distance to react to vehicles, cyclists, and pedestrians.
- Roundabouts use crosswalks that are set back from the circulating roadway by a distance equal to about one car length. This allows queued vehicles to leave a gap for pedestrians to use the crosswalk, and drivers don't have to negotiate both pedestrians and circulating traffic at the same time. The median island allows pedestrians to base their crossing on one lane of traffic at a time (Source: Town of Cary).

Figure 13 on the following page contains images of roundabout designs from around North Carolina.

Figure 15: Roundabout Design Examples



Image Sources: NCDOT & SEPI Engineering

## Parking

Location and size requirements for motorized vehicle parking should be revisited every few years as streetscape projects are implemented and the Town Core becomes more developed. Parking along the major corridors of NC 68 and NC 150 may not be allowed by NCDOT, but requirements for adjacent parking lots on private land is encouraged. This plan makes the following recommendations regarding parking within the Town Core boundary:

- Revise the Town Ordinances to remove parking minimums aside requirements related to handicapped parking. The purpose of this is to:
  - Encourage visitors to the Town Core to park once and walk to multiple destinations.
  - Allow for closer development between buildings.
  - Preserve adjacent rural green space that would otherwise be converted into impermeable asphalt.
- Encourage minimal or zero setbacks for new commercial buildings and require parking (if needed) in the rear of buildings away from view. These changes will promote the look and feel of a small town central business district (Figure 9).
- Implement bicycle parking minimums. Bicycle parking recommendations are shown in the table located in Appendix F.
- Ensure space is available for future public transportation stops, electric car charging stations, and autonomous vehicle drop-off sites.

Figure 16: Building Setback Example



Building with zero setback and a physically separated sidewalk in Denmark, SC. Images Source: Alta Planning + Design

## 3.4 Safety & Security

Crime Prevention Through Environmental Design (CPTED) is an approach to deterring criminal behavior through the effective design and use of the built environment. CPTED is proven to reduce crime, reduce the fear of crime, and improve the overall quality of life in a community. CPTED utilizes the following principles:

1. **Natural Surveillance:** Natural surveillance occurs by designing the alignment and features of the greenway in such a way as to maximize visibility and foster positive social interaction among legitimate users of the Greenway.
2. **Natural Access Control:** Natural access control limits the opportunity for crime by taking steps to clearly differentiate between public space and private space. By determining the location of entrances and exits, fencing, lighting and landscape to limit access or control flow, natural access control occurs.

3. **Natural Territorial Reinforcement:** Territorial reinforcement promotes control through increased definition of space. By using fences, pavement, signs, lighting, and the entire landscape to define ownership and public, semi-public and private space.
4. **Maintenance:** Maintenance is an expression of “ownership” of property. Deterioration indicates less control by the intended users of a site and indicate a greater tolerance of disorder.

This plan encourages the use of use of CPTED principles when new transportation infrastructure, parks, and public facilities are constructed in the Town Core.

### 3.5 Landscaping Recommendations

The purpose of landscaping, screening, and buffer requirements are to provide standards that will protect the health, safety and general welfare of the public, enhance property values, improve the appearance of the community, and preserve natural resources, trees, and native plants. Requirements such as these should be applied to all new development, redevelopment or building expansion projects including streetscaping of rights-of-ways within the Town Core especially the NC 68 and NC 150 corridors. Minimum streetscape landscaping requirements should:

1. Reduce soil erosion and increase infiltration in permeable land areas essential to stormwater management and ecosystem health;
2. Establish a landscape theme including street trees and streetscape designs to be used throughout the Town Core to promote the overall character and identity of the community;
3. Preserve existing native vegetation as an integral part of wildlife habitats, and incorporate native plants and ecosystems into landscape design;
4. Promote innovative and cost-conscious approaches to the design, installation, and maintenance of landscaping while encouraging water and energy conservation;
5. Promote planting techniques that ensure long term health of plant materials;

6. Screen unsightly equipment or materials from the view of persons on public streets or adjoining properties and buffering from uncomplimentary land uses;
7. Maintain and increase property values by requiring site appropriate landscaping to be incorporated into development that is designed and installed by a qualified landscape professional;
8. Promote walkable pedestrian-scale streetscapes, traditional neighborhoods, and compact centers by exempting uses which relate to each other functionally and visually from certain requirements of this Section.

#### CPTED Specific Landscaping Recommendations

- Planting and selection of landscape materials should be such that sight lines remain open and clear and places of concealment are not fostered.
- Keep shrubs trimmed to 3 feet, or at least below windowsills, when safety is an issue. Prune the lower branches of trees to at least 6 - 8 feet off the ground.
- If graffiti is a known problem in the area, specify thorny landscape plants as a natural barrier to deter unwanted entry.
- Specify vines or planted wall coverings to deter graffiti. Avoid blank spaces, which may be an invitation to graffiti vandals.
- Provide landscape and fencing that do not create hiding places. Consider creative solutions to fencing schemes that work aesthetically, as well as functionally.
- Use lighting in the landscaping, both for security and aesthetics.

The following tables are recommended street trees for Oak Ridge.

Table 5: Recommended Street Trees

LARGE TREES: Mature height greater than 50 feet tall								
TREE SPECIES		SHAPE	GROWTH RATE			VISUAL INTEREST	ENVIRONMENTAL TOLERANCE	PROBLEMS
Scientific Name	Common Name		Slow	Medium	Fast			
<i>Eucommia ulmoides</i>	Hardy rubber tree	Rounded	•				Drought	
<i>Fraxinus pennsylvanica</i>	Green ash	Rounded		•		✖	High pH/Salt/Drought/Compaction	Numerous seeds can be problematic on females
<i>Gleditsia triacanthos</i> var. <i>inermis</i>	Thornless honeylocust	Rounded		•		✖	Wet soils/Drought/Salt/High pH/Compaction	Plant bugs, mites, webworm
<i>Gymnocladus dioica</i>	Kentucky coffeetree	Rounded		•			Drought/Salt/High pH	Pods may be problematic; Needs adequate growing space
<i>Liquidambar styraciflua</i>	Sweetgum	Pyramidal		•		✖	Wet soils	Needs adequate growing space; Fruit litter may be problem, 'Rotundiloba' may be alternative
<i>Metasequoia glyptostroboides</i>	Dawn redwood	Pyramidal		•			Wet soils/High pH	
<i>Nyssa sylvatica</i>	Black gum	Pyramidal		•		✖	Acid soils	
<i>Platanus x acerifolia</i>	London planetree	Rounded			•		Compaction/Drought/ Salt	Adequate space; Anthracnose can be problem.
<i>Quercus bicolor</i>	Swamp white oak	Rounded	•				Wet soils/Drought/Salt/Compaction	Acorn litter. Requires ample space and acid soil
<i>Quercus imbricaria</i>	Shingle oak	Rounded		•			Dry soils	
<i>Quercus lyrata</i>	Overcup oak	Rounded		•			Wet soils	
<i>Quercus palustris</i>	Pin oak	Pyramidal		•		✖	Wide range of soils	Adequate space
<i>Quercus phellos</i>	Willow oak	Pyramidal			•		Wet or Dry sites/Compaction	
<i>Quercus rubra</i>	Northern red oak	Rounded			•	✖	Drought/Compaction/ Salt	Acorn litter

Key: ✖ Fall Leaf Color  
✖ Flower Color

Source: NC State University College of Natural Resources

<i>Quercus shumardii</i>	Shumard oak	Rounded		•			Drought/Compaction/ Salt	Acorn litter
<i>Quercus virginiana</i>	Live oak	Rounded	•				Wet soils/Compaction/ Salt	
<i>Sophora japonica</i>	Japanese pagodatree	Rounded		•			Drought/Compaction/ Salt	Litter problems; Canker can be a problem
<i>Taxodium distichum</i>	Baldcypress	Pyramidal		•			Wet soils/Compaction	
<i>Tilia tomentosa</i>	Silver linden	Rounded		•			Drought/Salt/pH adaptable/Compaction	Aphids
<i>Ulmus parvifolia</i>	Lacebark elm	Rounded		•			Drought/Salt/pH adaptable/Compaction	
<i>Zelkova serrata</i>	Japanese zelkova	Rounded		•			Drought/pH adaptable/Compaction	Narrow crotch angle susceptible to splitting

MEDIUM TREES: Mature height between 35 feet and 50 feet tall								
TREE SPECIES		SHAPE	GROWTH RATE			VISUAL INTEREST	ENVIRONMENTAL TOLERANCE	PROBLEMS
Scientific Name	Common Name		Slow	Medium	Fast			
<i>Acer rubrum</i>	Red maple	Rounded		•			Wet soils/compaction	Tends to have cankers under heavy stress; Over planted.
<i>Aesculus hippocastanum</i>	Horsechestnut	Rounded	•			 	PH adaptable/salt tolerant/compaction	Susceptible to leaf blotch and scorch
<i>Aesculus x carnea</i>	Red horsechestnut	Rounded	•				Compaction/acidic soil	
<i>Carpinus betulus</i>	European hornbeam	Narrow		•			Dry soils/pH adaptable	
<i>Carpinus caroliniana</i>	American hornbeam	Pyramidal	•			 	Acidic soils	Sensitive to drought and compacted soils
<i>Celtis laevigata</i>	Sugar hackberry	Rounded		•			Wet soils/compaction /salt	Intolerant of high pH
<i>Corylus colurna</i>	Turkish filbert	Narrow		•			Drought/pH adaptable	
<i>Juniperus virginiana</i>	Easter redcedar	Pyramidal		•			Drought/High pH/ Compaction/Salt	
<i>Koelreuteria paniculata</i>	Goldenraintree	Rounded		•			Drought/Salt/High pH	
<i>Phellodendron amurense</i>	Amur corktree	Rounded		•			Drought/Wet soils/pH adaptable	Fruit may be a problem on females
<i>Prunus sargentii</i>	Sargent cherry	Narrow			•	 	Drought/Salt/Acid soils	Avoid poorly drained sites. Japanese beetles

Key: Fall Leaf Color  
 Flower Color

SMALL TREES: Mature height less than 35 feet tall (suitable for planting under utility wires)								
TREE SPECIES		SHAPE	GROWTH RATE			VISUAL INTEREST	ENVIRONMENTAL TOLERANCE	PROBLEMS
Scientific Name	Common Name		Slow	Medium	Fast			
<i>Acer campestre</i>	Hedge maple	Rounded	•				High pH/Drought/compaction	
<i>Amelanchier arborea</i>	Serviceberry	Rounded		•		  		Specify tree form. Good alternative to crapemyrtle.
<i>Cercis canadensis</i>	Eastern redbud	Rounded			•	 	pH adaptable	
<i>Chionanthus retusus</i>	Chinese fringetree	Rounded	•					
<i>Cornus kousa</i>	Kousa dogwood	Rounded	•			 	Acidic soils	
<i>Crataegus viridis</i>	Green hawthorn	Rounded		•		  	PH adaptable/Drought/Wet soils	
<i>Halesia tetraptera</i>	Carolina silverbell	Rounded		•		 	Acid soils	Specify tree form. Good alternative to crapemyrtle.
<i>Lagerstromia spp.</i>	Crapemyrtle	Rounded			•	   	Wet soils	Over planted and often unnecessarily topped.
<i>Maackia amurensis</i>	Amur maackia	Rounded	•				Drought/pH adaptable	
<i>Malus spp.</i>	Flowering crabapple	Rounded		•		   	Wide range of soils/Salt/Compaction	Specify tree form; fruit litter problem; scab is a problem for many species
<i>Pistacia chinensis</i>	Chinese pistache	Rounded		•			High pH	
<i>Prunus caroliniana</i>	Carolina Cherrylaruel	Pyramidal			•		Drought/pH adaptable	Avoid poorly drained sites
<i>Prunus virginiana</i>	Chokecherry	Narrow			•	 	Drought/Salt	Avoid poorly drained sites
<i>Syringa reticulata</i>	Japanese tree lilac	Pyramidal		•			Drought/pH adaptable	

Key:  Fall Leaf Color  
 Flower Color

3.6 Recommended Future Planning Efforts

Town Branding & Marketing

This plan recommends that the Town of Oak Ridge develop a comprehensive town branding and marketing plan. Once decided, the unique town brand and color palate can be applied to several streetscape elements to extend the town’s visual identity into the built environment. Comprehensive branding can be applied to banners on light poles, directional signage, trash and recycling receptacles, sidewalks or brickwork (through stamping or stencils), decorative foundations, to name a few.

Figure 17: Town Branding & Light Pole Banner Example



Source: Town of Troy & PTRC

Circulation & Wayfinding

As the Town of Oak Ridge begins to improve the streetscape along the NC 68 and NC 150 corridors, it is recommended that the town consider undertaking a separate circulation and wayfinding study. Circulation is how people move into and around a specific area and wayfinding is the signage or similar design elements that successfully guide visitors to where they need to go. A circulation and wayfinding study will assist the town as it installs new signage to handle the increasing traffic that will be entering the Town Core in future years. A sample signage plan illustration could look like the image below that was used for the City of Hickory. Color, logos,

and architectural elements can be incorporated into future signage and fixtures which can highlight the town’s rich history and culture.

Figure 18: Branding & Wayfinding Signage Examples



Source: Deep Fried Creative

Public Art & Gateways

Public art in recent years has become an important part of towns for both aesthetic and security reasons. Public art such as murals, sculptures, and decorative facades enhance the physical appearance of the environment and celebrate the unique characteristics and identity of the Oak Ridge community. This plan recommends the Streetscape Vision Committee consider the use of public art as streetscape element and develop a strategy to bring more into the community.

Figure 19: Streetscape Art Example



Source: City of Fayetteville, NC

A separate but related type of public art are town gateways. Gateways should be considered at the boundary of NC 68 and NC 150 to visually and verbally announce to visitors they are entering the Town Core. Gateways should be given the same consideration as wayfinding as far as communicating the town’s rich history.

Figure 20: Gateway Examples



Source: Sternberg Lighting & City of Fayetteville, NC

## 4. Implementation Strategy

This chapter defines a structure for managing the implementation of the Oak Ridge Streetscape Vision Plan. Both leadership and dedication will be critical to the implementation process as will coordination with numerous agencies and stakeholder groups. Equally critical is the identification of and use of reoccurring funding sources of revenue. Even small amounts can be useful to the implementation process when matched with outside sources. The climate of uncertainty faced by local governments and other agencies make it difficult to determine the level of resources that may be available in the future to implement the ideas outlined in this plan. However, several important actions can still take place to prepare for major investments including organizational steps and pursuing low-cost solutions. It is also recommended to plan over time to take advantage of strategic opportunities as they might arise and to adjust this plan as needed to achieve the greatest impact.

### 4.1 Advocacy Strategy

The following implementation advocacy strategy is proposed in order to maximize the likelihood that the Streetscape Vision Plan's recommendations can become a reality the coming years:

#### 1. Create a Streetscape Vision Committee

A group with ownership/vested interest in the success of this Plan needs to become the principal ongoing champion, supporter, promoter, and advocate for implementing the Plan's recommendations. This group could be the existing stakeholder group, or could be a new association augmented by representatives from different groups within the Town Core. To be effective, the implementation advocacy group needs to develop a lobbying, marketing and promotions strategy to encourage the Town of Oak Ridge elected officials, town staff, and impacted Oak Ridge property owners to remain committed over time to the concepts, vision, and implementation recommendations contained in this Plan. It would also be advantageous to develop ongoing, positive relationships with the media related to the implementation of the Plan.

#### 2. Prepare an Annual Implementation Progress/Status Report

The preparation of an annual implementation progress/status report would be a formalized means by which the implementation advocacy group could

communicate the progress of Plan implementation to various groups, stakeholders, media and the community at large. It would also serve as a formal, annual reminder of the importance of the Plan to Town elected officials and senior city staff members. To better guide and focus its efforts, the implementation advocacy group should also prepare an annual strategic action item/to do list.

### 4.2 Critical Path for Implementation

The following is a suggested implementation steps. The action items are grouped by a five-year block and in most cases are not in sequential order. The suggested party or parties who need to complete each action step is also included. Opportunities to implement certain action items may arise before others and these opportunities should be pursued. The action items below are a menu of options for the Town to pursue as time, resources and political will allow. If there are budgetary implications for action items, the budget amount is indicated. Each new project or program and policy change should be evaluated for effectiveness as needed. In 2025, a broader assessment and evaluation of efforts should be performed to both look at proposed changes and their progress, but also to look at new ideas and new challenges.

