section 4

Transportation

The City of Raleigh recognizes the importance of developing a balanced, efficient, multimodal transportation network that minimizes impacts to the environment and reinforces the livability of neighborhoods. The Transportation Section is meant to guide future development of the city's corridors, roads and highways for motorized and non-motorized transportation including public transit systems, bicycle, and pedestrian networks.

The transportation network is developed in a sustainable pattern that supports the city's future land uses and urban form, minimizes vehicle miles traveled and single-occupancy vehicles, and reduces air pollution and greenhouse gas emissions. Raleigh has a well-established roadway network of streets, arteries, expressways and freeways. While some of these roads are maintained by the NCDOT, the city itself maintains over 1,000 miles of streets, as well as 1,190 miles of sidewalks, nearly 114 miles of bikeable greenway trails and bikeways, and 65 miles of bicycle facilities.

By 2035, Raleigh's roadway network is projected to become more congested, with both the amount of time and number of miles spent on the roads increasing. Vehicle miles traveled (VMT) and vehicle hours traveled (VHT) are both projected to increase from 2005 levels by over 50 percent – travel along freeways and other major streets will be most affected. In addition, the total number of trips (a.m., p.m., and overall) taken on Raleigh's road network is projected to increase by over 50 percent.

Capital Boulevard (north of I-540), I-540 (from Capital Boulevard to I-40), and U.S. 401 (north of I-540) in north Raleigh are three roadways where both the traffic and level of service are projected to worsen greatly from 2005 to 2035. To affect these projections, not only will existing facilities and services have to be improved, but new mobility options – including increased and higher capacity transit service – must be created to meet the growing needs of Raleigh through the year 2040.

The Transportation Section contains policies that will create a well-connected, multimodal transportation network, support increased densities, help walking become more practical for short trips, support bicycling for both short- and long-distance trips, improve transit to serve frequented destinations, conserve energy resources, reduce greenhouse gas emissions and air pollution, and do so while maintaining vehicular access and circulation. More specifically, the policies and actions within this element address the following key transportation issues:

- *Sprawling and segregated land use patterns have led to a high dependency on single-occupancy automobile trips.*

- *There is a need for better coordination of land use and transportation project review procedures to enable efficient and connected development patterns.*

- *Road widening and new facilities to address automobile congestion are not by themselves feasible solutions to the region's mounting congestion and long commutes (See Policy T 3.3: Redefining LOS).*

- *Even with programmed investments, the future transportation system is projected to be severely constrained by the year 2035.*

- *The enormous growth experienced and planned in Raleigh will transform the city into the center of the region, and has the potential of changing the dynamics of the region's transportation system.*

- *Traffic calming will continue to be an issue for many neighborhoods as traffic levels increase on major streets and drivers seek alternative routes using local residential streets.*

- *There are limited multimodal facilities that provide transit, bicycle and pedestrian accessibility, and help reduce congestion.*

- *Better coordination is needed among transportation planning partners such as: NCDOT, CAMPO, GoTriangle, GoRaleigh, and the surrounding counties and cities.*

- *Safety issues must be addressed along corridors, at intersections, and at locations with bicycles and pedestrians.*

- *Limited efficiency and coverage area of the current transit system prevents it from being an attractive alternative to the automobile.*

Achieving a balanced and effective transportation system will require a greater investment in transit, pedestrian, and bicycle infrastructure. Detailed information concerning the underlying issues and background information can be found in the *Community Inventory Report.* For Raleigh to meet the vision theme of *Economic Prosperity and Equity*, the transportation system must be multimodal, operate efficiently, and provide all users with the ability to reach their destinations safely. Raleigh needs to provide facilities and services that meet the needs of the city's residents and visitors, including senior citizens, the disabled, low-income, and transit-dependent persons.

Not only does the transportation system provide for the mobility of people and goods, but over the long term it influences patterns of growth and the level of economic activity through the accessibility it provides to adjacent land uses. To meet the vision theme of *Coordinating Land Use and Transportation*, the Comprehensive Plan must provide policies to help reduce the need for trip-making (particularly single-occupant vehicle, or SOV, trips), provide choices for shorter trips, and encourage walking, bicycling, and transit use. The Transportation and Land Use Sections must mutually reinforce one another and provide Raleigh with a foundation to make informed decisions.
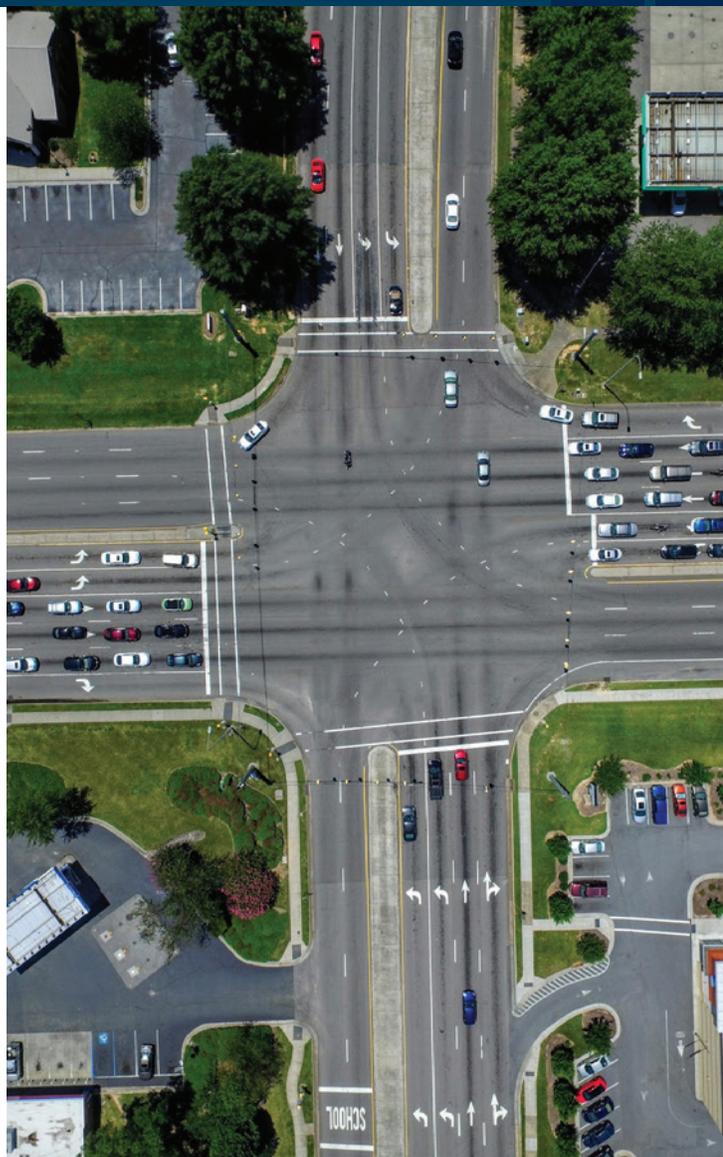
When considering the relationship of transportation with vision themes such as *Growing Successful Neighborhoods and Communities* and *Greenprint Raleigh*, it is important to consider social and environmental impacts. Reducing auto trips and auto dependency can make significant improvements to air quality. By using Context Sensitive Solutions (CSS), transportation investments can be developed that meet the needs of citizens and the surrounding land uses.

Another vision theme addressed in the Transportation Section is *Managing Our Growth*. By 2035, Raleigh's roadway network will be extremely congested. It will not be possible to widen many congested roads due to limited funding and right-of-way. The problem can be attributed to extensive low density growth patterns, where 35 percent of commuters have a commuting travel time greater than 30 minutes, and per capita vehicle miles greatly exceed national norms for metro areas. Additionally, nearly 94 percent of Raleigh's population relies on highway-based trips, concentrating traffic pressure on highway corridors.

In order for Raleigh's transportation network to remain sustainable and continue to operate effectively, it will be important to manage the assets already in place and determine the most fiscally responsible transportation investments. This will also take considerable coordination between planning partners such as: North Carolina Department of Transportation (NCDOT), Capital Area Metropolitan Planning Organization (CAMPO), GoTriangle, GoRaleigh, and the surrounding counties and cities.

To track the efficiency of the city's policies, any of the Comprehensive Plan's vision themes that may be relevant to a particular policy are indicated by one of six icons. The vision themes are:

- Economic Prosperity and Equity
- Expanding Housing Choices
- Managing Our Growth
- Coordinating Land Use and Transportation
- Greenprint Raleigh
- Growing Successful Neighborhoods and Communities

In this Section and throughout the Plan, Key Policies used to evaluate zoning consistency are noted as such with an orange dot (●).

4.1 Land Use and Transportation Coordination

Like many growing cities, Raleigh is experiencing extensive low density suburban growth that has had a negative impact on the overall transportation system. Projects exclusively designed to address automobile congestion are not feasible solutions to the city's mounting congestion and long commutes. Roadway investments must be balanced with investments in other transportation modes such as public transportation and greenways. In addition, it is important to link development to sidewalks and greenways, as well as provide adequate connections to transit. Wake Transit, the plan for improved and increased bus service for the city and county, lays out a network of frequent and bus rapid transit routes that will improve mobility and help direct land use policy.

Land use patterns have a significant effect on trip generation and travel behavior. Compact, mixed-use and walkable developments mitigate traffic generation and impacts to the street system by shortening trip distances, capturing a greater share of trips internally, and facilitating transit and non-motorized trip-making. Successful mixed-use areas with multimodal access can thrive with lower parking ratios, freeing up land and capital for open space amenities and productive, revenue-producing uses.

Policies in this section are used to develop and maintain a sustainable multimodal transportation system that supports new and existing residential, commercial and recreational areas, preserves and enhances neighborhood livability and the quality of life for Raleigh's residents, and provides for the safe and efficient movement of people and goods. Land use and transportation decisions should mutually reinforce each other.

See also '3.4 Land Use and Transportation Coordination' in Section 3: 'Land Use' for additional policies related to improving land use and transportation coordination.

Policy T 1.1 Coordination with Land Use Map

Transportation planning, development, expansion, and investment in transportation facilities should be coordinated with the Future Land Use Map.

See Section 3. 'Land Use.'

Policy T 1.2 Right-of-way Reservation

Support the early identification and acquisition of land for future transportation corridors through land use planning and development permitting.

Policy T 1.3 Multimodal Transportation Design

Offer residents safe and attractive choices among modes including pedestrian walkways, bikeways, public transportation, roadways, railways, and aviation. The street patterns of newly developed areas should provide multimodal transportation alternatives for access to and circulation between adjacent neighborhoods, parks, shopping centers, and employment areas.

Policy T 1.4 Increasing Mobility Choice

Diversify the mobility choices for work trips by targeting transit investments along corridors that connect concentrations of office, retail, and residential uses.

Policy T 1.5 Context-sensitive Road Design

"Context Sensitive" approaches shall be used for new roadways or widening of existing roads to minimize impacts to historic business districts and neighborhoods and sensitive natural areas (particularly in watershed protection, conservation management and metro park protection areas).

See Text Box: Sensitive Area Streets.

Policy T 1.6 Transportation Impacts

Identify and address transportation impacts before a development is implemented.