#### Short Term: 1-5 Years

- Organize Streetscape Vision Committee.
- Approve new policy and ordinance recommendations as needed.
- Develop strategy with GUAMPO to submit new bicycle and pedestrian projects to NCDOT's Prioritization process.
- Work with NCDOT to reduce posted speed limit on NC 68 and NC 150 from 35 mph to 30 mph within the Town Core.
- Install street landscaping (including street trees, raised planter boxes, and planter pots) in priority locations along NC 68 and NC 150.
- Install upgraded pedestrian crosswalk improvements including wheelchair ramps with detectable warnings along the NC 68 and NC 150 corridors.

- 
- Work with developers and business owners to install bicycle racks within commercial areas.
  - Work with Duke Energy to install new lighting fixtures to replace older lighting.

**Medium Term: 6-10 Years**

- Finalize the installation of upgraded pedestrian crosswalk improvements including wheelchair ramps with detectable warnings along the NC 68 and NC 150 corridors.
- Extend streetscaping standards to other corridors within the Town Core.
- Continue seeking grant funding and working with GUAMPO to submit new bicycle and pedestrian projects to NCDOT's Prioritization process.

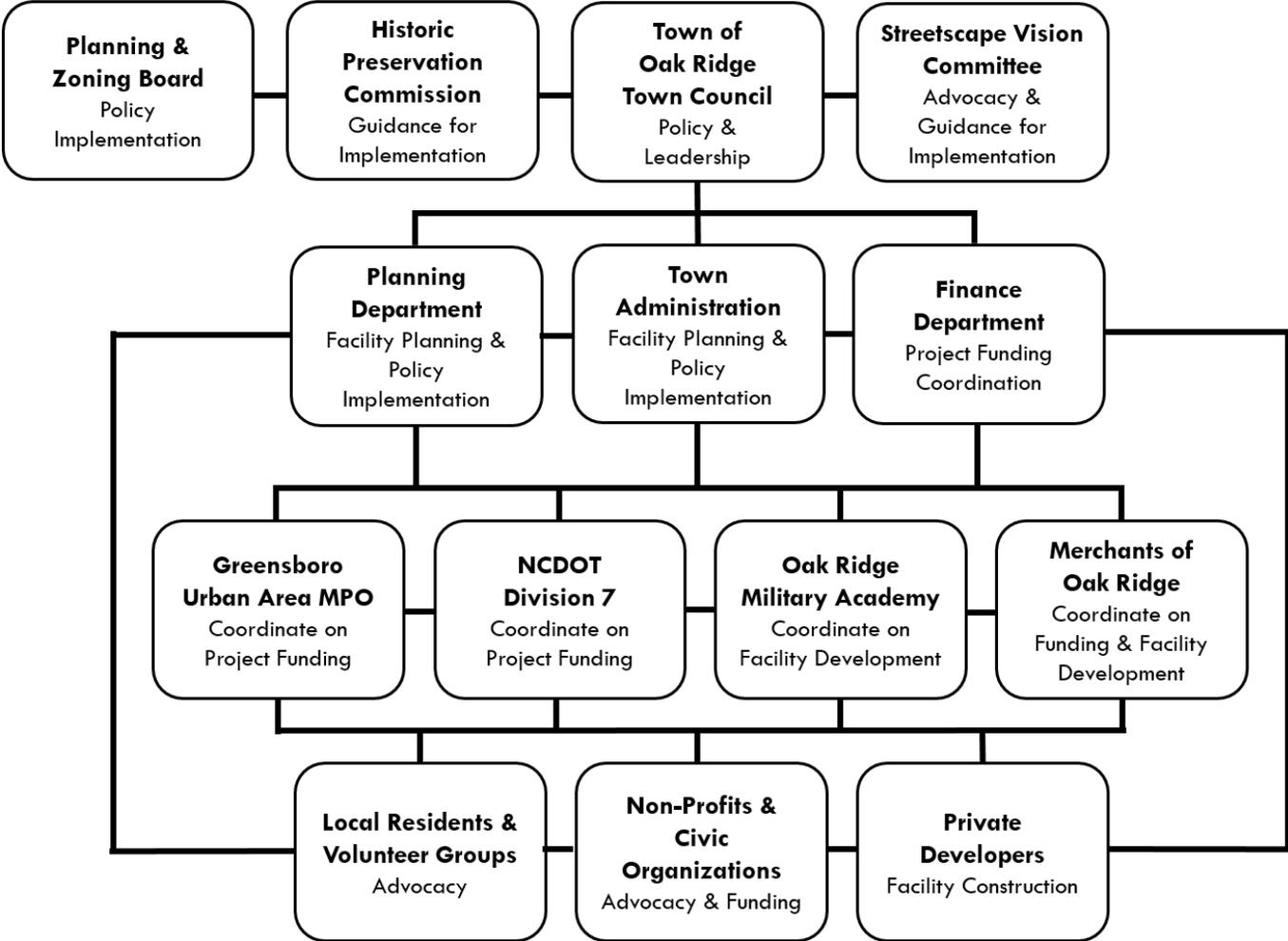
**Long Term: 10+ Years**

- Bury overhead utilities lines.

- Continue seeking grant funding and working with GUAMPO to submit new bicycle and pedestrian projects to NCDOT's Prioritization process.

4.3 Organization Framework & Stakeholder Roles

The following chart illustrates the suggested organizational framework and stakeholder roles in implementing streetscape improvements in Oak Ridge.



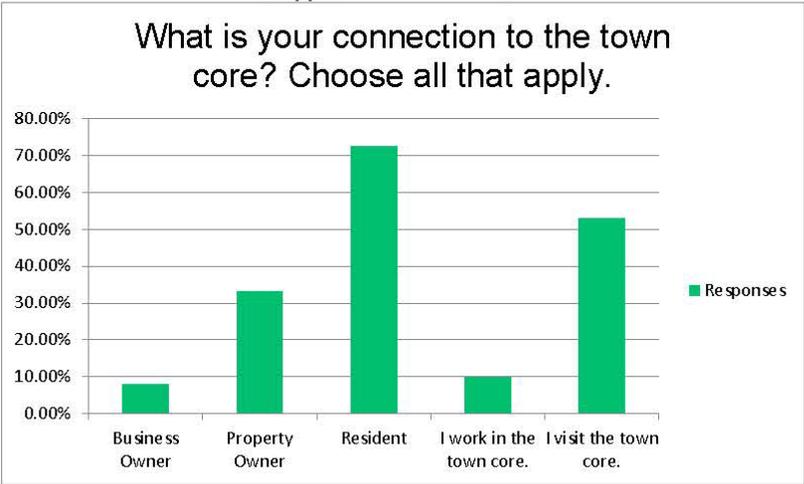
# Appendix A: Survey Results

## Initial Streetscape Survey Results

Town of Oak Ridge - Streetscape Survey

1. What is your connection to the town core? Choose all that apply.

Answer Choices	Responses	
Business Owner	7.91%	20
Property Owner	33.20%	84
Resident	72.33%	183
I work in the town core.	9.88%	25
I visit the town core.	52.96%	134
<b>Answered</b>		<b>253</b>
<b>Skipped</b>		<b>0</b>

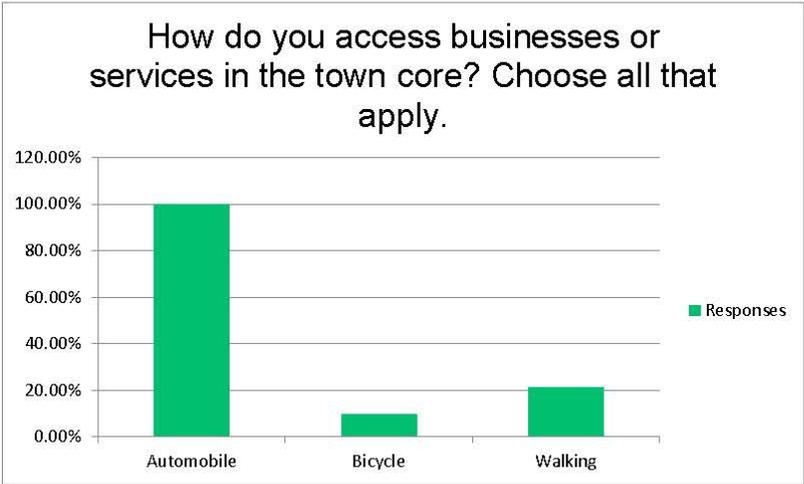


2. How do you access businesses or services in the town core? Choose all that apply.

Answer Choices	Responses	
Automobile	99.60%	252
Bicycle	9.49%	24
Walking	21.34%	54
Other (please specify)		7
<b>Answered</b>		<b>253</b>
<b>Skipped</b>		<b>0</b>

**Other Summary:**

Would Walk if could	5
Would Bike if could	1
Golf Cart	1



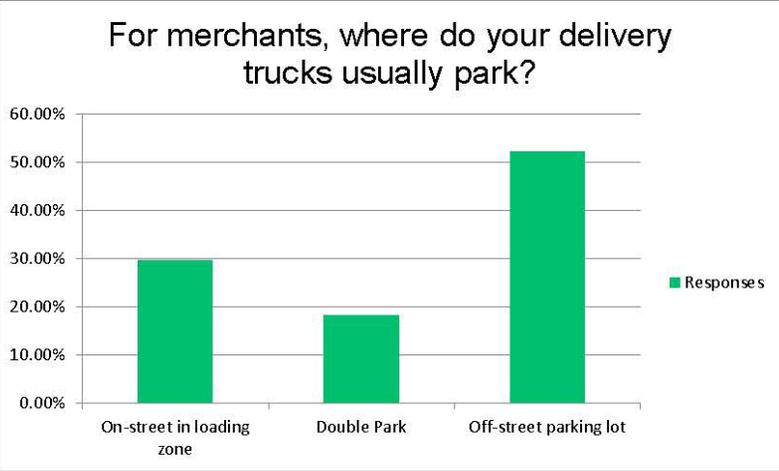
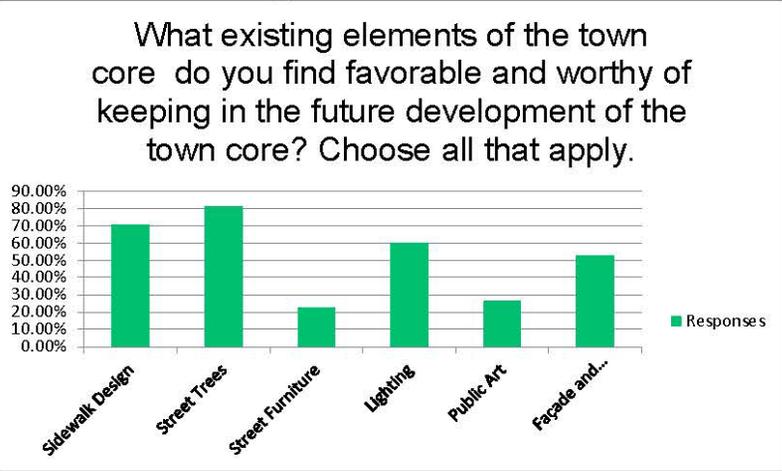
Town of Oak Ridge - Streetscape Survey

3. What existing elements of the town core do you find favorable and worthy of keeping in the future development of the town core? Choose all that apply.

Answer Choices	Responses	Other Summary:
Sidewalk Design	70.08% 171	Park 2
Street Trees	81.15% 198	Minimal Light Pollution 3
Street Furniture	22.54% 55	Farm Land 1
Lighting	59.84% 146	Historic District 3
Public Art	26.23% 64	
Façade and Architecture	52.46% 128	
Other (please specify)	23	
<b>Answered</b>	<b>244</b>	
<b>Skipped</b>	<b>9</b>	

4. For merchants, where do your delivery trucks usually park?

Answer Choices	Responses	Other Summary:
On-street in loading zone	3.07% 13	NA 60
Double Park	1.89% 8	Didn't Notice 1
Off-street parking lot	5.42% 23	Rear 1
Other (please specify) x	60	
<b>Answered</b>	<b>104</b>	
<b>Skipped</b>	<b>149</b>	



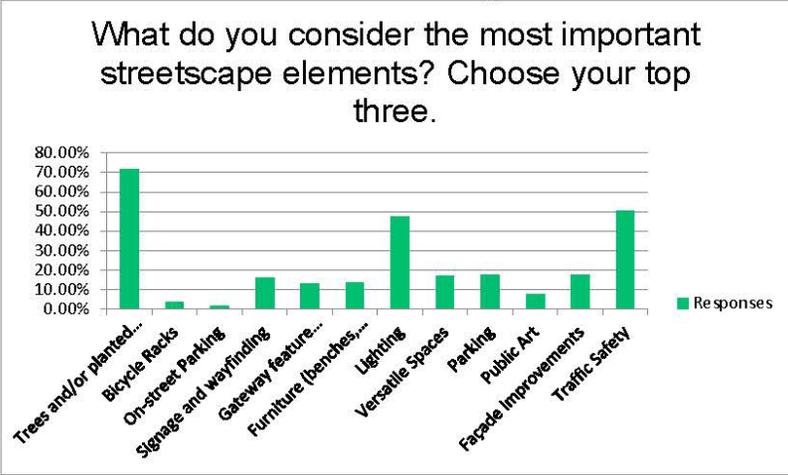
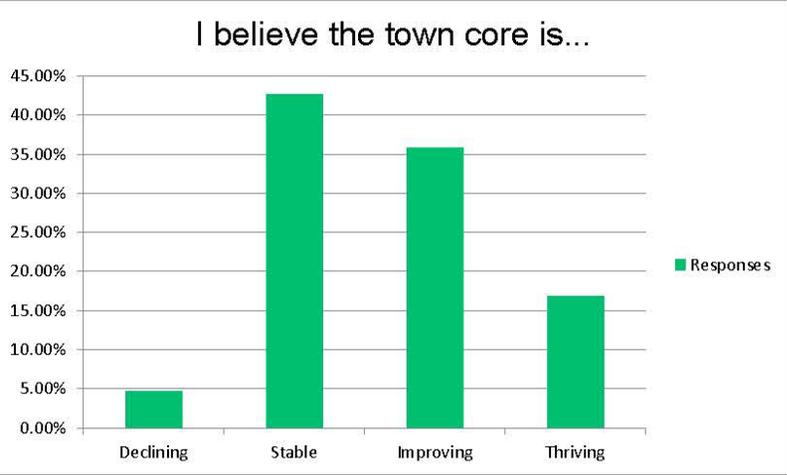
Town of Oak Ridge - Streetscape Survey

5. I believe the town core is...

Answer Choices	Responses	Other Summary:
Declining	4.64% 11	Declining
Stable	42.62% 101	Don't Know
Improving	35.86% 85	Improving
Thriving	16.88% 40	Improving and Declining
Other (please specify)	22	Limping
<b>Answered</b>	<b>237</b>	Losing Small Town Feel
<b>Skipped</b>	<b>16</b>	Stagnant
		Too much Growth
		x

6. What do you consider the most important streetscape elements? Choose your top three.

Answer Choices	Responses	Other Summary:
1 Trees and/or planted medians	71.54% 181	Less is more 1
2 Bicycle Racks	3.16% 8	Lighting 3
1 On-street Parking	1.58% 4	Sidewalks 14
1 Signage and wayfinding	15.81% 40	Traffic Safety 1
1 Gateway feature (formal entrance to town)	13.04% 33	Walkability 1
3 Furniture (benches, garbage/recycling bins, etc)	13.44% 34	x 2
1 Lighting	47.43% 120	
3 Versatile Spaces	17.00% 43	
9 Parking	17.39% 44	
Public Art	7.51% 19	
Façade Improvements	17.39% 44	
Traffic Safety	50.20% 127	
Other (please specify)	22	
<b>Answered</b>	<b>253</b>	
<b>Skipped</b>	<b>0</b>	