Sensitive Area Streets

Sensitive area streets are generally designed with a shoulder and swale section. They are typically utilized within a Metro Park or Watershed Protection Overlay District, or in other areas approved by the City Council. Special design standards for these streets are contained within the Raleigh Street Design Manual.

Action T 1.1 Completed 2016

Action T 1.2 Completed 2014

Action T 1.3 Completed 2016

Thresholds for Transportation Impact Analysis

NCDOT has adopted guidelines for when and how a Transportation Impact Analysis (TIA) should be performed. Many local jurisdictions, including Wake County, have also adopted TIA thresholds, typically lower than those chosen by NCDOT. NCDOT recommends a TIA when one of the following conditions is met:

- *Access is from a four-lane street or greater.*

- *Daily trips exceed 3,000 vehicles per day (VPD).*

- *Within 1,000 feet of an interchange.*

- *Affects a location with a high crash history.*

- *Involves existing or proposed median crossover.*

- *Involves an active roadway construction project.*

- *Involves an active TIP project.*

Some example thresholds from local jurisdictions include:

- *City of Durham: peak hour trips ≥ 150 Vehicles per hour (VPH).*

- *Wake County: peak hour trips ≥ 100 VPH or daily trips ≥ 1,000 VPD.*

- *Town of Cary: peak hour trips ≥ 20 VPH and any development where expected trips exceed traffic generated by R-20 development (2.2 units per acre).*

- *City of Charlotte: daily trips ≥ 2,500 VPD; or affects a location with a high crash history; or takes place at a high congestion location (vehicles/capacity > 1); or creates a fourth leg at an existing signalized intersection; or exacerbates an already difficult situation (railroad crossing, school access, etc.).*

4.2 Roadway System and Transportation Demand Management

Raleigh is currently served by a mixture of streets striking different balances between the two major functions: providing mobility for through traffic, and providing access to adjacent land uses. Historically, Raleigh's roadway system was planned according to the common functional classification scheme of arterials, thoroughfares and collectors. This approach, while useful for determining road function and width, did not provide for much variation in street design based on land use context, nor did it identify how to implement a "complete streets" approach to integrating other modes (pedestrians, cyclists, and transit riders) within the right-of-way.

With the adoption of a new development code in 2013, Raleigh has implemented an entirely new street classification system that is reflected in three locations: the policy basis for the street system is described in this section of the Comprehensive Plan; the regulatory requirements are set forth in the Unified Development Ordinance; and the engineering standards are detailed in the Raleigh Street Design Manual. The new street classification system addresses contexts ranging from high volume avenues to low-speed neighborhood streets and mixed-use main streets. It also sets forth requirements for bicycle and pedestrian facilities within streets. The function and purpose of each of the street types illustrated on **Map T.1** are described on the right.

Street System

Map T.1 reflects the adopted Street Plan for the urbanized area, approved by the City Council and set forth in the Unified Development Ordinance. The adopted Street Plan is a component of the regional Comprehensive Transportation Plan, which is mutually approved by the governing bodies of all local jurisdictions in the region through the Capital Area Metropolitan Planning Organization (CAMPO) and the North Carolina Department of Transportation (NCDOT).

The street system is classified into six major categories:

- **Sensitive Area Streets** *for locations such as watersheds or other environmentally sensitive lands where storm sewer infrastructure is not available or recommended.*

- **Local Streets** *provide access to primarily residential areas.*

- **Mixed Use Streets** *provide access to areas with ground floor commercial uses and generally feature on-street parking.*

- **Major Streets** *are facilities of four or more lanes that primarily serve mobility functions while providing varying levels of access to adjacent land uses.*

- **Industrial and Service Streets** *serve low volumes and provide access to industrial and commercial areas where demand for pedestrian and bicycle amenities is low.*

- **Limited Access Highways** *are major transportation facilities serving heavy volumes of traffic, often of a regional nature. These facilities are designed to handle the heavy peak hour demands of commuting, or to serve concentrated destinations such as sports and entertainment facilities.*

A more detailed description of these categories and the specific street types found in each follows.

Sensitive Area Streets

Portions of the city adjacent to environmentally-sensitive areas require streets to be designed in a manner that reflect this context and the need for a higher degree of environmental and/or aesthetic control. The city has utilized sensitive area street designs for some time within designated watershed areas and adjacent to Umstead State Park. Streets in these areas have historically employed narrower impervious surface footprints and utilized open channel shoulder and ditch cross-sections. Newer facility designs for this class of streets have included pedestrian or greenway infrastructure located behind the ditchline. The following roadway cross-sections are intended for use in these "Sensitive" areas.

- **Sensitive Area Parkways** *are four-lane streets intended to support regional travel. Medians are a standard feature of parkways in almost every case, except where a narrower cross-section is needed to minimize right-of-way and environmental impact.*

- **Sensitive Area Avenues** *are two-lane streets for use in low-intensity areas. They have relatively narrow paved widths, which includes paved shoulders for bicycle and pedestrian uses in retrofit situations lacking sidewalks.*

- **Sensitive Area Residential Streets** *are appropriate in rural conditions with large lot homes, typically without water and sewer provisions.*

Local Streets

The local street system provides direct access to individual property throughout the city and makes up the majority of the city's street inventory. Design of these streets can provide substantial flexibility relative to the adjacent land use context and an area's multimodal transportation needs. However the street design must not be taken for granted, as poorly designed local streets can lead to unsafe driving conditions, negative aesthetics, and poor bicycle and pedestrian access for the community.

Local Streets should place a high priority on pedestrian accessibility, and they should also be considered as low speed bicycle and vehicle routes. Local streets should be relatively short in total distance and used less frequently compared to other street typologies. Sidewalks on both sides of the street should be provided in all cases. Travel lanes should not be striped, consistent with the flexible shared-use nature of these streets.

- **Neighborhood Local** *streets come in three varieties that vary in the width allocated to travel and parking lanes. At their narrowest, opposing cars may need to yield to one another in order to pass. Street widths should be chosen based on anticipated traffic demand and consistent with the Raleigh Street Design Manual.*

- **Multifamily Streets** *are a special street type for use in townhouse and apartment/condominium communities where much of the parking demand is accommodated in continuous parking areas adjacent to the public right-of-way. These streets look like a street with parallel, diagonal or perpendicular on-street street parking, but with an arrangement by which the parking is outside of the public right of way.*

Table T-1 Summary of General Street Capacity

Street Type	Typical Two-Way Volumes	Typical Section	Examples
Freeway	> 40,000 Vehicles per Day (VPD)	At least two or three lanes in each direction, with medians no direct driveway access	I-40, I-440, US 64 Bypass
Eight-lane Street	40,000-60,000 VPD	Four lanes in each direction with medians and limitations on driveway access	Portions of Glenwood Avenue, Capital Boulevard, South Saunders Street
Six-lane Street	25,000 – 45,000 VPD	Three lanes in each direction, with medians or a center turn lane and limitations on driveway access	US 401 (Louisburg Road.), NC 50 (Creedmoor Road), Wake Forest Road, Falls of Neuse Road, Hammond Road
Four-lane Street	15,000 – 35,000 VPD	Two lanes in each direction, with medians or a center turn lane and varying limitations on driveway access	Millbrook Road, Lynn Road, Hillsborough Street, Blue Ridge Road, Leesville Road, Martin Luther King Jr. Boulevard, Brier Creek Parkway
Three-lane Street	8,000 – 20,000 VPD	At least one lane in each direction, with medians or a center turn lane	Clark Avenue, Ray Road, Newton Road, Lassiter Mill Road, Peace Street
Two-lane Street	<10,000 VPD	One lane in each direction with various configurations for on-street parking	Various

Mixed Use Streets

Mixed-use streets come in two basic types: Avenues, which are intended for areas of more suburban development, and Main Streets, which are appropriate for urban mixed-use settings where buildings front on the sidewalk.

- **Mixed-Use Avenues** *are two- or three-lane facilities that provide access to abutting commercial and mixed land uses as well as higher density residences. They serve as primary bicycle and pedestrian routes with bicycle lanes and sidewalks, and may also accommodate local transit vehicles. Avenues may feature a median or center turn lane, and may provide on-street parking.*

- **Main Streets** *are intended for denser, more urban areas with lower vehicular speeds. Unlike Avenues, bike lanes are not provided, as cyclists are intended to use the full travel lane. Wider sidewalks and the option of diagonal on-street parking are also provided.*

Major Streets

The Major Street category includes Avenues of four or more lanes, and also introduces a new street type, the Multi-Way Boulevard.

- **Avenues** *functioning as Major Streets have a similar purpose to two- and three-lane Avenues but apply to thoroughfare and arterial streets that require four or more lanes to accommodate traffic demand. Avenues with four or more lanes always feature medians. Signalized intersections are spaced further apart on major streets to better facilitate vehicular mobility. Major transit routes are often found on these corridors. Mid-block pedestrian crossings shall be installed on long blocks to maintain walkability in areas where pedestrian usage could be heavy and to provide easy access to transit facilities. On-street parking on facilities of six or more lanes is not recommended; such streets should be designed as Boulevards.*

- **Boulevards** *represent a unique street cross-section that are intended to provide a high level of both access and mobility — accommodating a significant volume of through traffic, while also providing a high level of access to urban land uses with welcoming pedestrian amenities. Multi-Way Boulevards solve this conflict by using medians to separate through travel lanes from lanes used for parking access and bicycle circulation. Pedestrian accessibility is typically provided directly adjacent to the land uses and separated from the through travel lanes.*

Industrial and Service Streets

Streets within industrial and service areas typically carry lower traffic volumes but accommodate a higher proportion of truck traffic. Pedestrian facilities do not need to be as generous as in mixed-use areas, and separate bicycle facilities are not provided. On-street parking may be provided along these streets, however parking may be restricted in cases where industrial access points require additional space to accommodate larger vehicles.

T-1: **Street Plan**

Downtown

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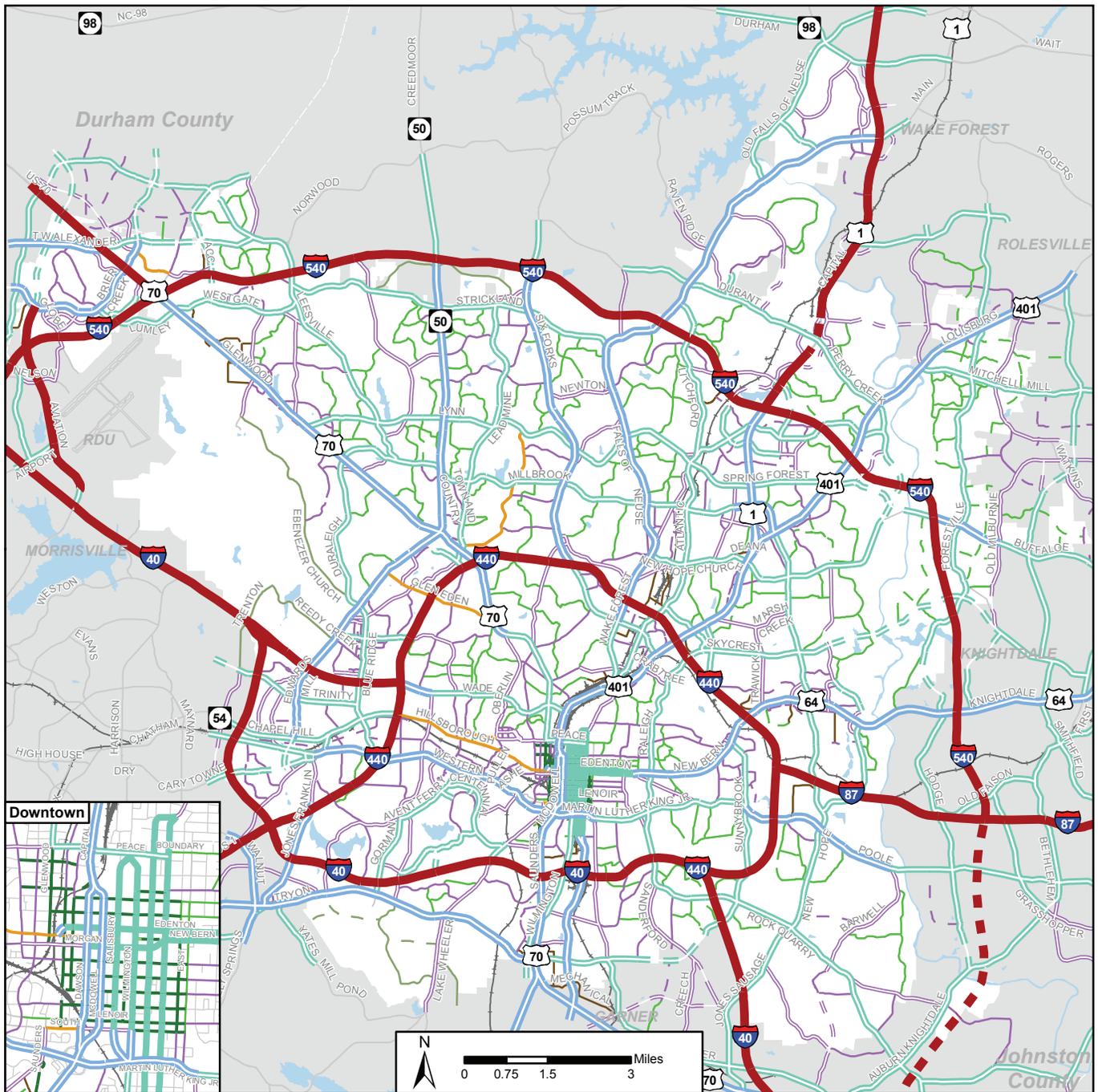
Sensitive Area Streets
- ▬ Sensitive Area Parkway
- ▬ ▬ Sensitive Area Parkway Proposed
- — Sensitive Area Avenue
- – – Sensitive Area Avenue Proposed

Local Streets
- — Local Street
- – – Local Street Proposed

Mixed Use Streets
- — Avenue 2-Lane, Undivided
- – – Avenue 2-Lane, Undivided Proposed

- — Avenue 2-Lane, Divided
- = = Avenue 2-Lane, Divided Proposed
- — Avenue 3-Lane, Parallel Parking
- – – Avenue 3-Lane, Parallel Parking Proposed
- — Main Street
- – – Main Street Proposed

Major Streets
- ▬ Avenue 4-Lane, Parallel Parking
- ▬ ▬ Avenue 4-Lane, Parallel Parking Proposed
- — Avenue 4-Lane, Divided
- = = Avenue 4-Lane, Divided Proposed

- — Avenue 6-Lane, Divided
- = = Avenue 6-Lane, Divided Proposed
- ▬ Multi-Way Boulevard
- ▬ ▬ Multi-Way Boulevard Proposed

Industrial and Service Streets
- — Industrial Street
- – – Industrial Street Proposed

Other Streets
- ▬ Limited Access Highway
- ▬ ▬ Limited Access Highway Proposed

Map created 3/13/2018 by the
Raleigh Department of City Planning

Limited Access Highways

Limited Access Highways include both limited-access Freeways and Expressways. Freeways are multi-lane, median-divided highways designed to the highest possible standard. Freeways are characterized by complete control of access and are subject to regulation by NCDOT and the Federal Highway Administration (FHWA). These facilities are designed to carry heavy amounts of traffic at higher rates of speed and do not typically include any multimodal infrastructure within the corridor. Access is provided through grade-separated interchanges and no perpendicular access via at-grade intersections or driveways is allowed. Examples of this type of roadway are interstates 40 and 440.

Expressways are multi-lane, median-divided highways with lower design standards than Freeways and a high degree of access restriction, however at-grade intersections, traffic signals, and direct driveway access may be utilized. Multimodal infrastructure within these corridors is usually provided via separated, parallel facilities. Capital Boulevard between Wade Avenue and Wake Forest Road is an example of an Expressway.

Special Study Areas

During the comprehensive planning process, five specific areas of Raleigh were identified for focused transportation studies to either determine preferred roadway alignments, locate potential new connections, or identify other roadway projects needed to address specific transportation and land use issues or problems. The Crabtree Valley Study was completed and presented to City Council in 2011. The Gorman Street extension will be evaluated as part of a larger regional effort. The Southern Gateway Corridor Study addressed the need for planning in the Centennial Parkway, Lake Wheeler Road, and Maywood Avenue area.

Two areas forecasted to suffer from significant congestion based on 2040 growth projections remain from the list identified for special study in 2009 and two additional areas were identified as part of the five-year update planning process. The four areas and the study purpose are described below:

1. **Six Forks/Wake Forest Road Corridor:** *Evaluate the growth projections for this area from I-440 to Wake Forest Road. Future volume projections indicate roadways in this area may be significantly over capacity in the future.*

2. **Atlantic Avenue Corridor:** *Evaluate the growth projections for the corridor between Capital Boulevard and Millbrook Road. Future volume projections indicate Atlantic Avenue may be over capacity in the future and may warrant reclassification.*

3. **Wade Avenue:** *Current configuration of Wade Avenue is substandard design. Evaluate ways to address substandard design to reduce congestion and improve safety.*

4. **Wake Forest Road/Falls of Neuse:** *Current configuration of Wake Forest Road/Falls of Neuse between St. Albans Drive and Strickland Road is substandard design. Evaluate ways to address substandard design to reduce congestion and improve safety.*

Policy T 2.1 Integration of Travel Modes

Promote and develop an integrated, multimodal transportation system that offers safe and attractive choices among modes including pedestrian walkways, bikeways, ride sharing, public transportation, roadways, railways, and aviation.

Policy T 2.2 Defining Future Rights-of-way

As resources permit, move from "conceptual" routes for future streets to more specifically mapped future rights-of-way, backed by engineering studies. Mapping streets also determines where to install water and sewer infrastructure and reduces the need for easements across private property.

Policy T 2.3 Eliminating Gaps

Eliminate "gaps" in the roadway system and provide a higher roadway grid density that will increase mobility options and promote the accessibility of nearby land uses.

Policy T 2.4 Road Connectivity

The use of cul-de-sacs and dead-end streets should be minimized.

Policy T 2.5 Multimodal Grids

All new residential, commercial, or mixed-use developments that construct or extend roadways should include a multimodal network (including non-motorized modes) that provides for a well-connected, walkable community, preferably as a grid or modified grid.

Policy T 2.6 Preserving the Grid

Existing street grid networks should be preserved and extended where feasible and appropriate to increase overall connectivity.

Policy T 2.7 Conditions for Roadway Closure

No street, alley, or other public right-of-way shall be abandoned without the highest level of scrutiny and concurrence among affected city departments and utility companies. Right-of-way abandonment shall be subject to the following findings:

• *The closure will not compromise the integrity of the city's street network, nor lead to a significant loss of vehicular, bicycle, or pedestrian connectivity.*

• *The closure will not impair the ability to provide utility service.*

• *The closure will not adversely impact the health, safety and welfare of the community, including access by emergency vehicles.*

• *The proposed closure is not in conflict with adopted Raleigh Historic Development Commission policy regarding street, alley, or other public right-of-way closures in local historic and National Register districts.*

• *The proposed closure is in the public interest.*

Policy T 2.8 Access Management Strategies

Appropriate access management strategies (i.e. location and spacing of permitted driveways) should be applied based on a roadway's functional characteristics, surrounding land uses, and the roadway's users.

Policy T 2.9 Curb Cuts

The development of curb cuts along public streets—particularly on major streets—should be minimized to reduce vehicular conflicts, increase pedestrian safety, and improve roadway capacity.

Policy T 2.10 Level of Service

Maintain level of service (LOS) "E" or better on all roadways and for overall intersection operation at all times, including peak travel times, unless maintaining this LOS would be infeasible and/or conflict with the achievement of other goals.

Level of Service (LOS)

LOS A - Drivers perceive little or no delay and easily progress along a corridor.

LOS B - Drivers experience some delay but generally driving conditions are favorable.

LOS C - Travel speeds are slightly lower than the posted speed with noticeable delay in intersection areas.

LOS D - Travel speeds are well below the posted speed with few opportunities to pass and considerable intersection delay.

LOS E - The facility is operating at capacity and there are virtually no useable gaps in the traffic. This is typically the acceptable threshold for urban areas.

LOS F - More traffic desires to use a particular facility than it is designed to handle resulting in extreme delays.

Source: Highway Capacity Manual 2000 (HCM)

Policy T 2.11 Lane Additions

Consider adding lanes to increase roadway capacity only after the roadway exceeds 20 percent of full capacity and all other alternative approaches have been considered. This includes enhancing other transportation modes and roadway modifications such as restricting driveway access and adding turn lanes. Improvements to the roadway network should increase vehicle dispersion and circulation.

Policy T 2.12 Interjurisdictional Transportation Planning

Continue to work with regional planning partners and local transportation agencies to coordinate transportation planning, operations, and funding priorities and to identify existing and future transportation corridors that should be linked across jurisdictional boundaries so that sufficient right-of-way may be preserved.

Policy T 2.13 Increasing Vehicle Occupancy

Encourage and support programs that increase vehicle occupancy, including the provision of traveler information, shuttles, preferential parking for carpools/vanpools, park and ride, transit pass subsidies, and other methods (refer to Triangle Region Long Range Transportation Demand Management Plan).

Policy T 2.14 Employer-based Trip Reduction

Encourage employers to provide transit and bikeshare subsidies, bicycle facilities, alternative work schedules, ridesharing, telecommuting and work-at-home programs, employee education, and preferential parking for carpools/vanpools.

Policy T 2.15 Sensitive Road Design

Ensure that all new roadway projects and major reconstruction projects preserve existing trees and topography to the maximum extent feasible and provide an adequate street tree canopy while providing for the safest facility possible. Involve relevant experts (such as a certified arborist) in project planning when implementing this policy.

Policy T 2.16 Assessing Changes in Road Design

Subject all proposed changes to the treatment of existing vehicular rights-of-way, such as changes to the number and type of travel lanes, to a study prior to implementation to determine the impacts on the larger network and the level of service of all relevant modes.

Policy T 2.17 Bridge Improvements

Coordinate with NCDOT for bridge monitoring, maintenance, and rehabilitation. Bridge improvements should be considered when roadway investments are being pursued.