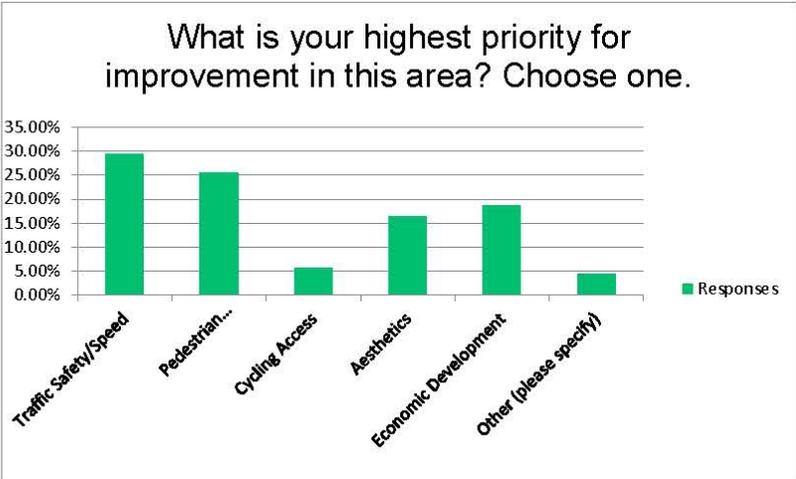
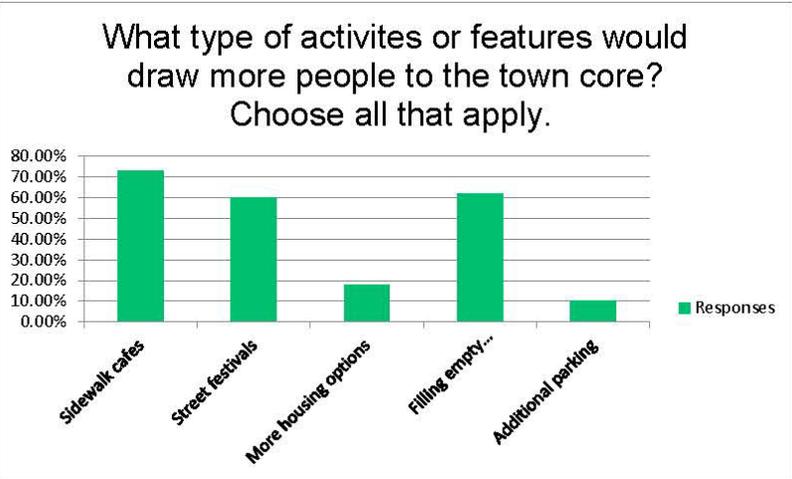
Town of Oak Ridge - Streetscape Survey

7. What type of activities or features would draw more people to the town core? Choose all that apply.

Answer Choices	Responses	Other Summary:
Sidewalk cafes	73.22%	175
Street festivals	60.25%	144
More housing options	17.99%	43
Filling empty storefronts/more retail	61.92%	148
Additional parking	10.04%	24
Other (please specify)		44
<b>Answered</b>		<b>239</b>
<b>Skipped</b>		<b>14</b>
		Limit Growth 5
		More festivals/events 5
		More Restaurants 5
		Placemaking 5
		Improve Traffic Patterns 3
		More businesses 3
		MST 3
		Sidewalks 3
		Affordable Housing 2
		More Sidewalks 2
		Curbs 1
		Define Town Core 1
		Library 1
		More small businesses 1
		Nothing More 1
		Reduce Vacant Buildings 1
		Tennis Courts 1

8. What is your highest priority for improvement in this area? Choose one.

Answer Choices	Responses	Other Summary:
Traffic Safety/Speed	29.48%	74
Pedestrian Access/Sidewalk	25.50%	64
Cycling Access	5.58%	14
Aesthetics	16.33%	41
Economic Development	18.73%	47
Other (please specify)	4.38%	11
<b>Answered</b>	<b>251</b>	
<b>Skipped</b>	<b>2</b>	
		Tennis Courts 1
		YMCA 1
		Local Restaurants 1
		Green Space 1
		Diverse Retail 1
		Increase Restaurant Options 1
		Fence in Park 1
		Limit Growth 1
		Sidewalks 1
		Village Feel 1
		Road Improvements 1



Town of Oak Ridge - Streetscape Survey

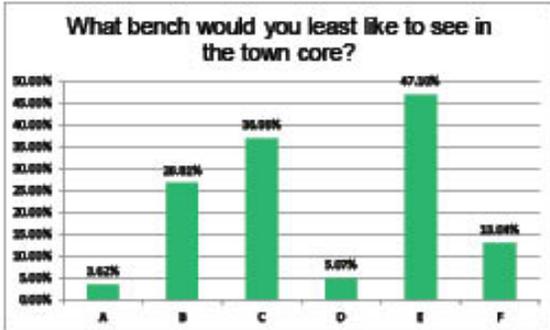
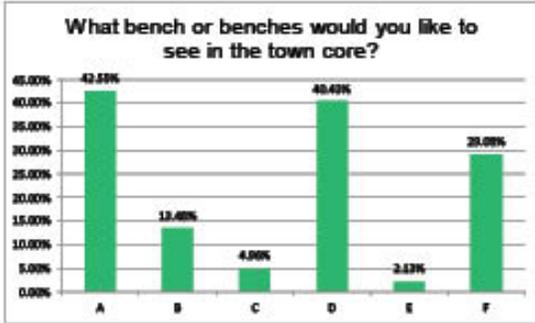
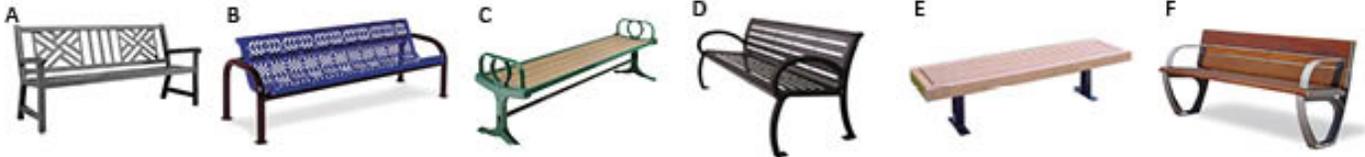
Describe Oak Ridge's Town Core in one word.

Answered 210
Skipped 43

- 11 Quaint 2 Attractive 2 welcoming 1 Enough 1 Opportunistic 1 southern
9 Growing 2 Awesome 1 Adequate 1 Family 1 ordinary 1 Sprawling
8 Beautiful 2 Car-oriented 1 Antiquated 1 Fine 1 Organic 1 Stagnant
7 Boring 2 Charming 1 Average 1 Flourishing 1 ORMA 1 Successfu
7 busy 2 Congested 1 Biased to specia 1 friendly 1 Overcrowded 1 Sweet
6 Improving 2 Developing 1 Bipolar 1 good 1 Over-govermed 1 Traditiona
6 Potential 2 Disjointed 1 blahh 1 Happening 1 Overgrown 1 Traffic
5 small 2 expanding 1 Brown 1 Huge 1 Plain 1 Transition
4 Nice 2 Functional 1 business 1 Jumbled 1 Planned 1 Under-de
3 Clean 2 Home 1 central 1 liveable 1 Pleasant 1 Uninviting
3 Convenient 2 Inviting 1 Cheap 1 Location 1 Potential 1 unkempt
3 Evolving 2 Limited 1 classic 1 Lovely 1 precious 1 Unremark
3 Historic 2 Mediocre 1 Comfortable 1 Making progress 1 pretty 1 Unsustain
3 Lacking 2 Progressing 1 Community 1 Maturing 1 Promising 1 Urban
3 Non descript 2 Quiet 1 Compact 1 Mismatched 1 quality 1 Valuable
3 Ok 2 Strip Mall 1 Cozy 1 Monochromatic 1 Ready! 1 limited
3 Peaceful 2 suburban 1 Dated 1 Mystery 1 Retail 1 retail
3 Progressive 2 undefined 1 Emerging 1 Needs help 1 Settled 1 Village
2 Accessible 2 Vibrant 1 Enormous 1 New 1 Simple 1 Well done
1 Well-plan
1 Wonderfu

Visual Preference Survey Results

*Benches*



Bench A Pros		Bench B Pros		Bench C Pros		Bench D Pros		Bench E Pros		Bench F Pros	
15	Design	11	Shape	2	No Back	11	color	1	durable	21	material - wood
15	shape	5	Color	2	Shape	11	shape	1	low cost	8	back support
10	back support	3	Back support	2	Simple	9	classic	1	shape	8	color
10	color	3	material	1	Color	8	back	1	simple	7	design
5	Classic Design	1	appearance	1	Material	6	material	1	size	7	shape
5	Material	1	comfort			5	design	1	useful	3	modern
2	Low maintenance	1	design			4	comfortable			2	comfortable
3	traditional look	1	low maintenance			4	low maintenance			1	clean lines
1	current	1	Most attractive			4	traditional			1	forward thinking
1	detail					3	durable			1	historic
1	homey					3	simple			1	inviting
1	inviting					2	attractive			1	low maintenance
1	style					2	clean lines			1	style
						1	basic			1	timeless
						1	easy to maintain			1	upscale
						1	looks historic				
						1	modern				
						1	old town feel				
						1	southern charm				
						1	style				
Bench A Cons		Bench B Cons		Bench C Cons		Bench D Cons		Bench E Cons		Bench F Cons	
3	design	9	design	10	no back	3	color	17	no back	3	design
1	boring	6	too modern	12	design	1	looks cheap	5	shape	4	color
1	color	4	color	6	shape	2	uncomfortable	7	material - wood	3	shape
1	cheap	4	uncomfortable	5	basic	1	Plain	7	design	2	material
		2	cheap	4	cheap	1	too modern	3	cheap	1	looks cheap
		2	shape	3	lifespan	3	shape	2	basic	1	style
		1	busy	3	color			2	boring	1	too modern
		1	material	3	material			1	availability	1	Ugly
				3	uncomfortable			1	Cold	1	uncomfortable
				2	Cold						
				1	tacky					1	don't blend in
				1	ugly					1	low lifespan

# PLANTERS

A



B



C



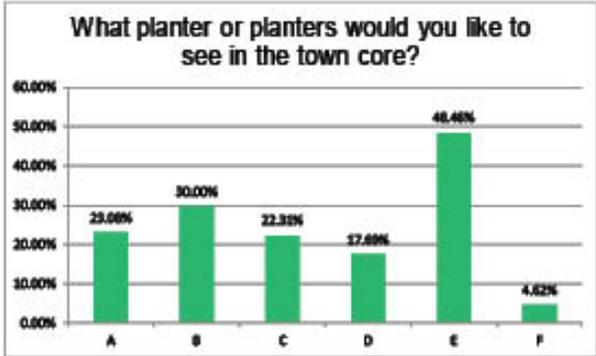
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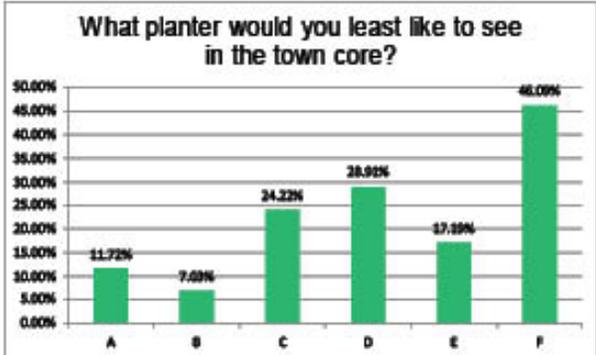
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F

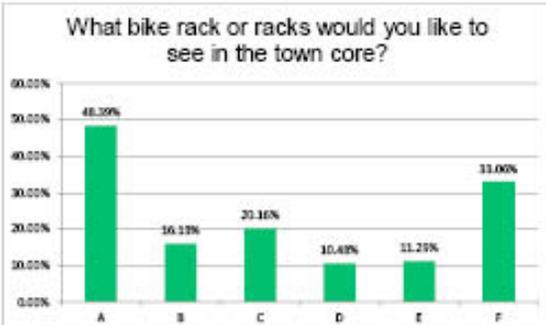
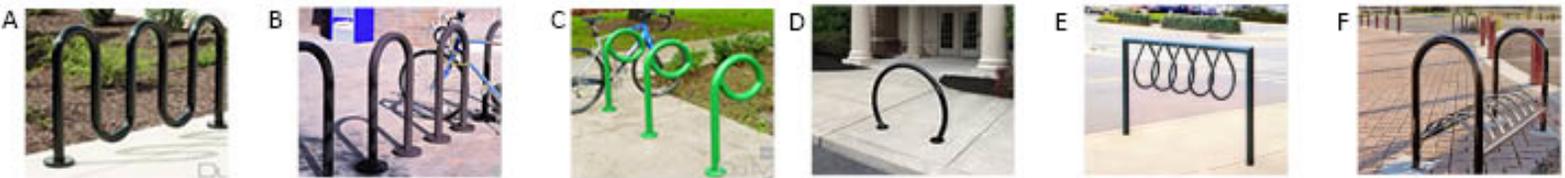


Planter A Pros	Planter B Pros	Planter C Pros	Planter D Pros	Planter E Pros	Planter F Pros
8 material	8 durable	3 color	4 design	11 wood	2 design
7 design	4 color	3 design	4 durable	8 shape	1 color
7 shape	4 Design	3 shape	2 shape	7 simple	1 material
4 durability	4 material	3 size	2 size	5 size	1 shape
3 size	5 shape	3 durable	2 color	2 design	
2 color	2 classic	2 material	1 heavy	1 different	
2 sustainable	1 flexible	1 appearance	1 modern	1 inexpensive	
	1 variety	1 classic		1 sturdy	
		1 simple			
		1 sustainable			

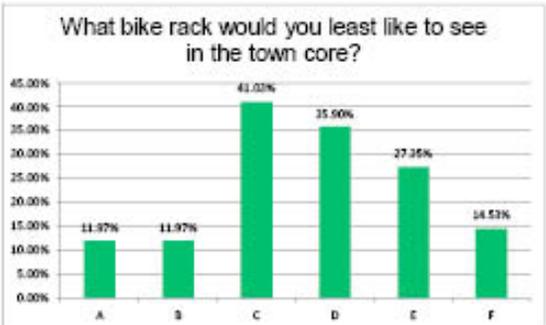


Planter A Cons	Planter B Cons	Planter C Cons	Planter D Cons	Planter E Cons	Planter F Cons
2 design	2 Design	10 design	6 design	3 design	11 shape
1 boring	1 shape	5 shape	5 shape	3 durability	7 design
1 cheap		2 color	4 color	2 shape	4 base
1 color		2 material	3 size		3 size
1 material			2 material		2 Color
1 too formal			1 boring		2 material
			1 cheap		1 boring
			1 maintenance		1 cost
			1 too modern		1 maintenance
					1 outdated
					1 too formal

# Bike Racks

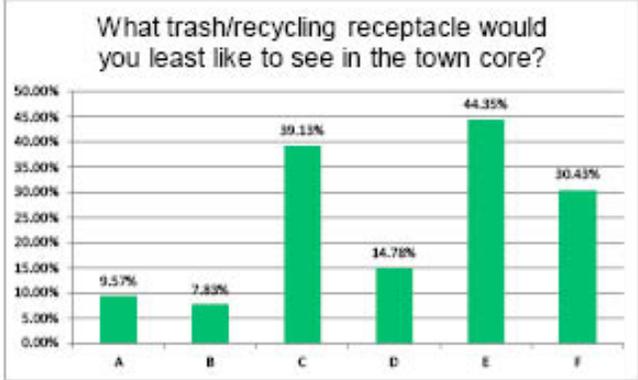
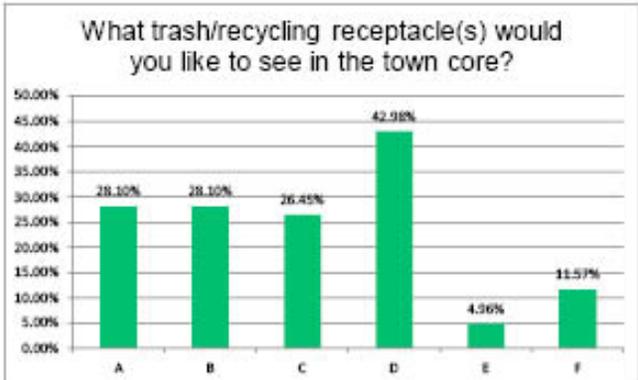