Policy T 2.18 Roadway Tree Canopies

Provide additional tree canopies consistent with recommendations from the Urban Forestry Division. Along multi-lane roads with planted medians, this reduces the visual height-to-width ratio of the overall streetscape and provides pedestrian refuges at signalized crossings.

Action T 2.1 Completed 2015

Action T 2.2 Completed 2016

Action T 2.3 Right-of-way Reservation

Conduct detailed analyses of proposed corridors and roadway connections to establish alignments, and take proactive steps to resolve future corridors and connections via development coordination or by acquisition.

Action T 2.4 Limited Access Lane Management

Coordinate with NCDOT on limited access facilities to investigate the feasibility of establishing lane management policies such as high occupancy vehicle (HOV) lanes, truck lanes, express lanes, and toll lanes.

Action T 2.5 Intermodal Facility Prioritization

Work with CAMPO in the prioritization of inter-modal transportation facilities to ensure that adequate funding consideration for the planning and programming of these facilities is being given as part of CAMPO's Transportation Improvement Program (TIP).

Action T 2.6 Completed 2015

Action T 2.7 Special Transportation Studies

Undertake special studies for the areas identified in the introduction to this section:

• *Six Forks/Wake Forest Road Corridor south of I-440.*
• *Atlantic Avenue Corridor.*
• *Wade Avenue.*
• *Wake Forest Road/Falls of Neuse.*

Action T 2.8 Transportation Funding Strategy

Develop a funding strategy for all maintenance and new construction transportation projects, including public/private partnerships for construction of strategic transportation facilities. The strategy should reflect a multimodal approach to transportation issues.

Action T 2.9 Completed 2014

4.3 Complete Streets: Hierarchy and Design

Transportation corridors should be more than just roadways for automobiles. Corridors can be designed and classified to reflect a balance between various modes and surrounding land uses. The term "Complete Streets" refers to streets that are designed to enable safe access and mobility for all users (i.e., pedestrians, bicyclists, motorists, and transit riders) of all ages and abilities. The urban form, trees, and buffers along such streets should also relate to the modes of transportation they support and the land uses they serve. Complete streets further social justice by accommodating users of different means and abilities, and enhance real estate value by improving the public realm.

While the CAMPO Comprehensive Transportation Plan classifies roadways based on vehicle capacity and function, the Raleigh Street Plan provides guidance on how streets should relate to the land uses they serve, and the role of pedestrian and bicycle circulation and transit. Raleigh has transitioned to a new typology that includes the dimensions of street character and land use in addition to capacity and function, and broadens the notion of capacity to encompass the movement of people, not just cars. The new classifications include typologies such as Avenues, Boulevards, Parkways, and Main Streets.

NCDOT is considering similar transitions to its street classification system as part of its implementation of its Complete Streets Policy. The Street Map, displayed in Map T-1, further applies a new system of street overlays as part of the Growth Framework Map (*see Map F-1 in Section 2: 'Framework'*). There are four types of corridors identified on the Map: highway, multimodal, urban, and parkway. These types have been applied to all existing and proposed major streets within the city.

- **Highways:** *These are limited-access, grade separated roadways providing little to no direct access to adjacent land uses. NCDOT maintains jurisdiction over these facilities and no changes are proposed to how these are planned and developed.*

- **Multimodal Streets:** *Transit and non-motorized modes are anticipated to provide a significant share of the total capacity of these streets, and the street right-of-way should be managed accordingly. Where bus is the transit mode, these streets should be targeted for improvements such as turn-out lanes, shelters and benches at every stop. Queue jump lanes, signal priorities, and exclusive lanes for transit may also be appropriate. Some transit streets may eventually convert to streetcar service, and for all such streets, a high level of pedestrian facilities and amenities should be provided. Land uses are expected to directly connect to and address the street. Bicycles should be accommodated. Alternative cross-sections may be employed to meet these goals.*

- **Urban Streets:** *These are like multimodal streets but are not anticipated to have the same level of transit service. Urban streets can be narrower than other streets in the same classification, and should include on-street parking (where appropriate) and enhanced pedestrian facilities.*

- **Parkways:** *These streets are suburban in nature and more likely to be framed by landscaping rather than buildings. More traditional cross-sections can be employed on these streets. Landscaped medians are encouraged.*

Implementing a Complete Streets Network

The City of Raleigh is dedicated to improving the lives, health, and well-being of our residents and visitors, regardless of age, income, health, or mode of transport. A network of Complete Streets across the city contributes to both livability and sustainability in that it provides safe and equitable mobility choices, recognizes all users regardless of physical ability or mode of travel, provides amenities and infrastructure for all modes, and complements adjoining architectural, economic, community, and land use patterns. With a Complete Streets Policy, the city recognizes that all streets are different and that the needs of various users must be balanced. Such a network will be accessible to users of all ages and ability—including bicyclists, pedestrians, transit users, motorists, freight providers, and municipal and emergency service providers—and ensure that all users experience a functional and visually attractive environment.

In developing a Complete Streets network, transportation improvements may include a wide variety of facilities and amenities, as appropriate, to meet the needs of all users. These may include but are not limited to:
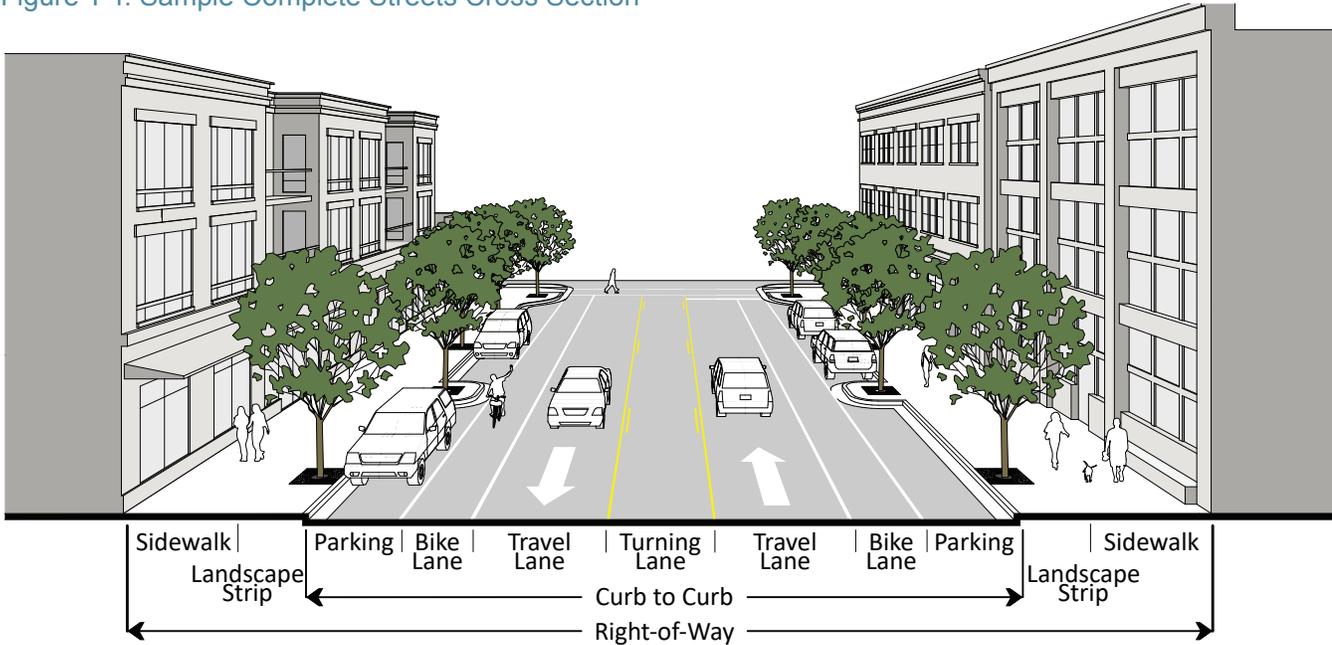
- *Sidewalks and pedestrian safety improvements, such as traffic signals, roundabouts, bulb-outs,curb extensions, high visibility crossings, buffer zones, and shared use pathways.*

- *Bicycle safety improvements, such as conventional bike lanes, bike parking, separated bike lanes, wide outside lanes, sharrows, paved shoulders, and signal detection.*

- *ADA compliance and full accessibility.*

- *Transit infrastructure including bus shelters, benches, trash cans, and pads.*

- *Street- and pedestrian-level lighting\.*

- *Street trees, landscaping, street furniture, and adequate stormwater/drainage facilities.*

- *Access for emergency services without compromising safety or accessibility.*

- *Infrastructure for freight providers, including designated routes, large turning radii, and loading zones.*

Complete street designs should be context-sensitive, consider local needs, and incorporate up-to-date design standards appropriate for the project setting. Each project must be considered both individually and as part of a connected network. Design should consider such elements as natural features, adjacent land uses, input from local stakeholders and merchants, community values, and future development patterns as outlined in the city's Future Land Use Map, located in Section 3. Land Use, Comprehensive Plan, and adopted studies. When determining the community context and the feasibility of implementing Complete Streets concepts, there should be a balance between the safety of all users, the roadway's vehicular level-of-service, and the multimodal quality-of-service.

The city's Complete Streets Policy applies to all street projects, including those involving new construction, reconstruction, retrofits, repaving, rehabilitation, or changes in pavement marking. The city will actively look for opportunities to repurpose rights-of-way to enhance connectivity for all travelers. The development of a Complete Streets network will be achieved incrementally through single projects, as well as through continuing minor improvements, maintenance, and operational activities. The city will need to work closely with local, regional, and federal transportation agencies to promote compliance, as well as collaborate with all users of the public rights-of-way, such as utilities, to ensure that the principles and practices of Complete Streets are embedded within their planning, design, construction, and maintenance activities.

Figure T-1: Sample Complete Streets Cross Section

Sidewalk | Parking | Bike Lane | Travel Lane | Turning Lane | Travel Lane | Bike Lane | Parking | Sidewalk

Landscape Strip — Curb to Curb — Landscape Strip

Right-of-Way

Policy T 3.1 **Complete Street Implementation**

For all street projects and improvements affecting the public right-of way, consider and incorporate Complete Street principles and design standards that provide mobility for all types of transportation modes (pedestrian, bicycle, auto, transit, freight) and support mutually-reinforcing land use and transportation decisions. Work with NCDOT to implement these design standards for state-maintained roads within the city's jurisdiction.

See Text Box: Implementing a Complete Streets Network

Policy T 3.2 **Accommodating Multiple Users**

Ensure that all new roadway projects and major reconstruction projects provide appropriate and adequate right-of-way for safe and convenient movement for all users including bicyclists, pedestrians, transit riders, and motorists. Manage the use of rights-of-way to best serve future travel demand (e.g., Multimodal Streets—incorporate wider sidewalks where appropriate).

Policy T 3.3 **Redefining LOS**

Expand the city's use of level of service standards to include bicycle (BLOS), pedestrian (PLOS), and transit (TLOS) levels of service.

Policy T 3.4 **Pedestrian-friendly Road Design**

Design Complete Street amenities with the pedestrian in mind, avoiding the use of traffic control and safety devices that favor vehicles.

Policy T 3.5 **Medians**

Limit the use of undivided multi-lane streets and utilize raised or landscaped medians, where feasible, to improve safety and vehicle throughput while providing opportunities for pedestrian refuges and landscaping.

Action T 3.1 Completed 2014

- -

Action T 3.2 Completed 2014

- -

Action T 3.3 Completed 2013

- -

Action T 3.4 Transportation Data Collection

Collect data that supports the monitoring of roadway, transit, bicycle, and pedestrian performance measures such as level of service. (Refer to Bicycle Transportation Plan to obtain BLOS)

- -

Action T 3.5 Completed 2016

- -

4.4 Public Transportation

Transit plays a key role in furthering the city's commitment to environmental stewardship, economic strength and social integrity. From the first privately owned mule-drawn trolley in Raleigh in 1886 to the conversion of electric streetcars to diesel motor coaches in 1933 and to the present-day public service providers connecting destinations throughout the city and the Triangle region, public mass transportation has played an essential role in providing mobility to the city's citizens and visitors. The presence of a robust transit system that provides a legitimate alternative to the automobile is a critical element of overall community sustainability.

Transit supports social, economic, and environmental sustainability in the following ways:

- *Social – By providing mobility choice and access to the public, regardless of age, disability, preference to drive, or financial resources and also by supporting active transportation that has health benefits.*

- *Economic – By providing a critical role in linking residents to jobs, by catalyzing sustainable economic development and also by reducing the financial burden of transportation to the local and regional economy.*

- *Environmental – By reducing vehicle miles traveled, energy consumption, carbon emissions, shortening trip lengths, improving air quality, as well as supporting land development that consumes less land.*

Transit best achieves these goals when frequent service is provided to high-ridership locations and when development density is increased in areas with frequent service. Because financial resources are finite, frequent transit service cannot and should not be provided everywhere in the city. The Comprehensive Plan establishes a vision and policy statements in order to clearly communicate to residents, developers, business and institutions where frequent transit services will be provided. These policies are followed by measurable goals and action items for the city to pursue.

The Wake County Transit Plan process (*see Text Box; Wake County Transit Plan*), which took place in 2015 and 2016, addressed major questions about the future of transit in the region. It involved analysis not just of types of transit but also of broad goals and trade-offs. These included whether transit should serve more people, by creating high-frequency and higher-speed routes that connect major centers, or cover more area, by spreading resources across a wider area at the cost of less frequency and slower speeds. The process included a strong preference for achieving higher ridership.

Ultimately, the city's goal is an economically, socially, and environmentally sustainable public transportation system that is vital to the community and supports freedom by expanding the quantity and quality of mobility choices, that complements broader comprehensive planning policies, and helps promote the region's larger public transit vision.

The city has several specific goals for its transit system, including:

- **Mode Share**. *Increase non-single occupancy vehicle mode share by emphasizing a network that prioritizes ridership, by focusing on high-frequency routes that connect major population centers with major destinations, over coverage.*

- **Metrics.** *Improve system quality and efficiency as measured by metrics such as passenger trips per unit of service, units of service per local investment and service reliability.*

- **Frequent Network**. *Increase span of service and frequency to growth centers and in priority transit corridors.*

- **Appeal.** *Improve the appeal of the system so that citizens consider it an attractive and viable transportation choice.*

- **Regional Transit**. *Promote regional transit across the Triangle by providing effective connections to other local and regional transit providers.*

- **Innovation through Technology and Partnerships**. *Leverage civic, academic and other resources in the city and the region to foster innovative technological improvements to the public transit system.*

Public transportation services in the City of Raleigh are provided by GoRaleigh, GoTriangle (TTA) and North Carolina State University (Wolfline). Additionally, several municipalities in Wake County contract with these agencies to provide express commuter service to the City of Raleigh.

In addition to being the primary provider of local fixed-route transit services, GoRaleigh also provides paratransit services through the GoRaleigh Access program to locations generally within the city's boundaries. GoRaleigh receives local funding from the City of Raleigh and is governed by the Raleigh Transit Authority (RTA), a board of nine citizens appointed by the Raleigh City Council.

While Raleigh supports efforts for a regional transit system, emphasis must also be placed on improving transit services within the city.

Additional transit services will be required to enhance mobility options, reduce vehicle miles traveled, and encourage transit-oriented development around planned transit station areas. Transit connections need to be considered for the major trip generators in Raleigh (examples include Wake Medical Campus, NCSU, downtown Raleigh, Crabtree, the Blue Ridge corridor, Highwoods). Further, enhanced local bus service will be needed to deliver riders to new rail stations, reducing the need to drive to these stations.

Policies in this section seek to foster increased transit use through the extension of existing lines, the provision of new services, increased frequency of service, and the provision of direct pedestrian and bicycle access to transit station areas. Increased transit use will further the city's efforts to become more sustainable and energy efficient. Transit and land use will be tightly linked, with transit stations integrated into walkable, transit-oriented developments. Plans will be developed for new transit services such as commuter rail, bus rapid transit (BRT), new bus routes between activity centers, and neighborhood bus service. Planned transit facilities are shown in Map T-2.

See also 14.1 'Transportation Investments' in Section 14: 'Regional and Inter-Jurisdictional Coordination' for related policies.

Wake County Transit Plan

The Wake County Board of Commissioners voted to officially adopt the recommended Wake County Transit Plan in June 2016. They joined the governing boards of the Capital Area Metropolitan Planning Organization and GoTriangle, which approved the plan and corresponding Transit Governance Interlocal Agreement in May 2016. The final report covers three major categories of investment: increased bus service, implementation of bus rapid transit (BRT) and implementation of commuter rail transit.

Increased Bus Service

- *This would expand bus service throughout the region to connect communities, specifically:*

- *Expand existing frequent bus service from 17 to 83 miles, with service at least every 15 minutes throughout the day.*

- *Improve links between colleges and universities, employment centers, medical facilities, dense residential areas, RDU Airport and downtowns.*

- *Implement consistent seven-day-a-week service, with the same schedule on Sunday as on Monday.*

- *Operate routes every 30-60 minutes to provide more coverage across Wake County.*

Bus Rapid Transit (BRT)

BRT involves building dedicated bus lanes on local roads, so bus operators can bypass traffic and keep their routes on schedule. To implement BRT for the first time in Wake County, the plan will construct approximately 20 miles of BRT-related infrastructure improvements. Four initial BRT corridors have been identified:

- *New Bern Avenue between Raleigh Boulevard and near WakeMed.*

- *Capital Boulevard between Peace Street and the Wake Forest Road intersection.*

- *South Wilmington Street towards Garner.*

- *Western Boulevard between Raleigh and Cary.*

Along these corridors, buses would have priority treatment at traffic signals. BRT stations will allow off-board fare payment and feature raised platforms, making it easier for passengers with wheelchairs, strollers or bicycles to board the bus.

Commuter Rail Transit (CRT)

CRT will use existing railroad tracks to provide comfortable passenger service that allows riders to relax or work on their way to key destinations.

- *37 miles of CRT would be in place from Garner to downtown Raleigh, N.C. State University, Cary, Morrisville and the Research Triangle Park continuing to Durham.*

- *Up to eight trips would run in each direction during peak hours.*

- *One to two trips would run each way during midday and evening hours.*

- *Will leverage the bus network to connect riders with key destinations like RDU Airport.*

Implementation

It will cost about $2.3 billion to build and operate the elements of this plan over the first 10 years.

The transit plan is designed to be funded through a combination of local, state and federal dollars, as well as farebox revenue. The main funding source for the transit plan is the local half-cent sales tax, which was approved by voters in 2016. Local funding would also include increased vehicle registration fees.

Policy T 4.1 Promoting Transit

Promote and support quality transit services to enhance mobility options and to meet the needs of the city's residents and visitors, with a focus on transit-dependent households.

Policy T 4.2 Short-term Bus Improvements

Enhance local and regional bus transit service in the short-term along key corridors where long-term bus rapid transit improvements are planned and identified in the Wake County Transit Plan.

Policy T 4.3 High-quality Priorities

Prioritize high-quality frequent transit investments in corridors with the greatest potential to attract riders and shape development and redevelopment.

Policy T 4.4 Right-of-way Reservation for Transit

Preserve right-of-way for future transit and require that new development and redevelopment provide transit easements for planned alignments, rail stations, and bus stops within existing and planned transit corridors as identified in the Wake County Transit Plan.

Policy T 4.5 Transit Efficiency

Promote transit efficiency by reducing waiting time and transfer time within the GoRaleigh system and to other transit providers.

Policy T 4.6 Event-based Transit Services

Substitute event-based transit services for on-site parking capacity where feasible, to free land for other uses around event locations.

Policy T 4.7 Transit Availability

Increase the availability of public transportation between residential and employment areas, as well as to regional facilities such as RDU International Airport and Research Triangle Park.

Policy T 4.8 Bus Waiting Areas

Developments located within existing and planned bus transit corridors should coordinate with GoRaleigh to provide a stop facility that is lit and includes a shelter, bench, a waste receptacle, and other amenities as appropriate.
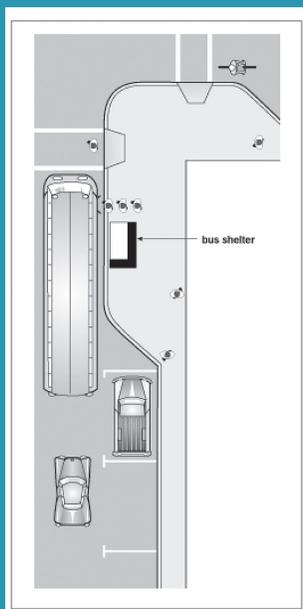
Picture T-3
Bus Stop Design

Bus Stop Standards (distances represent the appropriate no parking zone to encompass the actual stopping point of the bus, plus room for it to approach and leave the stop)

bus shelter

Near side of intersection:
85 – 100 feet in length

Mid-block:
130 – 175 feet in length

Far side of intersection:
80 – 85 feet in length

Policy T 4.9 Pedestrian and Bicycle Improvements Near Transit

Coordinate with local transit providers to identify pedestrian and/or bicycle needs within a reasonable distance of transit stops in need of enhancement for all transit users, including persons with disabilities.

Policy T 4.10 Transit-first Features

Incorporate features such as traffic signal priority, queue jumps, and exclusive transit lanes to improve transit operations and reliability, where appropriate.

Policy T 4.11 Demand-responsive Transit

Support the provision of demand-responsive services (e.g., expansion of GoRaleigh Access and other transportation services for those unable to use conventional transit).

Policy T 4.12 Special Needs

Provide adequate and accessible transit for residents and visitors with special needs, including senior citizens, the disabled, and transit-dependent persons.

Policy T 4.13 Crosstown Travel

Create routes and a network of secondary transfer hubs that facilitate crosstown and suburb-to-suburb travel patterns.

Policy T 4.14 Growth Centers

Provide circulator services to facilitate mobility within identified City Growth Centers (*See the Growth Framework Map in Section 2. Framework*) and to connect these centers with fixed-guideway stops and major transit routes.

Policy T 4.15 Enhanced Rider Amenities

Promote the use of transit facilities and services through enhanced pedestrian access and provisions for seating, shelter, and amenities.