Bike Rack A Pros		Bike Rack B Pros		Bike Rack C Pros		Bike Rack D Pros		Bike Rack E Pros		Bike Rack F Pros	
11	shape	6	design	5	design	3	design	4	design	8	design
6	design	2	color	4	functional	2	color	2	functional	7	shape
6	simple	2	functional	4	simple	1	appearance	2	modern	5	simple
5	color	2	modern	2	price	1	shape	2	shape	4	color
4	recognizable	2	shape	1	shape	1	size	1	color	3	modern
3	style	1	material	1	color	1	style	1	low maintenance	2	appearance
2	classic	1	recognizable	1	flexible			1	style	2	functional
2	material	1	simple	1	fun					2	maintenance
2	practical	1	unique	1	low maintenance					2	material
2	space for multiple bikes			1	shape					2	recognizable
1	cost			1	sturdy					1	different
1	familiar									1	durable
1	functional										
1	harmony										
1	metal										
1	modern										
1	nice										
1	structured										
1	sturdy										
1	unique										
1	utilitarian										



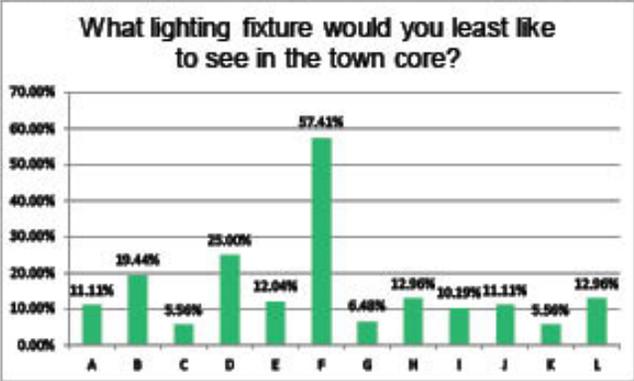
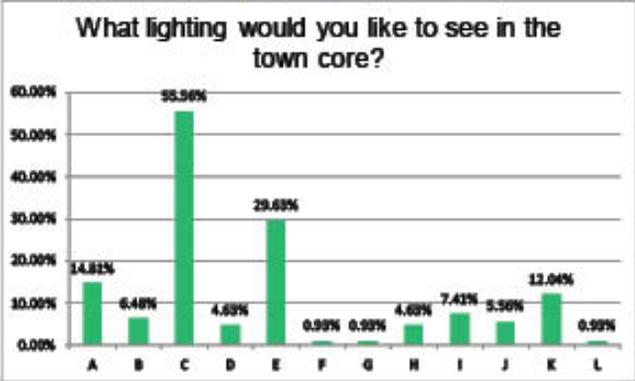
Bike Rack A Cons		Bike Rack B Cons		Bike Rack C Cons		Bike Rack D Cons		Bike Rack E Cons		Bike Rack F Cons	
3	design	2	common	22	color	19	cant hold many bikes	8	design	7	design
2	common	2	design	7	shape	7	not clear of use	8	shape	3	functionality
2	size	2	size	4	design	3	design	2	color	2	common
1	Boring	1	cheap	3	too modern	3	shape	2	dangerous	2	shape
1	cheap	1	cost	2	appearance	2	functionality	2	functionality	1	color
1	color	1	durability	1	durability	1	size	1	cheap	1	dangerous
1	Outdated	1	Simple	1	not clear of use	1	too modern	1	durability	1	material
1	plain	1	stand out	1	over-design			1	safety		
1	Simple	1	too urban	1	Simple			1	Simple		
		1	ugly	1	size						
					too retro						
				1	too small						

**TRASH AND RECYCLING**



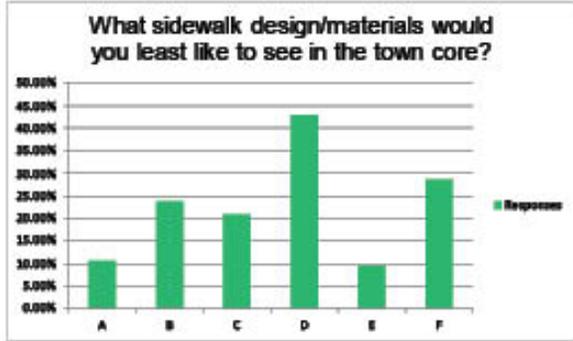
Receptacle A Pros		Receptacle B Pros		Receptacle C Pros		Receptacle D Pros		Receptacle E Pros		Receptacle F Pros	
7	design	10	material	10	recycling	10	color	3	lid/cover	5	design
6	lid	6	design	8	distinct separation	10	design	1	design	2	shape
4	style	2	color	5	all-in-one	7	shape			1	Classy
3	color	2	shape	3	colors	5	recycling			1	color
2	durable	1	classy	2	design	4	material			1	low cost
2	material	1	durable	2	shape	3	durable			1	maintenance
2	shape	1	functional	1	clean	4	functional			1	material
1	size	1	lid	1	durable	3	large opening			1	opening
				1	functional	3	maintenance			1	style
				1	simple	3	simple				
						2	style				
						1	cost				
						1	sturdy				
Receptacle A Cons		Receptacle B Cons		Receptacle C Cons		Receptacle D Cons		Receptacle E Cons		Receptacle F Cons	
4	Unattractive	2	color	10	color	4	open top	10	cheap	9	Unattractive
2	cost	2	unattractive	10	unattractive	2	design	7	color	4	design
2	style	1	boring	6	design	2	style	7	design	4	unclear use
1	maintenance	1	maintenance	5	material	1	unattractive	7	unattractive	3	cheap
1	restrictive	1	Shape	3	shape	1	cheap	7	unsanitary	1	boring
1	size			2	cheap	1	color	3	shape	1	material
				2	confusing	1	industrial	3	size	3	opening
				2	size	1	shape	2	material	1	shape
				1	busy			1	boring	1	size
				1	durability			1	dated	1	style
								1	maintenance		
								1	style		

Lighting



Lighting A Pros	Lighting B Pros	Lighting C Pros	Lighting D Pros	Lighting E Pros	Lighting F Pros	Lighting G Pros	Lighting H Pros	Lighting I Pros	Lighting J Pros	Lighting K Pros	Lighting L Pros
3 shape	3 attractive	12 shape	2 shape	6 shape	1 practical	1 design	2 design	1 attractive	2 Shape	3 style	
2 attractive	3 Wood	11 design	1 color	4 modern		1 simple	1 Cool	1 Classic	1 design	3 traditional	
2 color	1 design	8 classic	1 classic	3 simple			1 modern	1 color		2 color	
2 design	1 shape	8 color	1 LED	3 style			1 Shape	1 homey		3 design	
1 durable	1 style	8 traditional	1 match existing	2 Classic				1 modern		2 shape	
1 light cut-off		3 light cut-off		2 color				1 shape		1 classic	
1 traditional		2 attractive		2 design							
		2 style		2 material							
		1 appearance		1 attractive							
		1 cost		1 color							
		1 material		1 conservative							
		1 modern		1 light cut-off							
				1 light direction							
				1 lower energy							
				1 upscale							
Lighting A Cons	Lighting B Cons	Lighting C Cons	Lighting D Cons	Lighting E Cons	Lighting F Cons	Lighting G Cons	Lighting H Cons	Lighting I Cons	Lighting J Cons	Lighting K Cons	Lighting L Cons
4 modern	4 modern	1 dated	4 industrial	4 modern	13 modern	3 industrial	5 modern	4 modern	5 modern	2 design	7 modern
2 unattractive	3 unattractive	1 shape	4 shape	2 unattractive	10 shape	3 modern	3 shape	1 cheap	2 unattractive	1 cheap	4 Ugly
1 cost	2 material	1 urban	3 common	1 cheap	7 unattractive	2 color	2 design	1 design	1 cheap		2 shape
1 shape	2 shape		2 modern	1 design	3 design	2 shape	2 size	1 unattractive	1 design		1 cheap
1 sleek	2 style		2 boring	1 shape	3 futuristic	1 cheap	1 industrial				1 color
1 too modern	1 cheap		1 bland		2 color	1 size	1 cheap				1 unattractive
1 urban	1 common		1 cheap		2 cheap		1 color				
	1 too urban		1 color		1 contemporary		1 Ugly				
			1 unattractive		1 maintenance						
					1 material						
					1 bulky						

# Sidewalks



Sidewalks A Pros	Sidewalks B Pros	Sidewalks C Pros	Sidewalks D Pros	Sidewalks E Pros	Sidewalks F Pros
13 brick	9 matches	4 mixed material	3 Like them all	7 mixed materials	3 like them all
11 material	6 grass	3 like them all	3 material	5 brick	3 planters
7 attractive	3 like them all	2 design	1 buffer	4 attractive	1 cost
4 classic	2 attractive	1 attractive	1 classic	4 material	1 interesting
3 color	2 classic	1 balance	1 Classy	3 like them all	1 material
3 Like All	2 cost	1 color	1 cost	3 planters	1 open
3 open	2 material	1 durable	1 wide	2 classic	1 trees
3 trees	2 trees	1 planters		2 greenery	
2 maintenance	1 buffer	1 safe		2 maintenance	
2 shape	1 design			2 wide	
1 buffer	1 durable			1 colors	
1 planter	1 inviting			1 Cool	
1 safe	1 maintenance			1 cost	
1 texture	1 open			1 modern	
	1 rural			1 style	
	1 safe			1 trees	
	1 shape			1 unique	
	1 simple				
Sidewalks A Cons	Sidewalks B Cons	Sidewalks C Cons	Sidewalks D Cons	Sidewalks E Cons	Sidewalks F Cons
3 uneven	7 boring	6 too much concrete	9 too much concrete	3 colors	3 boring
2 cost	4 plain	4 needs plants	4 unattractive	2 cost	3 narrow
1 boring	2 color	2 bland	3 busy	2 too much concrete	2 bland
1 doesn't fit in	2 material	1 cost	3 color	1 material	2 plain
1 more grass	2 shape	1 design	3 needs plants	1 more grass	2 too narrow
1 repetitive	1 maintenance	1 generic	2 bland	1 wasteful	1 big city
	1 narrow	1 no buffer	2 design		1 big cracks
	1 not classic	1 old	1 cost		1 common
	1 road width	1 shape	1 doesn't fit in		1 crowded
	1 sloppy	1 too urban	1 material		1 dated
			1 mixed materials		1 durability
			1 original		1 hard
			1 shape		1 maintenance
			1 slippery		1 too much concrete
			1 too fancy		1 unattractive

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**Do you have any additional comments on design features or styles you would like to see in the town core?**

- 5 bike lanes
- 5 classic
- 5 keep historical
- 3 flowers/trees/planters
- 3 low maintenance
- 3 public art
- 3 roundabout
- 3 sidewalks
- 3 small town feel
- 2 green space
- 2 landscaping
- 2 signage
- 2 simple
- 2 traditional
- 1 artificial turf in park
- 1 black metal
- 1 brick
- 1 consistency
- 1 crosswalks
- 1 diversify from brick and white
- 1 dog waste stations
- 1 don't skimp
- 1 don't want streetscape updates
- 1 extend sidewalks
- 1 farmer markets

- 1 honor the horse
- 1 inviting
- 1 lighting
- 1 low cost
- 1 no options represent historical feel
- 1 rustic look
- 1 sleek minimalist
- 1 trails
- 1 underground utilities
- 1 village style
- 1 water fountains
- 1 white lights on trees

### Appendix B: Recommended Traffic Signs & Markings

This appendix provides detailed information about the recommended signs and markings including descriptions, designs, guidance information (if available). Information provided here is for reference only, and final roadway signs or markings should be evaluated by a professional engineer before installation. Unless otherwise noted, the primary source referenced is the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) by the Federal Highway Administration (FHWA).

#### Shared Lane Marking or “Sharrows”

Shared Lane Markings (sharrows) assist bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of a bicyclist’s impacting the open door of a parked vehicle; assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane; alert road users of the lateral location bicyclists are likely to occupy within the traveled way; encourage safe passing of bicyclists by motorists; and reduce the incidence of wrong-way bicycling.

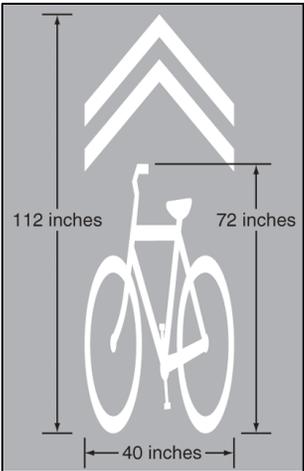


Image Source: Urban Bikeway Design Guide, NACTO (2014)

MUTCD Description: This figure illustrates an example of a lane marked for bicycle shared use. The figure shows a vertical symbol of a bicycle with a white "v" shaped marking inside a second "v" shape above the symbol. The points of the "v" shaped markings face up. The distance from the top of the topmost "v" shaped marking to the bottom of the bicycle symbol is shown as a dimension of 112 inches. The overall length of the symbol is shown as a dimension of 72 inches. The overall width of the symbol is shown as a dimension of 40 inches.

MUTCD Guidance: The Shared Lane Marking should not be placed on roadways that have a speed limit above 35 mph. If used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the centers of the Markings should be at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb. In addition, if used, the Markings should be placed immediately after an intersection and spaced at intervals not greater than 250 feet thereafter.

#### Advance Signing (Pedestrian)

Advance signing is used to provide additional notification to drivers that a crosswalk is near and pedestrians may be crossing the roadway. Advance signing is particularly useful at locations where a crosswalk might be unexpected by approaching drivers. (Source: TCRP Report 112/NCHRP Report 562).



W11-2

W16-9P

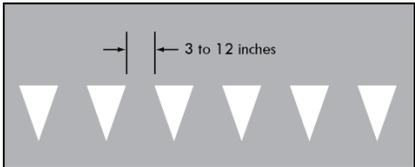


MUTCD Description: Non-Vehicular Warning signs may be used to alert road users in advance of locations where unexpected entries into the roadway might occur or where shared use of the roadway by pedestrians, animals, or equestrians might occur. When used in advance of a pedestrian, snowmobile, or equestrian crossing, the signs should be supplemented with plaques with the legend AHEAD or XX FEET to inform road users that they are approaching a point where crossing activity might occur.

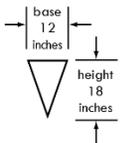
MUTCD Guidance: When a fluorescent yellow-green background is used, a systematic approach featuring one background color within a zone or area should be used. The mixing of standard yellow and fluorescent yellow-green backgrounds within a selected site area should be avoided. Non-vehicular signs should be used only at locations where the crossing activity is unexpected or at locations not readily apparent.

Advance Yield Line and Sign (Pedestrian)

At midblock crossings and signalized or stop-controlled approaches to intersections, the vehicle yield line can be moved farther back from the pedestrian crosswalk for an improved factor of safety and for improved visibility of pedestrians.



Minimum Dimensions



R1-5



R1-5a



FHWA Ped Facilities Users Guide Description: Advance yield lines allow pedestrians and drivers to have a clearer view of each other and more time in which to assess intentions. The effectiveness of this tool depends upon whether motorists are likely to obey the stop line, which varies. In some places, the yield line has been moved back by 15 to 30 feet (4.6 to 9.1 m) relative to the marked crosswalk with considerable safety benefits for pedestrians.

MUTCD Guidance: If used, yield lines should be placed a minimum of 4 feet (1.2 m) in advance of the nearest crosswalk line at controlled intersections. If used at an un-signalized midblock crosswalk, yield lines should be placed adjacent to the Yield Here to Pedestrian sign located 20 to 50 feet (6.1 to 15 m) in advance of the nearest crosswalk line, and parking should be prohibited in the area between the yield line and the crosswalk.

**Hi-Visibility Crosswalk (Ladder Crossing)**

Markings guide pedestrians who are crossing roadways by defining and delineating paths on approaches to and within signalized intersections, and on approaches to other intersections where traffic stops. They also alert road users of a pedestrian crossing point across roadways not controlled by signals

or stop signs. At non-intersection locations, markings legally establish the crosswalk. Specific guidance on the use of marked crosswalks is provided in FHWA-RD-01-075. These FHWA guidelines may be used as a supplement to the guidelines for marked crosswalks presented here. (Source: TCRP Report 112/NCHRP Report 562)



MUTCD Markings Guidance: Crosswalks should be no less than 6 feet (1.8 m) wide. Crosswalk lines should extend across the full width of the pavement.

Crosswalks should be marked at all intersections with “substantial conflict” between vehicles and pedestrians.

FHWA Markings Guidelines: Marked crosswalks alone should not be installed at un-signalized pedestrian crossings when speeds are greater than 40 mph.

MUTCD Markings Standard: When crosswalk lines are used, they shall consist of solid white lines that shall not be less than 6 in nor greater than 24 in wide.