Policy T 4.16 Bus Stop Spacing

Explore opportunities to provide more widely spaced bus stops with higher amenity levels, trading shorter walking distances with faster transit service and better facilities.

Policy T 4.17 **Reserved**

Policy T 4.18 **Transit Service Coordination**

Coordinate local bus route and schedule planning, including feeder services, with new fixed-guideway services, as they become available.

Policy T 4.19 **Service Targets and Evaluation**

Establish service and performance targets for the transit system to support the city's overall vision for public transportation. Monitor the effectiveness of transit plan implementation and overall service performance to inform future planning efforts.

Policy T 4.20 **Transit Efficiency**

Transit planning outcomes should equally value existing riders and potential riders, work based trips and non-work based trips, and finally door-to-door travel times and stop-to-stop travel times.

Policy T 4.21 **System Appeal**

Improve the appeal of the transit system through marketing, outreach, and education campaigns.

Policy T 4.22 **Regional Transit**

Lead, support, and develop countywide and regional public transportation services that contribute to the continued prosperity of the City of Raleigh, Wake County and the Triangle region. Lead regional planning efforts to improve transit services and pursue a regional transit system. Ensure local planning efforts are compatible with the regional vision.

Policy T 4.23 **Bike, Ride and Car Share as Public Transportation**

Consider bike, ride and car share to be a component of the city's public transportation network. Plan how to accommodate these forms of transportation and to coordinate them with existing and future transit services.

Policy T 4.24 **Innovation**

The city's transit and transportation demand management (TDM) efforts should reach out to innovators in the city to leverage grassroots resources and develop creative technology solutions that benefit public transportation users

Action T 4.1 **Multimodal Transportation Center**

Continue to implement subsequent phases of the Raleigh Union Station project. Upon completion, the proposed central station will link multiple travel modes, including local, regional, and long-distance bus; regional, commuter, and long-distance passenger rail (Phase I); and taxis, cars, and bicycles.

Action T 4.2 **Transit Stop Evaluations**

Evaluate transit stops to determine their convenience and effectiveness to serve riders and support land use policies.

Action T 4.3 **Removed 2018**

Action T 4.4 **Removed 2018**

Action T 4.5 **Completed 2016**

Action T 4.6 Park and Ride Lots

Locate park and ride lots along the fringes of the city, with a direct connection to transit. Specifically, develop park and ride facilities along the following corridors: Capital Boulevard/Atlantic Avenue; Six Forks Road; Glenwood Avenue; Creedmoor Road; and New Bern Avenue. Also develop enhanced park and ride facilities in West Raleigh in the Arena area and in the South Saunders/Tryon Road area.

Action T 4.7 Shared Parking and Transit

Evaluate the need and benefits of shared park and ride lots in areas that have significant unused daytime parking, such as shopping malls. Work with property owners and local communities to allocate off-street parking surpluses for carpooling and transit users.

Action T 4.8 Secondary Transit Hubs

Enhance secondary transit hubs at Crabtree ValleyMall, NCSU, Triangle Town Center, and WakeMed. Establish new hubs in south Raleigh near Garner, New Bern at New Hope, and explore the potential for additional bus as the system expands.

Action T 4.9 Completed 2016

Action T 4.10 Local Financing for Transit

Pursue local and innovative financing options, beyond the transit sales tax, to assist in funding transit infrastructure investments.

Action T 4.11 **Completed 2015**

Action T 4.12 **Bench and Shelter Siting**

Work with NCDOT to modernize the rules governing state-maintained roadways, to facilitate the placement of benches and shelters along Raleigh's major transit corridors.

Action T 4.13 **Completed 2012**

Action T 4.14 **Service Targets**

Establish policy statements and service targets for mode-share and for ridership versus coverage, and establish timeframes for achieving these goals.

Action T 4.15 **Frequent Network Map**

Create a series of frequent network maps for public distribution that show where existing all-day frequent transit service is available.

Action T 4.16 **Downtown Services**

Investigate opportunities to improve the utility of public transportation services in downtown Raleigh, such as evaluating a potential fare-free downtown transit district that promotes the use of transit for short trips downtown. Evaluate the potential to consolidate fixed-route services into select transit corridors to create a downtown frequent network of services.

Action T 4.17 **Paratransit Efficiency and Coordination**

Investigate opportunities to improve paratransit service by identifying opportunities to coordinate with larger employers to create new fixed-route services where appropriate. Identify opportunities to improve the efficiency and quality of city-provided paratransit services to ensure that the city can continue to provide an effective paratransit service.


Action T 4.18 **Public Education and Marketing**

Develop a public outreach campaign to identify public perception problems with public transportation and propose a framework for addressing concerns and educating the public to improve the appeal of the overall system.

Action T 4.19 **Bike, Ride and Car Share**

Identify opportunities to creatively leverage bike, ride and car share systems to augment public transit, enhance system connectivity, and reduce transit trip travel times. Identify creative ways to share local operating funds between these services and public transit that results in a more cost-effective network.

T-2: **Planned Transit Facilities**

Legend:
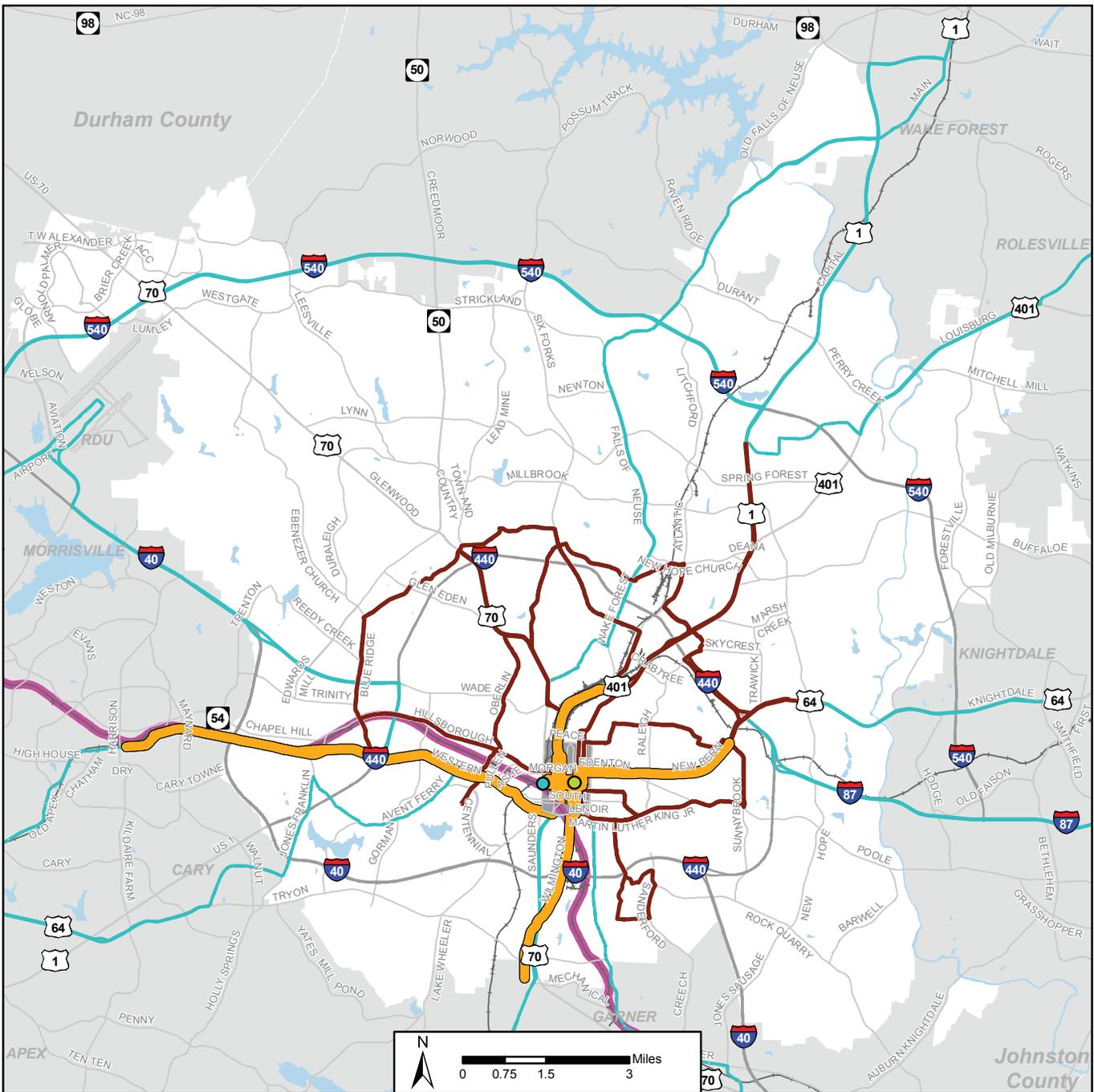
— Frequent Bus Network*

— Regional Bus Connections*

▢ Downtown*

— Commuter Rail Corridor

— Bus Rapid Transit Corridor

● Raleigh Union Station

● GoRaleigh Station

*Routes shown are representational and may not reflect final alignments as further planning is undertaken to implement the recommendations of the Wake Transit Plan. Alignments in Downtown will be further refined in a separate study.

4.5 Pedestrian and Bicycle Circulation

Bicycles and pedestrians are important components of Raleigh's transportation system. There are significant gaps in the bicycle and pedestrian networks that hinder effective and safe circulation. This is particularly important in key locations such as retail and mixed-use centers, schools, libraries, and parks. The quality of life will be greatly enhanced in Raleigh by investing in bicycle and pedestrian networks and amenities.

Policies in this section support the goal of providing Raleigh with a safe, walkable, and bikeable environment through a continuous pedestrian and bicycle network. Residents will be encouraged to integrate bicycling and walking into their daily activities to promote a healthier lifestyle and improve energy conservation. The construction of a comprehensive citywide bicycle and pedestrian network, support facilities such as convenient and secure bicycle parking, and an educated driving and bicycling public will facilitate increased bicycling and walking. The existing and planned bicycle and pedestrian facilities are displayed in Map T-3.

Policy T 5.1 Enhancing Bike/Pedestrian Circulation

Enhance pedestrian and bicycle circulation, access, and safety along corridors, downtown, in activity and employment centers, at densely developed areas and transit stations, and near schools, libraries, and parks.

Policy T 5.2 Incorporating Bicycle and Pedestrian Improvements

All new developments, roadway reconstruction projects, and roadway resurfacing projects in the City of Raleigh's jurisdiction should include appropriate bicycle facilities shown in the Recommended Bikeway Network contained in the city's BikeRaleigh Plan.

Policy T 5.3 Bicycle and Pedestrian Mobility

Maintain and construct safe and convenient pedestrian and bicycle facilities that are universally accessible, adequately illuminated, and properly designed to reduce conflicts among motor vehicles, bicycles, and pedestrians.

Policy T 5.4 Pedestrian and Bicycle Network Connectivity

Continuous pedestrian and bicycle networks should be provided within and between existing and new developments to facilitate safe and convenient pedestrian and bicycle travel free of major barriers and impediments such as cul-de-sacs and large parking lots.

Policy T 5.5 Sidewalk Requirements

New subdivisions and developments should provide sidewalks on both sides of the street.

Policy T 5.6 Bridges, Underpasses, and Interchanges

Pedestrians and bicyclists shall be accommodated on roadway bridges, underpasses, and interchanges (except on roadways where they are prohibited by law). Bicycle lanes and wide sidewalks should be included on all new bridges and underpasses (requires NCDOT coordination on state-maintained roads).

Policy T 5.7 Capital Area Greenway

Treat the Capital Area Greenway trail system as part of the city's transportation network for bicycles and pedestrians and plan connections to the system accordingly.

Policy T 5.8 **Workplace Bicycle Facilities**

Encourage bicycle facilities, such as secured bicycle racks, personal lockers, and showers for new and existing office developments to encourage bicycling as an alternative mode for work commutes.

Policy T 5.9 **Pedestrian Networks**

New subdivisions and large-scale developments should include safe pedestrian walkways or multi-use paths that provide direct links between roadways and major destinations such as transit stops, schools, parks, and shopping centers.

Policy T 5.10 **Building Orientation**

All primary building entrances should front onto a publicly accessible, and easily discernible, and ADA-compliant walkway that leads directly from the street to the front door to improve pedestrian access.

Policy T 5.11 **New Bike Routes**

Convert underused right-of-way along travel lanes and railroad corridors to bikeways or widen outside lanes wherever possible and desirable.

Policy T 5.12 **Safe Routes to School**

Support infrastructure and programs that encourage children to walk and bicycle safely to school. Coordinate with Wake County Public School System and NCDOT Bike/Pedestrian Division to identify projects eligible for "Safe Routes to Schools" funding.

Policy T 5.13 **Pedestrian Infrastructure**

Ensure that streets in areas with high levels of pedestrian activity (employment centers, residential areas, mixed-use areas, schools) support pedestrian travel by providing such elements as frequent and safe pedestrian crossings, large medians for pedestrian refuges, bicycle lanes, frontage roads with on-street parking, and/or grade separated crossings.

Policy T 5.14 **Rails to Trails**

Encourage the development of greenway trails along existing rail corridors.

Action T 5.1 **Completed 2014**

Action T 5.2 **Completed 2014**

Action T 5.3 **Completed 2013**

Action T 5.4 **Completed 2012**

Action T 5.5 **Trail and Path Width**

Develop and maintain greenway trails and multi-use paths to be no less than ten feet wide as identified in the BikeRaleigh Plan and current AASHTO standards.

Action T 5.6 **Bicycle Plan Implementation**

Maintain and implement the BikeRaleigh Plan.

Action T 5.7 **Completed 2011**

Action T 5.8 **Completed 2013**

Action T 5.9 **Personal Motorized Modes**

Consider how and to what extent personal motorized modes of travel, including Segways and other emerging Personal Accessibility Vehicles (PAVs), might safely be accommodated within the pedestrian and bicycle network

Action T 5.10 **Pedestrian Crossing Standards**

Establish standards for maximum distances between pedestrian crossings that are also associated with roadway classification to enhance walking and transit use.

Action T 5.11 **Crosswalk Safety**

Widen crosswalks and install durable painted crosswalks and/or other investments to increase pedestrian safety and visibility at crossings.

Action T 5.12 **Completed 2015**

Action T 5.13 **Completed 2014**

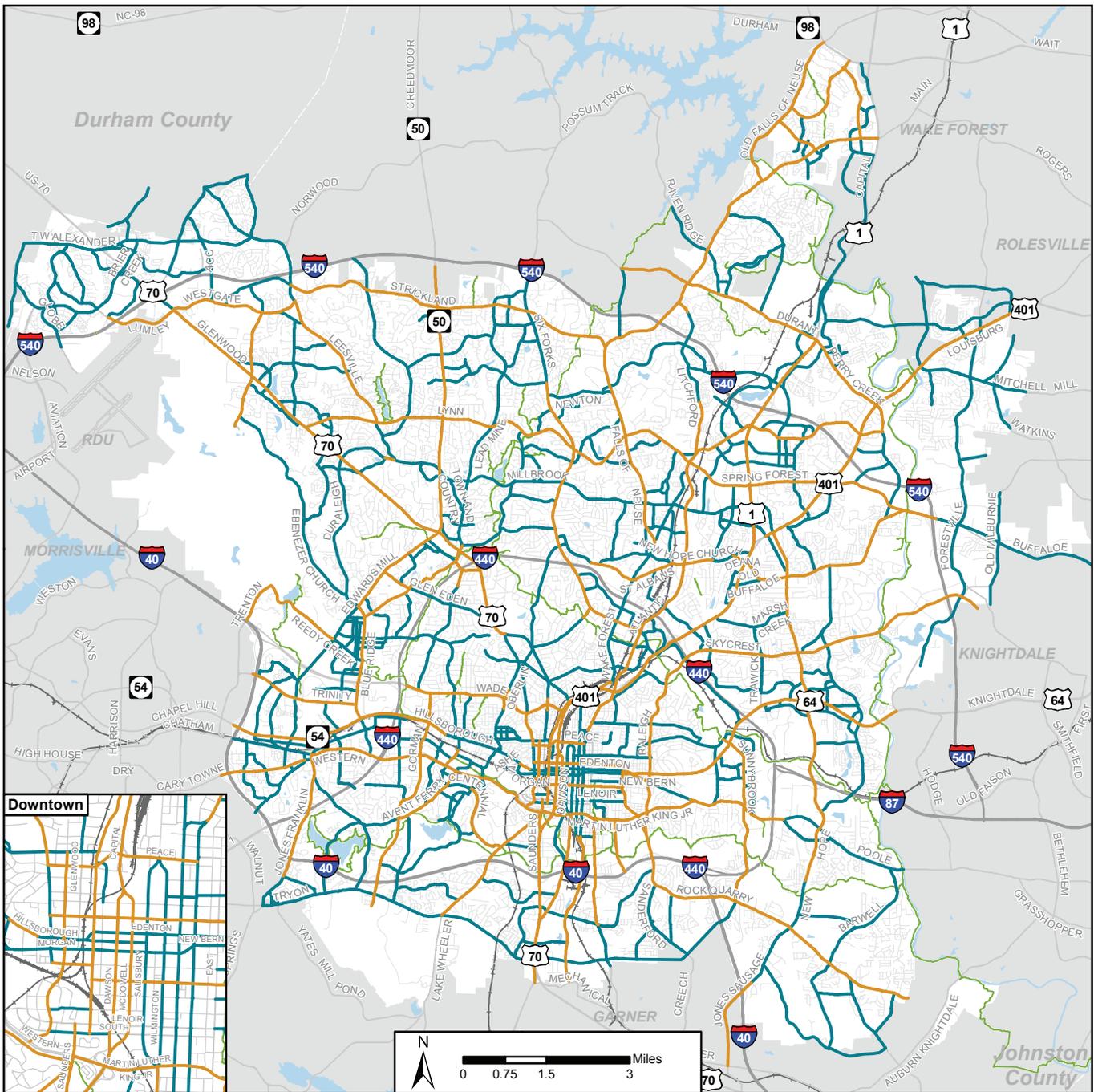Action T 5.14 **Railroad Greenway Trails**

Partner with railroad entities to locate additional greenway trails along existing rail lines.

Action T 5.15 **Bikeshare**

Implement the recommendations of the 2014 Raleigh Bikeshare Feasibility Study.

T-3: **Planned Bicycle Facilities**

Long Term Planned Facility

—— Bicycle Lane

—— Separated Bikeway

—— Existing Greenway Trail

4.6 Parking Management

While Raleigh currently has parking standards, there is a need to modify and enforce these standards to optimize supply. In some instances there is an over-abundance of parking supply, incentivizing single-occupancy vehicle (SOV) travel. By managing and pricing the parking supply, the city can encourage transit, bicycling, and walking as means of travel. This also results in positive effects to air quality and reduces overall congestion on the roadway network.

Policies in this section focus on providing sufficient parking for businesses, while protecting adjacent land uses and the environment. Reduced parking requirements will be provided where appropriate to promote walkable communities and alternative modes of transportation. On-street parking use and shared parking will be maximized through the use of parking management tools.

Policy T 6.1 Surface Parking Alternatives

Reduce the amount of land devoted to parking through measures such as development of parking structures and underground parking, the application of shared parking for mixed-use developments, flexible ordinance requirements, maximum parking standards, and the implementation of Transportation Demand Management plans to reduce parking needs.

Policy T 6.2 Transit Station Parking

Establish a transit station area parking program and management strategies for proposed and planned transit stations.

Policy T 6.3 Parking as a Buffer

Encourage the location of on-street parking and drop-off areas adjacent to sidewalks as a buffer to vehicular traffic, and for customer convenience, and maximizing on-street parking turnover. Parking between sidewalk areas and building fronts should be minimized.

Policy T 6.4 Shared Parking

Strongly encourage shared-use car parking for land uses where peak parking demand occurs at different times of the day, reducing the total number of spaces required.

Shared Parking

Shared parking is the use of a parking space to serve two or more individual land uses without conflict or encroachment. The ability to share parking spaces is the result of two conditions: (1) variations in the accumulation of vehicles by hour, by day, or by season at the individual land uses; and (2) relationships among the land uses that result in visiting multiple land uses on the same auto trip. (Shared Parking, Urban Land Institute, 2005)

Policy T 6.5 Minimum Parking Standards

Reduce the minimum vehicle parking standards over time and as appropriate to promote walkable neighborhoods and to increase use of transit and bicycles.

Policy T 6.6 Parking Connectivity

Promote parking and development that encourage multiple destinations within an area to be connected by pedestrian trips.

Policy T 6.7 **Parking Demand Management**

Discourage single occupant vehicle trips through parking supply and pricing controls in areas where supply is limited and alternative transportation modes are available.

Policy T 6.8 **Parking Lot Design**

Parking areas should be designed to minimize conflicts with pedestrians.

See also '15.2 Transportation' in Section 15: 'Downtown Raleigh.'

Policy T 6.9 **Green Parking Facilities**

Reduce stormwater runoff generated by parking facilities by promoting an increase in the use of tree planting and landscaping, green roofs for parking decks, and permeable materials for parking lots, driveways, and walkways.

Policy T 6.10 **Parking Technology**

Use technological advances to make curbside and other parking easier to locate and pay for, and to potentially incorporate a dynamic pricing system aimed at ensuring that some spaces are always available in high-demand areas.

Action T 6.1 **Completed 2013**

Action T 6.2 **Shopping Center Park and Ride**

Require shopping centers on existing or planned transit routes that provide 400 or more parking spaces to designate at least 5 percent of the required spaces as "Park and Ride" spaces. In addition, amend the parking design standards in the Street Design Manual to encourage these spaces to be contiguous and located near the transit facility.

See also '4.4 Public Transportation.'

Action T 6.3 **Completed 2013**

Action T 6.4 **Completed 2014**

Action T 6.5 **Completed 2010**

4.7 Transportation Safety Improvements

While it is important to provide a multimodal transportation system that efficiently moves users to their destinations, it is more important that the users arrive to their destinations safely. Reducing the conflict points between modes, such as vehicles with bicycles and pedestrians, can greatly enhance safety.