### **In-Street Crossing Signs (Pedestrian)**

In-Street Pedestrian Crossing signs are regulatory signs placed in the street (on lane edge lines and road centerlines, or in medians). In-Street Pedestrian Crossing signs are described in the 2003 Manual of Uniform Traffic Control Devices, in Section 2B.12.

The In-Street Pedestrian Crossing sign (R1-6 or R1-6a) may be used to remind road users of laws regarding the right of way at an un-signalized pedestrian crossing. The legend STATE LAW may be shown at the top of the sign if applicable. The legends STOP FOR or YIELD TO may be used in conjunction with the appropriate symbol. (Source: TCRP Report 112/NCHRP Report 562).



R1-6



MUTCD Standard: The In-Street Pedestrian Crossing sign shall not be used at signalized locations. The STOP FOR legend shall only be used in states where the state law specifically requires that a driver must stop for a pedestrian in a crosswalk. If used, the In-Street Pedestrian Crossing sign shall have a black legend (except for the red STOP or YIELD sign symbols) and border on either a white and/or fluorescent yellow-green background. If the In-Street Pedestrian Crossing sign is placed in the roadway, the sign support shall comply with the breakaway requirements of the latest edition of AASHTO’s specifications.

MUTCD Guidance: If an island is available, the In-Street Pedestrian Crossing sign, if used, should be placed on the island.

MUTCD Option: The In-Street Pedestrian Crossing sign may be used seasonally to prevent damage in winter because of plowing operations and may be removed at night if the pedestrian activity at night is minimal.

Crossing Signs (Pedestrian)

Pedestrian crossing signs (W11-2 and W16-7P) may be used to alert road users in advance of locations where unexpected entries into the roadway or shared use of the roadway by pedestrians may occur.



W11-2



W16-7P

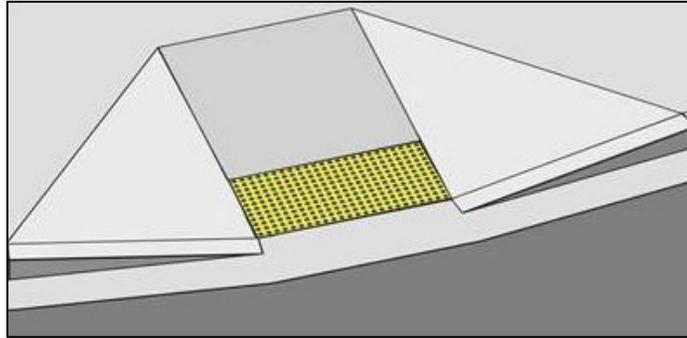


MUTCD Signs Guidance: When used in advance of a crossing, the W11-2 sign may have a supplemental plaque with the legend AHEAD or XX FEET to provide advance notice to road users of crossing activity.

MUTCD Signs Standard: When used at crossings, pedestrian crossing signs shall be supplemented with a diagonal downward-pointing arrow plaque showing the location of the crossing.

### Detectable Warnings (Pedestrian)

Detectable warnings are a distinctive surface pattern of domes detectable by cane or underfoot that alert persons with vision impairments of their approach to street crossings and hazardous drop-offs. They are used to indicate the boundary between pedestrian and vehicular routes where there is a flush instead of a curbed connection. (Source: United States Access Board).



### Driveway Improvements

Several driveway design characteristics may cause safety and access problems for pedestrians, including excessively wide and/or sloped driveways, driveways with large turning radii, multiple adjacent driveways, driveways that are not well defined, and driveways where motorist attention is focused on finding a gap in congested traffic.

When driveways cross sidewalks, the sidewalk should be delineated across the driveway (e.g., if the sidewalk is composed of concrete, the concrete surface treatment should be continuous across the driveway) to make it clear to motorists that they must watch for pedestrians. Additionally, it is necessary to maintain a sidewalk level across the driveway with no more than 2 percent cross slope to safely accommodate pedestrians in wheelchairs and other mobility devices and to comply with ADA standards.

As a general rule, driveways should be designed to look like driveways, not roadway intersections. However, in locations where a driveway must function as part of an intersection, it should be designed with pedestrian safety features such as crosswalks, small corner radii, and pedestrian signal heads if signalized.

(Source: <http://www.pedbikesafe.org/PEDSAFE>)

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### Rectangular Rapid Flash Beacon (RRFB)

Rectangular Rapid Flash Beacons (RRFB) can enhance safety by reducing crashes between vehicles and pedestrians at un-signalized intersections and mid-block pedestrian crossings by increasing driver awareness of potential pedestrian conflicts.

RRFBs are user-actuated amber LEDs that supplement warning signs at un-signalized intersections or mid-block crosswalks. They can be activated by pedestrians manually by a push button or passively by a pedestrian detection system. RRFBs use an irregular flash pattern that is similar to emergency flashers on police vehicles. RRFBs may be installed on either two-lane or multi-lane roadways.

(Source: [http://safety.fhwa.dot.gov/intersection/conventional/unsignalized/tech\\_sum/fhwas09009](http://safety.fhwa.dot.gov/intersection/conventional/unsignalized/tech_sum/fhwas09009))



Image Source: [www.carmandh.com](http://www.carmandh.com)

The RRFB design differs from the standard flashing beacon by utilizing: A rapid flashing frequency (approximately 190 times per minute), a brighter light intensity, and ability to aim the LED lighting. The final design, placement, and operation of RRFBs should be in accordance with FHWA's "Interim Approval 21 – Rectangular Rapid-Flashing Beacons at Crosswalks" from March 2018.

### Appendix C: Design Guidelines

General design guidelines for bicycle and pedestrian facilities, as well as typical cross-sections, are linked below. NCDOT adheres to these guidelines and the state Complete Streets guidelines in its design of bicycle and pedestrian facilities. NCDOT has made these guidelines and resources available here: <https://connect.ncdot.gov/projects/BikePed/pages/guidance.aspx>. The table below summarizes these resources and provides links.

Document	Link
<b>American Association of State Highway and Transportation Officials (AASHTO)</b>	
Guide for the Development of Bicycle Facilities	<a href="https://bookstore.transportation.org/Item_details.aspx?id=1943">https://bookstore.transportation.org/Item_details.aspx?id=1943</a>
Guide for the Planning, Design, and Operations of Pedestrian Facilities	<a href="https://bookstore.transportation.org/item_details.aspx?id=119">https://bookstore.transportation.org/item_details.aspx?id=119</a>
<b>Federal Highway Administration (FHWA)</b>	
Accessibility Guidance	<a href="https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/index.cfm">https://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/index.cfm</a>
Design Guidance	
Facility Guidance	
Facility Operations	
Small Towns and Rural Multimodal Networks Guide	<a href="https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/">https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/small_towns/</a>
<b>Manual on Uniform Traffic Control Devices (MUTCD)</b>	
Part 4E: Pedestrian Control Features	<a href="https://mutcd.fhwa.dot.gov/htm/2003r1r2/part4/part4e.htm">https://mutcd.fhwa.dot.gov/htm/2003r1r2/part4/part4e.htm</a>
Part 7: Traffic Controls for School Areas	<a href="https://mutcd.fhwa.dot.gov/htm/2003r1r2/part7/part7-toc.htm">https://mutcd.fhwa.dot.gov/htm/2003r1r2/part7/part7-toc.htm</a>
Part 9: Traffic Controls for Bicycle Facilities	<a href="https://mutcd.fhwa.dot.gov/htm/2003r1r2/part9/part9-toc.htm">https://mutcd.fhwa.dot.gov/htm/2003r1r2/part9/part9-toc.htm</a>
2009 NC Supplement to MUTCD	<a href="https://connect.ncdot.gov/resources/safety/TrafficSafetyResources/2009%20NC%20Supplement%20to%20MUTCD.pdf">https://connect.ncdot.gov/resources/safety/TrafficSafetyResources/2009%20NC%20Supplement%20to%20MUTCD.pdf</a>

<b>National Association of City Transportation Officials (NACTO)</b>	
Urban Bikeway Design Guide	<a href="https://nacto.org/publication/urban-bikeway-design-guide/">https://nacto.org/publication/urban-bikeway-design-guide/</a>
Urban Street Design Guide	<a href="https://nacto.org/publication/urban-street-design-guide/">https://nacto.org/publication/urban-street-design-guide/</a>
<b>Safe Routes to School (SRTS) Non-Infrastructure</b>	
National Center for Safe Routes to School	<a href="http://www.saferoutesinfo.org/">http://www.saferoutesinfo.org/</a>
National Partnership for Safe Routes to School	<a href="http://www.saferoutespartnership.org/">http://www.saferoutespartnership.org/</a>
<b>US Access Board</b>	
ABA Accessibility Standards	<a href="https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/guide-to-the-aba-standards/single-file-version">https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-aba-standards/guide-to-the-aba-standards/single-file-version</a>
ADA Accessibility Guidelines	<a href="https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/ada-aba-accessibility-guidelines-2004">https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/ada-aba-accessibility-guidelines-2004</a>
ADA Accessibility Standards	<a href="https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards">https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards</a>
Public Rights-of-Way, Streets & Sidewalks, and Shared Use Paths	<a href="https://www.access-board.gov/guidelines-and-standards/streets-sidewalks">https://www.access-board.gov/guidelines-and-standards/streets-sidewalks</a>
<b>North Carolina Department of Transportation (NCDOT)</b>	
Statewide Pedestrian and Bicycle Plan	<a href="https://www.ncdot.gov/bikeped/walkbikenc/#toolbox">https://www.ncdot.gov/bikeped/walkbikenc/#toolbox</a>
Glossary of North Carolina Terminology for Active Transportation	<a href="https://connect.ncdot.gov/projects/BikePed/Documents/NC%20Terminology%20for%20Active%20Travel.pdf">https://connect.ncdot.gov/projects/BikePed/Documents/NC%20Terminology%20for%20Active%20Travel.pdf</a>
NCDOT Complete Streets	<a href="http://www.completestreetsnc.org/">http://www.completestreetsnc.org/</a>
Evaluating Temporary Accommodations for Pedestrians	<a href="https://connect.ncdot.gov/projects/wztc/Documents/AccomPedinWZProc.pdf">https://connect.ncdot.gov/projects/wztc/Documents/AccomPedinWZProc.pdf</a>
NC Local Programs Handbook	<a href="https://connect.ncdot.gov/municipalities/Funding/Pages/LPM%20Handbook.aspx/">https://connect.ncdot.gov/municipalities/Funding/Pages/LPM%20Handbook.aspx/</a>
Traditional Neighborhood Development Guidelines	<a href="https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Traditional%20Neighborhood%20Development%20Manual.pdf">https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Traditional%20Neighborhood%20Development%20Manual.pdf</a>

Source: NCDOT Division of Bicycle and Pedestrian Transportation, <https://connect.ncdot.gov/projects/BikePed/pages/guidance.aspx>

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## Appendix D: Funding Resources

### State Funding Sources

#### *NCDOT State Transportation Improvement Program*

Passed in 2013, the Strategic Transportation Investments law (STI) allows NCDOT to use its funding more efficiently and effectively to enhance the state's infrastructure, while supporting economic growth, job creation and a higher quality of life. This process encourages thinking from a statewide and regional perspective while also providing flexibility to address local needs.

STI also establishes the Strategic Mobility Formula, a new way of allocating available revenues based on data-driven scoring and local input. The formula includes three funding categories – Statewide Mobility, Regional Impact and Division Needs – with bicycle and pedestrian projects only eligible within the Division Needs category. Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), and NCDOT Divisions may submit projects through the prioritization process.

Independent bicycle and pedestrian projects (shared-use paths, bike lanes, sidewalks, intersection improvements, etc.) are comparatively evaluated and ranked based on a range of criteria and compete with projects from all other transportation modes.

For more information, visit:

<https://www.ncdot.gov/strategictransportationinvestments/>

#### *Incidental Projects*

Bicycle and pedestrian accommodations such as bike lanes, sidewalks, intersection improvements, widened paved shoulders and bicycle and pedestrian-safe bridge design are frequently included as incidental features of highway projects. In addition, bicycle-safe drainage grates are a standard feature of all highway construction. 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.

#### *Spot Safety Program*

The Spot Safety Program is used to develop smaller improvement projects to address safety, potential safety, and operational issues. The program is

funded with state funds and currently receives approximately \$9 million per state fiscal year. Other monetary sources (such as Small Construction or Contingency funds) can assist in funding Spot Safety projects, however, the maximum allowable contribution of Spot Safety funds per project is \$250,000. 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, delay, congestion, number of signal warrants met, effect on pedestrians and schools, division and region priorities, and public interest

#### *Hazard Elimination Program*

The Hazard Elimination Program is used to develop larger improvement projects to address safety and potential safety issues. The program is funded with 90% federal funds and 10% state funds. The cost of Hazard Elimination Program projects typically ranges between \$400,000 and \$1 million. A Safety Oversight Committee (SOC) reviews and recommends Hazard Elimination projects to the Board of Transportation (BOT) for approval and funding. These projects are prioritized for funding according to a safety benefit to cost (B/C) ratio, with the safety benefit being based on crash reduction. Once approved and funded by the BOT, these projects become part of the department's State Transportation Improvement Program (STIP).

#### *Governor's Highway Safety Program*

The mission of the Governor's Highway Safety Program (GHSP) is to promote highway safety awareness and reduce the number of traffic crashes in the state of North Carolina through the planning and execution of safety programs. GHSP funding is provided through an annual program, upon approval of specific project requests. Amounts of GHSP funds vary from year to year, according to the specific amounts requested. Communities may apply for a GHSP grant to be used as seed money to start a program to enhance highway safety. Once a grant is awarded, funding is provided on a reimbursement basis. Evidence of reductions in crashes, injuries, and fatalities is required.

For more information, visit: <https://www.ncdot.gov/programs/ghsp/>

### *Bicycle and Pedestrian Planning Grant Initiative*

To encourage the development of comprehensive local bicycle plans and pedestrian plans, the NCDOT Division of Bicycle and Pedestrian Transportation (DBPT) and the Transportation Planning Branch (TPB) have created a matching grant program to fund plan development. This program was initiated through a special allocation of funding approved by the North Carolina General Assembly in 2003 along with federal funds earmarked specifically for bicycle and pedestrian planning by the TPB. The planning grant program was launched in January 2004, and it is currently administered through NCDOT-DBPT. Over the past thirteen grant cycles, 173 municipal plans have been selected and funded from 411 applicants. A total of almost \$4.6 million has been allocated. Funding for 2017 is approximately \$400,000. Additional annual allocations will be sought for subsequent years.

For more information, visit:

<https://connect.ncdot.gov/municipalities/PlanningGrants/Pages/Planning-Grant-Initiative.aspx>

### *Eat Smart, Move More North Carolina Community Grants*

The Eat Smart, Move More Community Grants Program supported local health departments in North Carolina in their efforts to develop community-based interventions that encourage, promote and facilitate physical activity and healthy eating. The purpose of the program was to provide funding to local communities to implement strategies that advance the goals and objectives of North Carolina's Obesity Prevention Plan. Through Nutrition, Physical Activity and Obesity funding from the Centers for Disease Control and Prevention, the North Carolina Division of Public Health successfully administered over 199 community grants. In the past, funds have been used to conduct educational programs and construct trails.

For more information, visit:

<http://www.eatsmartmovemorenc.com/Funding/CommunityGrants.html>

### *State Street-Aid (Powell Bill) Program*

Annually, State street-aid (Powell Bill) allocations are made to incorporated municipalities which establish their eligibility and qualify as provided by statute. This program is a state grant to municipalities for the purposes of maintaining, repairing, constructing, reconstructing or widening of local streets that are the responsibility of the municipalities or for

planning, construction, and maintenance of bikeways or sidewalks along public streets and highways. Funding for this program is collected from fuel taxes. Amount of funds are based on population and mileage of town-maintained streets.

For more information, visit:

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

### *Community Development Block Grant*

Community Development Block Grant (CDBG) funds are available to local municipal or county governments for projects to enhance the vitality of communities by providing decent housing and suitable living environments and expanding economic opportunities. These grants primarily serve persons of low- and moderate- incomes. State CDBG funds are provided by the U.S. Department of Housing and Urban Development (HUD) to the state of North Carolina. Some urban counties and cities in North Carolina receive CDBG funding directly from HUD.

The primary statutory objective of the CDBG program is to develop viable communities by providing decent housing and a suitable living environment and by expanding economic opportunities. These grants primarily serve persons of low- and moderate-income, as the State must ensure that at least 70 percent of its CDBG grant funds are used for activities that benefit these persons.

The State typically receives about \$45 million in federal CDBG funds annually to go towards various CDBG program categories that have been designed to meet the needs of North Carolina's communities. Local governments may apply for these funds.

For more information, visit: <https://www.nccommerce.com/rd/state-cdbg>

### *Safe Routes to School Program*

Safe Routes to School (SRTS) is a program that enables and encourages children to walk and bicycle to school; makes walking and bicycling to school a safe and more appealing transportation option, and facilitates the planning, development and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of school.

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For more information, visit:

<https://www.ncdot.gov/bikeped/safetyeducation/safeRoutesToSchools/>.

#### *Urban and Community Forestry Grant*

The North Carolina Division of Forest Resources Urban and Community Forestry grant makes available funding for a variety of projects that will provide for both the establishment of trees both along streets and urban open spaces. Funding will not be provided for entertainment, food and beverages, computers, tree maintenance, or construction and landscape supplies/equipment.

Any unit of local or state government, public educational institution, or IRS approved non-profit 501(c)(3) and other tax-exempt organizations may apply for grants yearly, although when funding is limited and project merits are solid, a first-time applicant may be selected before a repeat applicant. Repeat applicants should submit projects that are wholly new or that build upon previous grants projects and demonstrate a progression towards a self-sustaining urban forestry program. Grant funding is not meant to replace funding for current programs, such as planting, maintenance or staffing. Grant requests can range from \$2,500 to \$15,000.

Grants are awarded on an annual basis through the USDA Forest Service and are administered by the NC Forest Service U&CF Program. The grant provides 50% of the project costs, and requires matching funds or in-kind efforts, to encourage resident involvement in creating and sustaining urban and community forestry programs. First-time municipal applicants and municipalities seeking Tree City USA status are given priority for funding.

For more information, visit:

[http://www.ncforestservice.gov/Urban/urban\\_grant\\_overview.htm](http://www.ncforestservice.gov/Urban/urban_grant_overview.htm)

#### **Local Funding Sources**

Municipalities often plan for the funding of pedestrian facilities or improvements through development of Capital Improvement Programs (CIP). In Raleigh, for example, the greenways system has been developed over many years through a dedicated source of annual funding that has ranged from \$100,000 to \$500,000, administered through the Recreation and Parks Department. CIPs should include all types of capital improvements (water, sewer, buildings, streets, etc.) versus programs for single purposes. This allows municipal decision-makers to balance all capital needs. Typical capital funding mechanisms include the following:

capital reserve fund, capital protection ordinances, municipal service district, tax increment financing, taxes, fees, and bonds. Each of these categories are described below.

#### *Capital Reserve Fund*

Municipalities have statutory authority to create capital reserve funds for any capital purpose, including pedestrian facilities. The reserve fund must be created through ordinance or resolution that states the purpose of the fund, the duration of the fund, the approximate amount of the fund, and the source of revenue for the fund. Sources of revenue can include general fund allocations, fund balance allocations, grants and donations for the specified use.

#### *Capital Project Ordinances*

Municipalities can pass Capital Project Ordinances that are project specific. The ordinance identifies and makes appropriations for the project.

#### *Municipal Service District*

Municipalities have statutory authority to establish municipal service districts, to levy a property tax in the district additional to the citywide property tax, and to use the proceeds to provide services in the district. Downtown revitalization projects are one of the eligible uses of service districts.

#### *Tax Increment Financing*

Tax increment financing is a tool to use future gains in taxes to finance the current improvements that will create those gains. When a public project, such as the construction of a greenway, is carried out, there is an increase in the value of surrounding real estate. Oftentimes, new investment in the area follows such a project. This increased value and investment creates more taxable property, which increases tax revenues. These increased revenues can be referred to as the "tax increment." Tax Increment Financing dedicates that increased revenue to finance debt issued to pay for the project. TIF is designed to channel funding toward improvements in distressed or underdeveloped areas where development would not otherwise occur. TIF creates funding for public projects that may otherwise be unaffordable to localities. The large majority of states have enabling legislation for tax increment financing.

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### *Installment Purchase Financing*

As an alternative to debt financing of capital improvements, communities can execute installment/ lease purchase contracts for improvements. This type of financing is typically used for relatively small projects that the seller or a financial institution is willing to finance or when up-front funds are unavailable. In a lease purchase contract the community leases the property or improvement from the seller or financial institution. The lease is paid in installments that include principal, interest, and associated costs. Upon completion of the lease period, the community owns the property or improvement. While lease purchase contracts are similar to a bond, this arrangement allows the community to acquire the property or improvement without issuing debt. These instruments, however, are more costly than issuing debt.

### *Taxes*

Many communities have raised money through self-imposed increases in taxes and bonds. For example, Pinellas County residents in Florida voted to adopt a one-cent sales tax increase, which provided an additional \$5 million for the development of the overwhelmingly popular Pinellas Trail. Sales taxes have also been used in Allegheny County, Pennsylvania, and in Boulder, Colorado to fund open space projects. A gas tax is another method used by some municipalities to fund public improvements. A number of taxes provide direct or indirect funding for the operations of local governments. Some of them are:

#### *Sales Tax*

In North Carolina, the state has authorized a sales tax at the state and county levels. Local governments that choose to exercise the local option sales tax (all counties currently do), use the tax revenues to provide funding for a wide variety of projects and activities. Any increase in the sales tax, even if applying to a single county, must gain approval of the state legislature. In 1998, Mecklenburg County was granted authority to institute a one-half cent sales tax increase for mass transit.

#### *Property Tax*

Property taxes generally support a significant portion of a municipality's activities. However, the revenues from property taxes can also be used to pay debt service on general obligation bonds issued to finance greenway system acquisitions. Because of limits imposed on tax rates, use of property taxes to fund greenways could limit the municipality's ability to raise funds

for other activities. Property taxes can provide a steady stream of financing while broadly distributing the tax burden. In other parts of the country, this mechanism has been popular with voters as long as the increase is restricted to parks and open space. Note, other public agencies compete vigorously for these funds, and taxpayers are generally concerned about high property tax rates.

#### *Excise Taxes*

Excise taxes are taxes on specific goods and services. These taxes require special legislation and the use of the funds generated through the tax are limited to specific uses. Examples include lodging, food, and beverage taxes that generate funds for promotion of tourism, and the gas tax that generates revenues for transportation related activities.

#### *Occupancy Tax*

The NC General Assembly may grant towns the authority to levy occupancy tax on hotel and motel rooms. The act granting the taxing authority limits the use of the proceeds, usually for tourism-promotion purposes.

#### *Fees*

Three fee options that have been used by local governments to assist in funding pedestrian and bicycle facilities are listed here:

#### *Stormwater Utility Fees*

Greenway sections may be purchased with stormwater fees, if the property in question is used to mitigate floodwater or filter pollutants.

Stormwater charges are typically based on an estimate of the amount of impervious surface on a user's property. Impervious surfaces (such as rooftops and paved areas) increase both the amount and rate of stormwater runoff compared to natural conditions. Such surfaces cause runoff that directly or indirectly discharge into public storm drainage facilities and creates a need for stormwater management services. Thus, users with more impervious surface are charged more for stormwater service than users with less impervious surface. The rates, fees, and charges collected for stormwater management services may not exceed the costs incurred to provide these services. The costs that may be recovered through the stormwater rates, fees, and charges includes any costs necessary to assure that all aspects of stormwater quality and quantity are managed in accordance with federal and state laws, regulations, and rules.

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### Streetscape Utility Fees

Streetscape Utility Fees could help support streetscape maintenance of the area between the curb and the property line through a flat monthly fee per residential dwelling unit. Discounts would be available for senior and disabled residents. Non-residential customers would be charged a per foot fee based on the length of frontage on streetscape improvements. This amount could be capped for non-residential customers with extremely large amounts of street frontage. The revenues raised from Streetscape Utility fees would be limited by ordinance to maintenance (or construction and maintenance) activities in support of the streetscape.

### Exactions

Exactions are similar to impact fees in that they both provide facilities to growing communities. The difference is that through exactions it can be established that it is the responsibility of the developer to build the greenway or pedestrian facility that crosses through the property, or adjacent to the property being developed.

### In-Lieu-Of Fees

As an alternative to requiring developers to dedicate on-site greenway sections that would serve their development, some communities provide a choice of paying a front-end charge for off-site protection of pieces of the larger system. Payment is generally a condition of development approval and recovers the cost of the off-site land acquisition or the development's proportionate share of the cost of a regional facility serving a larger area. Some communities prefer in-lieu-of fees. This alternative allows community staff to purchase land worthy of protection rather than accept marginal land that meets the quantitative requirements of a developer dedication but falls a bit short of qualitative interests.

### Bonds and Loans

Bonds have been a very popular way for communities across the country to finance their pedestrian and greenway projects. A number of bond options are listed below. Contracting with a private consultant to assist with this program may be advisable. Since bonds rely on the support of the voting population, an education and awareness program should be implemented prior to any vote. Billings, Montana used the issuance of a bond in the amount of \$599,000 to provide the matching funds for several of their TEA-21 enhancement projects. Austin, Texas has also used bond issues to fund a portion of their bicycle and trail system.

### Revenue Bonds

Revenue bonds are bonds that are secured by a pledge of the revenues from a certain local government activity. The entity issuing bonds, pledges to generate sufficient revenue annually to cover the program's operating costs, plus meet the annual debt service requirements (principal and interest payment). Revenue bonds are not constrained by the debt ceilings of general obligation bonds, but they are generally more expensive than general obligation bonds.

### General Obligation Bonds

Cities, counties, and service districts generally are able to issue general obligation (G.O.) bonds that are secured by the full faith and credit of the entity. In this case, the local government issuing the bonds pledges to raise its property taxes, or use any other sources of revenue to make the debt service payments on the bonds. A general obligation pledge is stronger than a revenue pledge, and thus may carry a lower interest rate than a revenue bond. Frequently, when local governments issue G.O. bonds for public enterprise improvements, the public enterprise will make the debt service payments on the G.O. bonds with revenues generated through the public entity's rates and charges. However, if those rate revenues are insufficient to make the debt payment, the local government is obligated to raise taxes or use other sources of revenue to make the payments. G.O. bonds distribute the costs of land acquisition and greenway development and make funds available for immediate purchases and projects. Voter approval is required.

### Special Assessment Bonds

Special assessment bonds are secured by a lien on the property that benefits by the improvements funded with the special assessment bond proceeds. Debt service payments on these bonds are funded through annual assessments to the property owners in the assessment area.

### State Revolving Fund (SRF) Loans

Initially funded with federal and state money, and continued by funds generated by repayment of earlier loans, State Revolving Funds (SRFs) provide low interest loans for local governments to fund water pollution control and water supply related projects including many watershed management activities. These loans typically require a revenue pledge, like a revenue bond, but carry a below market interest rate and limited term for debt repayment (20 years).

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## Other Local Options

### Facility Maintenance Districts

Facility Maintenance Districts (FMDs) can be created to pay for the costs of on-going maintenance of public facilities and landscaping within the areas of the Town where improvements have been concentrated and where their benefits most directly accrue to business and institutional property owners. An FMD may be needed to assure a sustainable maintenance program. Fees may be based upon the length of lot frontage along streets where improvements have been installed, or upon other factors such as the size of the parcel. The program supported by the FMD should include regular maintenance of streetscapes and off road trail improvements. The municipality can initiate public outreach efforts to merchants, the Chamber of Commerce, and property owners. In these meetings, Town staff will discuss the proposed apportionment and allocation methodology and will explore implementation strategies. The municipality can manage maintenance responsibilities either through its own staff or through private contractors.

### Partnerships

Another method of funding pedestrian improvements is to partner with public agencies and private companies and organizations. Partnerships engender a spirit of cooperation, civic pride and community participation. The key to the involvement of private partners is to make a compelling argument for their participation. Major employers, developers, and health systems should be identified and provided with a “Benefits of Walking”-type handout for themselves and their employees. Very specific routes that make critical connections to place of business would be targeted for private partners’ monetary support following a successful master planning effort. Potential partners include major employers which are located along or accessible to pedestrian facilities such as shared-use paths or greenways. Name recognition for corporate partnerships would be accomplished through signage trail heads or interpretive signage along greenway systems. Utilities often make good partners and many trails now share corridors with them. Money raised from providing an easement to utilities can help defray the costs of maintenance. It is important to have a lawyer review the legal agreement and verify ownership of the subsurface, surface or air rights in order to enter into an agreement.

## Private & Non-Profit Funding

### The Robert Wood Johnson Foundation

The Robert Wood Johnson Foundation was established in 1972 and is the largest United States foundation devoted to improving the health care of all Americans. The foundation works to help achieve health equity and expand opportunity to pursue the best health possible through investments in four broad areas: Healthy Communities; Healthy Kids, Health Weight; Health Leadership; and Health Systems.

For more information, visit: <http://www.rwjf.org/>

### North Carolina Community Foundation

According to their website, “The NCCF is the single statewide community foundation serving North Carolina and has made \$101 million in grants since its inception in 1988. With more than \$237 million in assets, the NCCF sustains 1,200 endowments established to provide long-term support of a broad range of community needs, nonprofit organizations, institutions and scholarships. The NCCF partners with 60 affiliate foundations to provide local resource allocation and community assistance in 67 counties across the state. An important component of the NCCF’s mission is to ensure that rural philanthropy has a voice at local, regional and national levels.”

For more information, visit: <http://www.nccommunityfoundation.org/>

### Walmart State Giving Program

According to their website, “The Walmart Foundation’s State Giving Program plays an essential role in the Foundation’s mission to create opportunities so people can live better. The Program provides grants to 501(c)(3) organizations ranging from \$25,000 to \$200,000, depending on the type of program.

The State Giving Program invests in all 50 states, Washington, D.C. and Puerto Rico. The Walmart Foundation has a State Advisory Council in each state, made up of Walmart associates representing local communities. Each Council helps identify local needs within its state, reviews all eligible grant applications and makes funding recommendations to the Walmart Foundation. Councils base recommendations on alignment with Foundation focus areas, state or community needs and program eligibility criteria. Applications are accepted during designated periods, or cycles, only. All states have two application cycles annually.

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For more information, visit: <http://giving.walmart.com/foundation>

#### *Z. Smith Reynolds Foundation*

According to the organization's website, "the Z. Smith Reynolds Foundation seeks to improve the quality of life for all North Carolinians by preventing harm to, ensuring access to and enhancing the resilience of the natural systems that sustain life. The Foundation is committed to strong and sensible environmental protection. ZSR has a particular interest in broadening the base of residents acting on behalf of the environment and supporting organizations that empower people at the grassroots to effect state and regional policy decisions. ZSR funds a wide variety of strategies to meet its environmental goals, including but not limited to: policy development, advocacy, civic engagement, communications, and litigation."

For more information, visit: <http://www.zsr.org/>

#### *Blue Cross Blue Shield of North Carolina Foundation*

The Blue Cross Blue Shield of North Carolina Foundation focuses on programs that use an outcome approach to improve the health and well-being of residents. The Healthy Living grant focuses specifically on planning, promotion, and consumer demand for places and spaces for physical activity. The foundation's investments have ranged from local to statewide efforts on projects such as system-wide comprehensive parks and recreation plans, health impact assessments and bicycle and pedestrian plans.

For more information, visit: <http://www.bcbsncfoundation.org/>

## Appendix E: State & Federal Policies

Applicable state and federal policies pertaining to pedestrian programs and facilities are summarized in the table below.

Policy	Applicability to Pedestrian Planning
	<b>Federal Policies</b>
<p><b>Americans with Disabilities Act (ADA) (1990)</b></p>	<p>Ratified in 1990, ADA prohibits discrimination on the basis of disability. Title III pertains to public accommodations including transportation. Federally funded bicycle and pedestrian projects must comply with the ADA.</p>
<p><b>American Association of State Highway &amp; Transportation Officials (AASHTO)</b></p>	<p>AASHTO publishes design standards for transportation facilities including bicycle and pedestrian projects. These standards are often adopted by state departments of transportation, helping in the design of safe and efficient bicycle and pedestrian facilities.</p>
<p><b>Fixing America's Surface Transportation (FAST) Act</b></p>	<p>The FAST Act funds surface transportation programs—including, but not limited to, Federal-aid highways—at over \$305 billion for fiscal years (FY) 2016 through 2020. The FAST Act builds on the changes made by Moving Ahead for Progress in the 21st Century Act (MAP-21.)</p> <p>MAP-21, enacted in 2012, included provisions to make the Federal surface transportation more streamlined, performance-based, and multi-modal, and to address challenges facing the U.S. transportation system, including improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery.</p> <p>The FAST Act creates a priority safety fund to reduce bicycle and pedestrian fatalities by focusing on education of law enforcement; education of motorists, drivers, bicyclists and pedestrians; and implementation of enforcement campaigns.</p>
<p><b>Manual on Uniform Traffic Control Devices (MUTCD) (2009)</b></p>	<p>The MUTCD defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel. The MUTCD is published by the Federal Highway Administration (FHWA) under 23 Code of Federal Regulations (CFR), Part 655, Subpart F.</p>
<p><b>Title VI of the Civil Rights Act of 1964 and Executive Order 12898 (1964, 1998)</b></p>	<p>Title VI of the Civil Rights Act of 1964 requires that each federal agency ensure that no person is excluded, denied, or discriminated based on race, color, national origin, age, sex, disability.</p> <p>Executive Order 12898 signed by President Bill Clinton in 1994 requires that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.</p>
<p><b>United States Department of Transportation Mission Statement (2010)</b></p>	<p>The USDOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including USDOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems.</p>

	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.
	<b>State Policies</b>
<b>NCDOT Bicycle Policy</b>	The NCDOT Bicycle Policy states that bicycling is a “bona fide” highway purpose subject to the same rights and responsibility and eligible for the same considerations as other highway purposes. It also designates bicycle facility planning be included in the state thoroughfare and project planning process.  <a href="http://www.ncdot.gov/bikeped/download/bikeped_laws_Bicycle_Policy.pdf">http://www.ncdot.gov/bikeped/download/bikeped_laws_Bicycle_Policy.pdf</a>
<b>NCDOT Bridge Policy</b>	The NCDOT Bridge Policy states that sidewalks should be included on new bridges with curb and gutter approaches that are not controlled access facilities. Sidewalks may be on one or both sides of the bridge. The sidewalk should be a minimum of 5 to 6 feet wide.  <a href="https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Bridge%20Policy.pdf">https://connect.ncdot.gov/projects/Roadway/RoadwayDesignAdministrativeDocuments/Bridge%20Policy.pdf</a>
<b>NCDOT Complete Streets</b>	Adopted in July 2009, the Complete Streets policy is to accommodate all modes of transportation wherever safe and appropriate; increase connectivity between neighborhoods, streets, and transit systems; and improve safety for pedestrians, cyclists, and motorists.  <a href="http://www.completestreetsnc.org/">http://www.completestreetsnc.org/</a>
<b>NCDOT Division of Bicycle and Pedestrian Transportation</b>	The NCDOT Division of Bicycle and Pedestrian Transportation assists communities across the state improve bicycle and pedestrian safety and mobility. The Division provides technical assistance, funding for research and planning, and resources such as the Watch for Me NC campaign.
<b>NCDOT Greenway Policy</b>	In 1994, NCDOT adopted guidelines to consider greenways and greenway crossings during the highway planning process. This policy was incorporated so that critical corridors which have been adopted by localities for future greenways will not be severed by highway construction.  <a href="http://www.ncdot.gov/templates/download/external.html?pdf=http%3A//www.ncdot.gov/bikeped/download/bikeped_laws_Greenway_Admin_Action.pdf">http://www.ncdot.gov/templates/download/external.html?pdf=http%3A//www.ncdot.gov/bikeped/download/bikeped_laws_Greenway_Admin_Action.pdf</a> AND <a href="http://www.ncdot.gov/bikeped/download/GuidelinesForGreenwayAccommodations.pdf">http://www.ncdot.gov/bikeped/download/GuidelinesForGreenwayAccommodations.pdf</a>
<b>NCDOT Mission Statement</b>	NCDOT’s mission is: “Connecting people and places safely and efficiently, with accountability and environmental sensitivity to enhance the economy, health and wellbeing of North Carolina.” Bicycle and pedestrian facilities help to accomplish this mission by improving safety, encouraging physical activity, and providing environmentally friendly alternatives to motorized transportation.
<b>NCDOT Pedestrian Policy Guidelines</b>	The NCDOT Pedestrian Policy states that the Department of Transportation will replace existing sidewalks disturbed as a result of a highway improvement. The Department is authorized to construct new sidewalks adjacent to State highway improvement projects at the request of the municipality provided the municipality agrees to reimburse for the construction cost of the sidewalks. Maintenance of sidewalks will be the responsibility of the municipality. <a href="http://www.ncdot.gov/bikeped/download/bikeped_Ped_Policy.pdf">http://www.ncdot.gov/bikeped/download/bikeped_Ped_Policy.pdf</a>

<b>Strategic Mobility Formula</b>	The Strategic Transportation Investments (STI) law signed June 2013 establishes the Strategic Mobility Formula for funding transportation projects in North Carolina. The formula divides bicycle and pedestrian projects into incidental and independent projects. Incidental projects are included in larger transportation projects while independent projects are standalone such as adding a sidewalk to an existing road. Independent projects are capped at 20 projects per M/RPO annually.
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Sources: Advocacy Advance, AASHTO, FHWA, NCDOT, USDOT

**Appendix F: Sample Minimum Bicycle Parking Requirements**

Use	Minimum Number of Bicycle Spaces Required
<b>Residential Uses</b>	
Single-family dwelling	None
Townhouse	None
Townhouse, detached	None
Multi-family or apartment	6 spaces or 1 space per 30 dwelling units, whichever is greater
Cluster Box Unit (CBU) Mailboxes	None
Mail Kiosk	None
Congregate Care	None
Assisted Living	None
All other uses	None
<b>Public and Civic Uses</b>	
Ambulatory healthcare facility with emergency department	2 spaces
Assembly hall, nonprofit	4 spaces
Church or place of worship	4 spaces
Day care	2 spaces
Government service	4 spaces
Hospital	4 spaces or spaces for 1% of employees at planned capacity, whichever is greater
School, public or private: Elementary or Junior	1 space for every 40 students above 2 <sup>nd</sup> grade and employees at planned capacity This requirement applies only to schools that have a “No Transport Zone”
School, public or private: Senior	1 space for every 40 students and employees at planned capacity This requirement applies only to schools that have a “No Transport Zone”
Veterinary clinic or hospital	2 spaces
Vocational school	2 spaces
All other uses	2 spaces
<b>Utilities</b>	
All uses	None

<b>Recreational Uses</b>	
Arena, auditorium, or stadium	8 spaces
Park, active or passive	4 spaces or 1 space per 25 motor vehicle spaces, whichever is greater
Use	Minimum Number of Bicycle Spaces Required
Recreation facility, private (single-family dwellings or townhomes)	6 spaces or 1 space per 30 dwelling units, whichever is greater
Recreation facility, private (multi-family or apartment)	6 spaces or 1 space per 30 dwelling units, whichever is greater
Shooting range, indoor	2 spaces
Shooting range, outdoor	2 spaces
All other uses	2 spaces
<b>Commercial Uses</b>	
Adult establishment	2 spaces
Automotive accessory sales and installation	2 spaces
Automotive paint or body shop	2 spaces
Automotive service station	2 spaces
Bars and Nightclubs	2 spaces
Bed and breakfast	2 spaces
Barber and beauty shops	2 spaces
Broadcasting stations (radio and television)	2 spaces
Building supplies, retail	2 spaces
Building supplies, wholesale	2 spaces
Car wash or auto detailing	2 spaces
Commissary	2 spaces
Contractor's offices and storage yards	2 spaces
Convenience store	2 spaces
Convenience store with gas sales	2 spaces
Farmers market	2 spaces
Financial institution	2 spaces
Financial institution, with drive- through service	2 spaces
Funeral home	2 spaces
Game rooms	2 spaces
Gas and fuel, retail	2 spaces
Gas and fuel, wholesale	2 spaces

Greenhouse or nursery, retail	2 spaces
Greenhouse or nursery, wholesale	2 spaces
<b>Use</b>	<b>Minimum Number of Bicycle Spaces Required</b>
Grocery, general	6 spaces or 1 space per 10,000 square feet, whichever is greater
Grocery, specialty	6 spaces or 1 space per 10,000 square feet, whichever is greater
Health/fitness centers and spas	2 spaces
Horse boarding and riding stables	2 spaces
Hotel or motel	2 spaces
Kennel, outdoor	2 spaces
Laundromat	2 spaces
Medical office or dental clinic or offices	2 spaces or 1 space per 20,000 square feet, whichever is greater
Medical or dental laboratory	2 spaces
Monument sales, retail	2 spaces
Office, business or professional	4 spaces or 1 space per 8,000 square feet, whichever is greater
Office: Co-working Space	4 spaces or 1 space per 8,000 square feet, whichever is greater
Office: Call Center	4 spaces or 1 space per 8,000 square feet, whichever is greater
Parking garage, commercial	2 spaces
Parking lot, commercial	2 spaces
Pharmacy	2 spaces
Radio, television and recording studios	2 spaces
Repair and maintenance, general	2 spaces
Repair services, limited	2 spaces
Restaurant, drive-through	2 spaces or 1 space per 50 motor vehicle parking spaces, whichever is greater
Restaurant, general	2 spaces or 1 space per 50 motor vehicle parking spaces, whichever is greater
Research facilities	2 spaces
Retail sales, bulky goods	2 spaces

Retail sales, general	4 spaces or 1 space per 10,000 square feet, whichever is greater
Self-service storage	2 spaces
Studios for arts	2 spaces
Theaters	4 spaces
Towing service	2 spaces
Towing storage	2 spaces
Truck terminals	2 spaces
Vehicle inspection center	2 spaces
Vehicle sales and rental, heavy	2 spaces
Vehicle sales and rental, light	2 spaces
Wholesaling, general	2 spaces
All other uses	2 spaces
<b>Industrial Uses</b>	
All uses	2 spaces

## Appendix G: Policy & Ordinance Recommendations

### Sample Complete Streets Policy

To complement NCDOT's Complete Street Policy, it is recommended that the town implement their own local policy as well. This "Model Comprehensive Plan Language on Complete Streets" by ChangeLab Solutions could be used as a guide for future changes to the town's policies.

Additional information is available here:

<http://changelabsolutions.org/childhood-obesity/complete-streets>.

**Goal 1:** Provide safe and comfortable routes for walking, bicycling, and public transportation to increase use of these modes of transportation, enable convenient and active travel as part of daily activities, reduce pollution, and meet the needs of all users of the streets, including children, families, older adults, and people with disabilities.

**Objective 1.1: Integrate Complete Streets infrastructure and design features into street design and construction to create safe and inviting environments for all users to walk, bicycle, and use public transportation.**

- **1.1.1.** In planning, designing, and constructing Complete Streets:
  - Include infrastructure that promotes a safe means of travel for all users along the right of way, such as sidewalks, shared use paths, bicycle lanes, and paved shoulders.
  - Include infrastructure that facilitates safe crossing of the right of way, such as accessible curb ramps, crosswalks, refuge islands, and pedestrian signals; such infrastructure must meet the needs of people with different types of disabilities and people of different ages.
  - Ensure that sidewalks, crosswalks, public transportation stops and facilities, and other aspects of the transportation right of way are compliant with the

Americans with Disabilities Act and meet the needs of people with different types of disabilities, including mobility impairments, vision impairments, hearing impairments, and others. (i) Ensure that the ADA Transition Plan includes a prioritization method for enhancements and revise if necessary.

- Prioritize incorporation of street design features and techniques that promote safe and comfortable travel by pedestrians, bicyclists, and public transportation riders, such as traffic calming circles, additional traffic calming mechanisms, narrow vehicle lanes, raised medians, dedicated transit lanes, transit priority signalization, transit bulb outs, road diets, (ii) high street connectivity, and physical buffers and separations between vehicular traffic and other users.
- Ensure use of additional features that improve the comfort and safety of users:
  - Provide pedestrian-oriented signs, pedestrian-scale lighting, benches and other street furniture, bicycle parking facilities, and comfortable and attractive public transportation stops and facilities.
  - Encourage street trees, landscaping, and planting strips, including native plants where possible, in order to buffer traffic noise and protect and shade pedestrians and bicyclists.
  - Reduce surface water runoff by reducing the amount of impervious surfaces on the streets.
- **1.1.2.** In all street projects, include infrastructure that improves transportation options for pedestrians, bicyclists, and public transportation riders of all ages and abilities.

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- Ensure that this infrastructure is included in planning, design, approval, construction, operations, and maintenance phases of street projects.
  - Incorporate this infrastructure into all construction, reconstruction, retrofit, maintenance, alteration, and repair of streets, bridges, and other portions of the transportation network.
  - Incorporate multimodal improvements into pavement resurfacing, restriping, and signalization operations where the safety and convenience of users can be improved within the scope of the work.
  - Develop systems to implement and monitor incorporation of such infrastructure into construction and reconstruction of private streets.
  - Allow exclusion of such infrastructure from street projects only upon approval by *[the City Manager or a senior manager of an appropriate agency, such as the Department of Transportation]*, and only where documentation and supporting data indicate one of the following bases for the exemption: (a) use by non-motorized users is prohibited by law; (b) the cost would be excessively disproportionate to the need or probable future use over the long term; (c) there is an absence of current and future need; or (d) inclusion of such infrastructure would be unreasonable or inappropriate in light of the scope of the project.
- **1.1.3.** Develop policies and tools to improve Town of Oak Ridge’s Complete Streets practices:
    - Develop a pedestrian crossings policy to create a transparent decision-making policy, including matters such as where to place crosswalks and when to use enhanced crossing treatments.
    - Develop policies to improve the safety of crossings and travel in the vicinity of schools and parks.
    - Consider developing a transportation demand management/commuter benefits ordinance to encourage residents and employees to walk, bicycle, use public transportation, or carpool.
    - Develop a checklist for Oak Ridge’s development and redevelopment projects, to ensure the inclusion of infrastructure providing for safe travel for all users and enhance project outcomes and community impact.
  - **1.1.4.** Encourage transit-supportive development that provides public transportation in close proximity to employment, housing, schools, retailers, and other services and amenities.
  - **1.1.5.** Change transportation investment criteria to ensure that existing transportation funds are available for Complete Streets infrastructure.
  - **1.1.6.** Identify additional funding streams and implementation strategies to retrofit existing streets to include Complete Streets infrastructure.
- Objective 1.2: Make Complete Streets practices a routine part of Town of Oak Ridge’s everyday operations.**
- **1.2.1.** As necessary, restructure and revise the zoning and subdivision codes, and other plans, laws, procedures, rules, regulations, guidelines, programs, templates, and design manuals, including *[insert all other key documents by name]*, in order to integrate, accommodate, and balance the needs of all users in all street projects on public [and private] streets.

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- **1.2.2.** Develop or revise street standards and design manuals, including cross-section templates and design treatment details, to ensure that standards support and do not impede Complete Streets; coordinate with related policy documents [such as Pedestrian/Bicycle Plans, *insert other relevant documents*].
  - Assess current requirements with regard to road width and turning radii in order to determine the narrowest vehicle lane width and tightest corner radii that safely balance other needs; adjust design guidelines and templates to reflect ideal widths and radii.
  - **1.2.3.** Make training available to planning and public works personnel and consulting firms on the importance of Complete Streets and on implementation and integration of multimodal infrastructure and techniques.
  - **1.2.4.** Encourage coordination among agencies and departments to develop joint prioritization, capital planning and programming, and implementation of street improvement projects and programs.
  - **1.2.5.** Encourage targeted outreach and public participation in community decisions concerning street design and use.
  - **1.2.6.** Establish performance standards with measurable outcomes to assess safety, functionality, and actual use by each category of users; include goals such as:
    - By [2030], facilitate a transportation mode shift so that [20] % of trips occur by bicycling or walking.
    - By [2025], reduce the number of injuries and fatalities to bicyclists and pedestrians by [ ]%.
    - Reduce per capita vehicle miles traveled by [ ]% by [insert year].
    - Provide a high proportion of streets ([ ]%) with sidewalks, low design speeds, tree canopy, and street furnishings.
    - Increase the miles of bicycle lanes and other bikeways by [ ]% by [insert year].
    - Increase the miles of sidewalks by [ ]% by [insert year]
  - **T1.2.7.** Replace automobile level of service as a dominant determinant with multimodal level of service assessment criteria.
  - **T1.2.8.** Collect baseline data and regularly gather follow-up data in order to assess impact of policies.
    - Collect data regarding the safety, functionality, and actual use by each category of users of the neighborhoods and areas within Oak Ridge].
    - Track public transportation ridership numbers.
    - Track performance standards and goals.
    - Track other performance measures such as number of new curb ramps and new street trees or plantings.
    - Require major employers to monitor how employees commute to work.
- Objective 1.3: Plan and develop a comprehensive and convenient bicycle and pedestrian transportation network.**
- **1.3.1.** Develop a long-term plan for a bicycle and pedestrian network that meets the needs of users, including pedestrians, bicyclists, public transportation riders, [*insert other appropriate users if desired*] and people of all ages and abilities, including children, youth, families, older adults, and individuals with disabilities.

- Conduct a demand analysis for each category of user, mapping locations that are already oriented to each mode of travel and type of user and those for which there is latent demand.
- For each category of user, map out a preferred transportation network with routes that will enable safe, interconnected, direct, continuous, and efficient travel from each major origination area to each major destination area.
- Encourage public participation in community decisions concerning the demand analysis, preferred route network, and street design and use to ensure that such decisions: (a) result in streets that meet the needs of all users, and (b) are responsive to needs of individuals and groups that traditionally have not participated in public infrastructure design. Include pedestrians, bicyclists, individuals with disabilities, children and youth, families, older adults, public transportation riders, low-income communities, communities of color, and other distinct social groups, and their advocates. Establish ongoing advisory committees and public feedback mechanisms.
- Identify and prioritize necessary changes in order to implement the preferred network; prioritize neighborhoods with the greatest need and projects that significantly alleviate economic, social, racial, or ethnic inequities.
- Ensure that the networks provide ready access to healthy sources of nutrition.
- Explore the use of non-standard locations and connections for bicycle, pedestrian, and public

transportation facilities, such as easements, restored stream corridors, and railroad rights-of way.

- **1.3.2.** Evaluate timeline and funding of the plan.
  - Assess the degree to which implementation of the plan can be coordinated with planned reconstruction of streets, development projects, utility projects, and other existing funding streams.
  - Develop funding strategies for addressing additional needs; actively pursue funding from state, federal, and other sources.
  - Explore imposing development impact fees and dedication requirements on new development to create paths and other Complete Streets infrastructure.
- **1.3.3.** In collaboration with the Greensboro Area MPO and NCDOT Division 7, integrate bicycle, pedestrian, and public transportation facility planning into regional and local transportation planning programs and agencies to encourage connectivity between jurisdictions.
- **1.3.4.** Develop programs to encourage bicycle use, such as enacting indoor bicycle parking policies to encourage bicycle commuting, or testing innovative bicycle facility design.

**Objective 1.4: Promote bicycle, pedestrian, and public transportation rider safety.**

- **1.4.1.** Identify physical improvements that would make bicycle and pedestrian travel safer along current major bicycling and walking routes and the proposed future network, prioritizing routes to and from schools.
- **1.4.2.** Identify intersections and other locations where collisions have occurred or that present safety challenges for pedestrians,

bicyclists, or other users; consider gathering additional data through methods such as walkability/bikeability audits; analyze data; and develop solutions to safety issues.

- **1.4.3.** Prioritize modifications to the identified locations and identify funding streams and implementation strategies, including which features can be constructed as part of routine street projects.
- **1.4.4.** Collaborate with schools, senior centers, advocacy groups, and public safety departments to provide community education about safe travel for pedestrians, bicyclists, public transportation riders, and others.
- **1.4.5.** Use crime prevention through environmental design strategies (iii) to increase safety for pedestrians, bicyclists, and other users.
- **1.4.6.** As necessary, public safety departments should engage in additional enforcement actions in strategic locations.

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- i. Note that many types of accommodations for people with disabilities are mandated by federal law under the Americans with Disabilities Act.
  - ii. A road diet is a transportation technique in which the number or width of lanes dedicated to motor vehicle traffic is decreased, often by combining the two central lanes into a single two-way turn lane, in order to create additional space within the right of way for features such as bicycle lanes, sidewalks, or buffer zones.
  - iii. Crime prevention through environmental design (CPTED) involves designing the built environment to deter criminal behavior. CPTED aims to create environments that discourage the commission of

crimes by influencing offenders to not commit a contemplated crime, usually due to increased fear of detection.

**Sample CPTED Ordinance Language**

The following sample ordinance can be used whole or part by the town to implement Crime Prevention Through Environmental Design (CPTED) standards within the corridors through the Town Core.

Section 1. That Chapter XX, ARTICLE XX. OVERLAY DISTRICTS, be amended to create and add the following new Section XX-XXX, which shall read as follows:

Sec. XX-XXX. Oak Ridge Town Core Development Overlay District Development Standards

(a) Area Description

The Oak Ridge Town Core Development Overlay District is comprised of a series of commercial nodes characterized by office, retail, and restaurant uses.

(b) Established Boundaries

The “District” consists of all properties adjacent to both sides of NC 68 and NC 150 within the Town Core as defined by the Town of Oak Ridge.

(c) Purpose and Intent

The purpose and intent of the Oak Ridge Town Core Overlay District Development Standards are to guide future development, establish a District character, as well as create an appealing environment, improve the existing condition , provide for the appropriate advertisement of goods and services available within the District, enhance pedestrian connections and increase the public awareness of Oak Ridge as a retail and business district, as well as to continue to protect and preserve the existing residential development in the Oak Ridge area from adverse impacts. The overlay district shall further the principles of Crime Prevention Through Environmental Design (CPTED) through incorporation of the principles of Natural Surveillance, Natural Access Control, and Territorial Reinforcement. All non-single family residential properties shall comply with all Standards provided herein.

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**(d) Compliance**

Every application for new construction, as defined in Chapter XX, shall comply with all applicable overlay district and underlying zoning district standards or those standards outlined in their City Council approved site plans.

Every application for major renovations, as defined in Chapter XX, shall comply with all applicable overlay district and underlying zoning district standards or those standards outlined in their City Council approved site plan. At no time shall the redevelopment of the interior of a building require that the building be moved forward to meet the required setbacks of this District.

All new construction or major renovations must meet both the requirements of this overlay district and the underlying zoning district. These are the minimum requirements, which must be met in order to obtain approval. In the event that there is a conflict between the overlay district and underlying zoning district, the more restrictive regulations shall apply.

Alternative concepts may be considered by the Zoning Coordinator for both new construction and major renovations if consistent with the above mentioned purpose and intent. If denied, any applicant may appeal to the Board of Adjustment, subject to the requirements of Section XX.X-XX, who shall make the final determination as to whether the proposal complies with the standards of this section.

**(e) Review Procedures**

Compliance with all site, building, and sign standards will be determined during the rezoning or commercial site plan and building plan review process, as applicable.

**(f) General Building Standards**

1. Pedestrian amenities shall be provided next to areas used by the public, including, but not limited to shade trees, public open space, water features, sitting areas and mass transit stops.
2. At least thirty (30) percent of the ground level of the principal façade(s) shall be constructed of transparent material.

3. Drive-through window services and queuing lanes shall be placed in the side or rear yard of the parcel on which it is located. Drive through window services and queuing lanes shall be located no closer than fifty (50) feet to residentially zoned properties. Speaker systems shall not be aimed towards residentially zoned properties and the owner of the speaker shall provide evidence that the noise levels created by the speaker system does not exceed levels allowed by the Town. Queuing lanes areas should incorporate natural surveillance techniques.
4. Chain link and wooden fences are prohibited in the District, except during construction. Such construction fencing shall be removed prior to obtaining any certificate of occupancy. Decorative fencing for the purposes of implementing CPTED principles is encouraged.
5. Unpainted or unfinished block fences or walls are prohibited. All sides and elevations of buildings, walls, or block fences visible from public right of way or an adjacent parcel must be architecturally finished (i.e. brick, stucco, or textured concrete masonry units) and maintained.
6. Doors, windows, and other architectural features shall be used to break large wall planes into smaller components. No more than 30% of consecutive front facade that is oriented to and visible at ground level from public rights of way may remain unembellished.
7. All outdoor light fixtures must light all public use areas adjacent to the building (e.g. entryway, courtyards, parking lots, etc.) to a recommended 0.5 to 1.0 foot candle level of illumination. Light fixtures shall be aimed away from residentially zoned properties and shall be of an intensity that does not create a negative impact on the adjacent residential properties.
8. Any exterior garbage receptacles, dumpsters, open storage areas (as defined in Section 27-523) or mechanical equipment must be screened from view from public rights-of-way and residential single family zoned property with 100% opaque material that is compatible with the materials used on the nearest facade of the principal structure. Additionally, garbage receptacles, dumpsters, open storage areas and/or mechanical

equipment must be a minimum 25 feet from any property zoned for residential uses and shall be incorporated into the main structure as a part of new construction or major renovation.

9. Rooftop equipment, excluding vents and stairwell access, shall be screened from view at ground level by use of parapet walls or architecturally compatible screens.
10. Continuous sidewalks shall be provided along the entire length of street frontage, and shall be aligned with and connected to that of adjacent and contiguous properties.
11. For properties with multiple tenants and/or multiple structures on site, pedestrian circulation shall be provided between tenants and/or structures through the use of a sidewalk or other suitable pedestrian connection, not less than five feet wide and where applicable, shall align with and connect to that of adjacent and contiguous properties. Sidewalk paving or other pedestrian connections, where applicable, must continue uninterrupted across the mouth of all curb cuts, subject to Section XX-XXX of the Town of Oak Ridge Code of Ordinances.
12. Retention ponds shall be maintained, landscaped and/or must contain special site features, such as fountains or reflecting pools.
13. The entrance to all service bays for automotive repair and service business must be oriented away from view of any arterial or collector roadway(s) and residentially zoned properties. All automotive repair and service shall take place within the fully enclosed area of the building in which such use is located.
14. All buildings shall have pedestrian access oriented toward the public sidewalk adjacent to the street.
15. Illuminated tubing which outlines a building, fence or other similar structure or part thereof, measuring more than twenty linear feet or enclosing any area greater than twenty square feet is prohibited.
16. The numerical address of each building should be clearly displayed and easily observed from the public right of way.

(g) Parking Standards

1. Vehicle access shall have minimal impact on pedestrian circulation. Sidewalk paving must continue uninterrupted across the mouth of all curb cuts, subject to Section XX-XXX of the Town of Oak Ridge Code of Ordinances. Decorative pavers, other textured material, or similar permanent delineations shall be used across the mouth of all curbcuts to provide a pedestrian conveyance.
2. The façade of parking structures which are within 25 feet of the street right of way must consist of commercial, retail, or office uses on the ground level.
3. Parking structures shall provide landscaping adjacent to those areas which are visible from the street right of way and shall provide and maintain planter boxes in those areas adjacent to residential development. Additionally, such structures over 45 feet in height shall increase the required yard by one (1) foot for each one (1) foot of height.
4. At a minimum 80 percent of all surface parking for commercial properties shall be located in the side or rear yard of the property. All surface parking for other non-single family residential properties shall be located in the rear or side yard of the property. CPTED techniques should be incorporated in the design and security of all parking areas (i.e., visibility, access and security).
5. Vehicular use areas shall not be closer than 25 feet from property zoned for single family uses and shall be screened from said residential uses with a six foot high masonry wall and 15' landscaped buffer.
6. It is recommended that parking facility lighting maintain a light level of 4.0 to 4.0 foot candles.
7. Parking structures should have sufficient security measures and will be reviewed by a certified CPTED Practitioner.

(h) Landscaping, Buffers, and Screening Standards

1. An eight (8) foot landscape buffer shall be provided along the boundary of all vehicular use areas abutting public right of way. Said buffer shall contain one four inch caliper tree per thirty (30) linear feet of vehicular use area abutting a right of way, and a two foot hedge planted twenty-four (24) inches on center. All plants shall meet or exceed the requirements of Chapter 13. Buffer trees may be grouped and larger diameter trees may be substituted on a 2" for 1" basis within an alternative concept and considered on a case by case basis. Trees adjacent to surface parking areas should be trimmed to maintain a six (6) foot clear height, hedges and bushes should be trimmed to maintain a maximum of two (2) feet in height.
2. All portions of each site that are not devoted to building or paving shall be landscaped. No more than thirty (30) percent of the landscaped area may be grassed, the balance shall be landscaped in shrub and ground covers. All Bahia grasses are prohibited.
3. Properties adjacent to residentially zoned properties shall maintain a fifteen foot landscaped buffer and six foot high masonry wall. Said buffer shall consist of at least one tree per 60 linear feet of abutting property.
4. All landscaping must be maintained in good order and all applicants for new construction or major renovation shall provide a schedule of maintenance for the installed landscaping.

(i) General Sign Standards

The following sign standards shall apply to new signs. The following provisions are intended to establish a coordinated graphic program that provides for occupant identification and directional communication, while allowing the creation of unique and informative signs that give a distinct and aesthetically pleasing flavor. These guidelines are not intended to

prohibit unusual signs that may enhance the character of the building, or reflect the nature of the business.

1. Billboards and/or off-site signs are prohibited. Only signs that advertise the business conducted, services rendered, occupant names/symbols, or primary goods sold on the site upon which the sign is erected will be permitted. Signs vested under previous agreements between the Town of Oak Ridge and the sign owner will not be affected by this Overlay District.
2. No sign on a parcel adjacent to or within three hundred (300) feet of a residence shall be illuminated from 11:00 p.m. to 7:00 a.m., except where the premise that the sign advertises is open for business. At no time shall the light from a sign be directed towards a residence.
3. Pylon signs for single occupancy parcels shall be limited to a maximum of fifty (50) square feet in dimension per sign face. Such pylon signs are limited to a maximum height of ten (10) feet, subject to the requirements of Section 27-240.
4. Pylon signs for multiple occupancy parcels which are entitled to one sign shall be limited to a maximum of one hundred (100) square feet in dimension per sign face. Such pylon signs are limited to a maximum height of fifteen (15) feet, subject to the requirements of Section 27-240.
5. If a multiple occupancy parcel is entitled to more than one pylon or ground sign, per Section 27-141, then all allowable pylon or ground signs may be combined into a single pylon or ground sign not to exceed 150 square feet per sign face. Such pylon signs are limited to a maximum height of fifteen (15) feet and ground signs shall be limited to twenty (20) feet.
6. Ground signs for single occupancy parcels shall be limited to a maximum of fifty (50) square feet in dimension per sign face. Such ground signs shall have a

minimum clearance of seven (7) feet at the bottom and a maximum height of fifteen (15) feet.

- 7. Ground signs for multiple occupancy parcels which are entitled to one sign shall be limited to a maximum of one hundred (100) square feet in dimension per sign face. Such pylon signs are limited to a maximum height of seventeen (17) feet, subject to the requirements of Section 27-240.
- 8. The surface area of all shapes, letters, numbers, symbols or illustrations shall not exceed twenty-five (25) percent of the awning or canopy sign surface. Only awnings and canopies constructed of opaque material may be illuminated.
- 9. Wall signs shall not exceed more than one square foot per one linear foot of building frontage facing a public street. No wall sign shall extend more than 12 inches out from the wall to which it is attached nor shall it extend more than 18 inches into the public right of way.
- 10. Multi-family residential dwelling identification signs must comply with Section 27-141 (b), and shall not exceed fifteen (15) feet in height.

(j) Transit Stop Provisions

Wherever possible, development within the Oak Ridge Town Core Overlay District shall be designed to maximize the efficiency of mass transit anticipating future opportunities with regional transit providers.

(k) Curb Cuts/Access Management

Requests for additional curb cuts, for existing development, will only be considered in instances of public safety issues. In cases where such a curb cut is approved, the petitioner shall be solely responsible for any off-site or site specific improvements which are necessary to facilitate the design of the driveway or curbcut, including but not limited to signalization, turn lanes, and accel/decel lanes. These transportation improvements are in no instance creditable against transportation impact fees.

(l) Roadway Landscaping Guidelines

All roadway improvements within the Town Core plus the following roadways which serve as gateways into the Oak Ridge District: NC 68 and NC 150. The design of such landscaping and irrigation should be reviewed and approved by the Town of Oak Ridge.

Section 2. That should a court of competent jurisdiction declare any part of this Ordinance invalid the remaining parts hereof shall not, in any way, be affected by such determination as to the invalid part.

Section 3. That all ordinances or parts of ordinances in conflict herewith are hereby repealed to the extent of any conflict.

Section 4. That this ordinance shall take effect immediately upon becoming a law.