Traffic calming is another way to enhance safety and is a common desire in many neighborhoods and communities. As traffic levels increase on major streets, drivers will use alternative routes to make their trips. This additional through traffic, which is typically generalized as traveling above posted speeds, is undesirable in residential areas.

Policies in this section support the provision of a safe multimodal transportation network for all users. Policies include consideration of traffic calming, bicycle and pedestrian crossings, and crash analysis.

Policy T 7.1 Safety Improvements

Work with all parties necessary to improve the multimodal transportation system so that safe routes for motorists, transit riders, bicycles, and pedestrians are provided.

Policy T 7.2 Traffic Calming

Incorporate traffic calming techniques and treatments into the design of new or retrofitted local and neighborhood streets, as well as within school, park, and pedestrian-oriented business areas, to emphasize lower auto speeds, encourage bicycling and walking, and provide pedestrians with a convenient, well-marked, and safe means to cross streets. Particular consideration should be given to traffic calming measures on streets where additional connectivity is planned.

Policy T 7.3 Transportation Safety Data

Maintain data necessary to assess roadway safety performance and support enforcement and education. Data may include traffic volume data for major roadway network facilities, geographically referenced crash report data for all modes, and crash report archives for injury crashes.

Policy T 7.4 Road Capacity and Safety

Evaluate and document the safety impacts of proposed roadway capacity projects including impacts to bicycle and pedestrian safety.

Policy T 7.5 Reducing Cut-through Traffic

Work with the community on an individual-project basis to identify feasible solutions to lessen the impacts of major street improvements on local streets.

Policy T 7.6 Low-speed Streets

The design speed for all Local Streets should not exceed 20 mph. The design speed for Mixed-Use Streets should not exceed 30 mph.

Action T 7.1 Street Lighting

Add street lights where necessary to critical intersections, bus shelter stops, and neighborhood dark spots and maintain existing street lights to enhance safety. Remove lights where they are unnecessary for safety and where a reduction in lighting would be an environmental enhancement.

Action T 7.2 Crash Analysis

Review locations with high vehicular crashes involving pedestrians and bicyclists to identify needed improvements.

Action T 7.3 Traffic Calming

Develop a process to evaluate, and when appropriate, include, traffic calming through new development when it adds street connectivity.

4.8 Commercial Truck and Rail Freight

The movement of freight, both by train and by truck, is an important part of Raleigh's economy. There are numerous at-grade railroad crossings that pose traffic and safety concerns as traffic increases on both the railroad and the roadway. Although some businesses are located along railroads and utilize trains for the movement of freight, a majority of freight operations involve trucks. The existing freight routes are displayed in Map T-4.

Policies in this section support the safe and efficient movement of goods via rail, truck, and air transportation modes. Policies also seek to reduce the impacts of rail and truck operations on adjacent neighborhoods and sensitive land uses.

Policy T 8.1 Truck Routes

Promote the safe and efficient movement of truck traffic in and around the city through designated truck routes and alternate truck routes for heavily-traveled corridors.

Policy T 8.2 Grade Separations

Outside of the downtown street grid, seek additional opportunities to provide grade-separated street connections across the city's passenger and freight rail corridors, and look to grade separate existing crossings where feasible and desirable.

Policy T 8.3 Intermodal Transfer of Goods

Support infrastructure improvements and the use of emerging technologies that facilitate the clearance, timely movement, and security of trade, including facilities for the efficient intermodal transfer of goods between truck, rail, and air transportation modes.

Action T 8.1 Railroad Crossing Safety

Monitor traffic and safety conditions for at-grade railroad crossings as freight traffic increases to determine the need for grade separations.

Action T 8.2 Improving Freight Movement

Identify and correct roadway design and operational deficiencies that affect the safe and efficient movement of freight on designated freight routes while maintaining the health and safety of residents.

T-4: **Freight Routes**

Legend:
- ━━ Rail Corridor
- ━━ Through Truck Route
- ━━ Local Truck Route
- ▪ Local Truck Area

4.9 Future Street Improvements

Policy T 9.1 Future Interchange Locations

Ensure that development projects adjacent to future interchange locations as shown on Map T-5 do not compromise the future ability to construct the proposed interchange or grade separation.

The following tables list identified improvements to major streets necessary to bring these streets up to the city's guidelines for cross section, create new points of connection, and to ensure adequate vehicular capacity into the future. The tables address two types of improvements. New Location projects, listed in Table T-2, involve the extension of existing roadways and the creation of new connections. These correspond to the dashed lines on Map T-1: Street Plan.

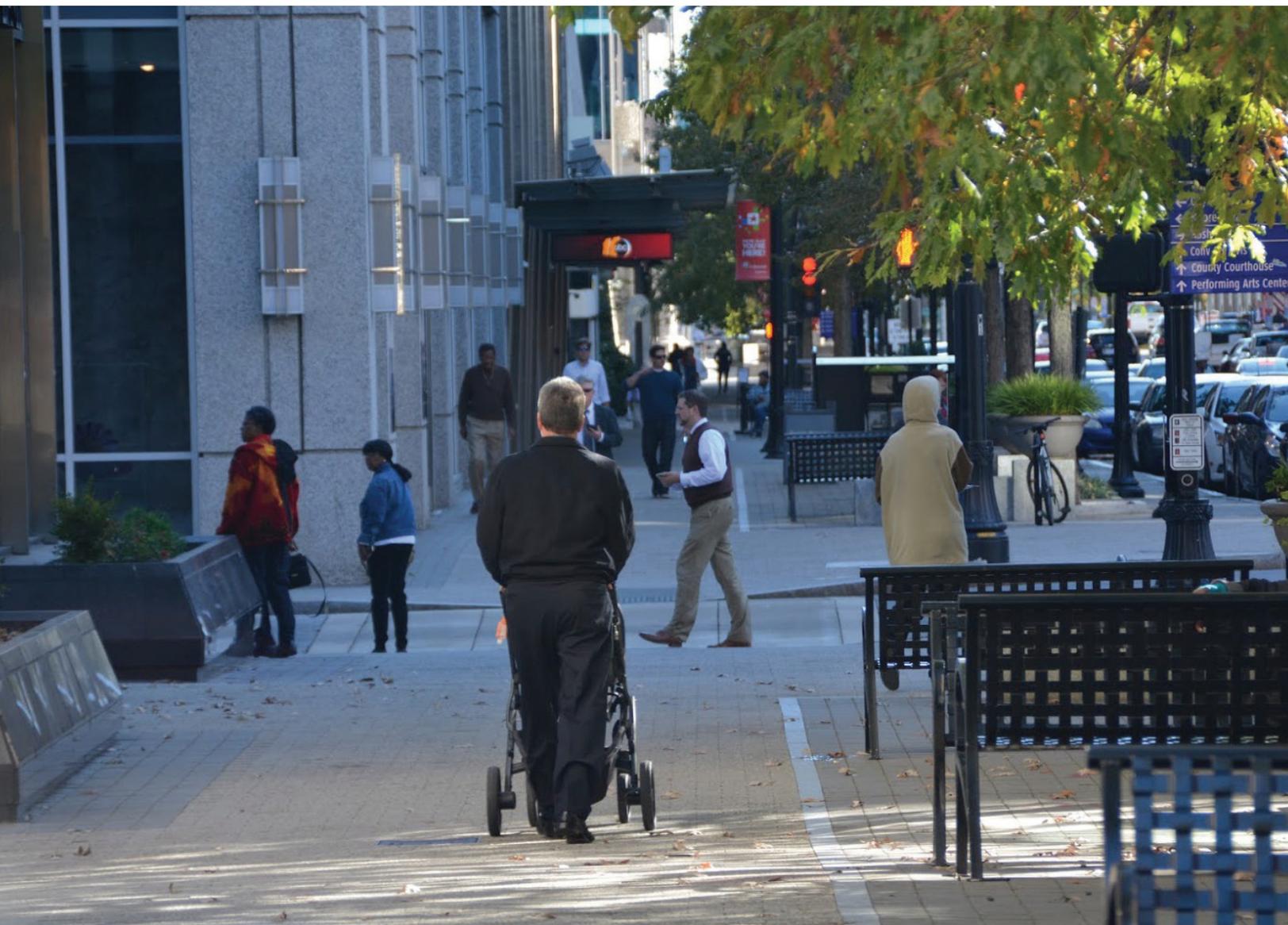*See also '4.2 Roadway System and Transportation Demand Management.'*

Table T-2 New Location Projects

Street Name	Segment Description	Proposed Future Cross-Section
ACC Boulevard	Existing ACC Boulevard to Leesville-Westgate Connector	3 lanes
Auburn-Knightdale Road	Bethlehem Road to existing Auburn-Knightdale Road	4-lane divided
Aviation Parkway	Brier Creek Parkway to Wake County line	Freeway
Beckom Drive	Spring Forest Road Ext to Perry Creek Road Ext	3 lanes
Brier Creek Parkway	TW Alexander Parkway Ext to Andrews Chapel Road	4-lane divided
Capital Boulevard	Realign U.S. 1 from south of Durant Road to Thorton Road	Freeway
Carpenter Pond Road	Hickory Grove Church Road to Wake County line	4-lane divided
Carpenter Pond Road	West of Olive Branch Road to existing Carpenter Pond Road	4-lane divided
Crabtree Valley Avenue	Blue Ridge Road to Glenwood Avenue	4-lane divided
Creech Road	Sanderford Road to Wilmington Road	2-lane divided
Dunn Road	Falls River Avenue to Durant Road	3 lanes
Edwards Mill Road	Chapel Hill Road to Western Boulevard	4-lane divided
Edwards Mill Road	Western Boulevard Extension to existing Edwards Mill Road	4-lane divided
Globe Road	East of Page Road to Durham County	6-lane divided
Greshams Lake Road	Reba Drive to Capital Boulevard	2-lane divided
Highwoods Boulevard	Realign Highwoods Boulevard to Westinghouse Boulevard	4-lane divided
Hodge Road	Auburn-Knightdale Road to existing Hodge Road	4-lane divided
Hodge Road	Knightdale Boulevard to Old Milburnie Road	4-lane divided

Street Name	Segment Description	Proposed Future Cross-Section
Lake Boone Trail	Atrium Drive to Edwards Mill Road	4-lane divided
Leesville-Westgate Connector	Westgate Road to Leesville Road	4-lane divided
Louisbury Road	Mitchell Mill Road to existing Louisbury Road	3 lanes
Morgan Street Extension	Existing Morgan Street to Ashe Avenue	2 lanes
New Leesville Boulevard	Existing New Leesville Boulevard to Carpenter Pond Road and Realign intersection of Carpenter Pond Road and Shady Grove Road	4-lane divided
New Pearl Road	Pearl Road to Wall Store Road	3 lanes
Old Milburnie Road	Forestville Road to existing Old Milburnie Road	3 lanes
Page Road	Glenwood Avenue to east of Aviation Parkway Extension	4-lane divided
Pearl Road/Barwell Road Realignment	Realign Pearl Road at Barwell Road intersection	3 lanes
Perry Creek Road	Fox Road to Buffaloe Road	4-lane divided
Poyner Road	Burcliff Place to Longhill Lane	2 lanes
Rogers Lane	New Bern Avenue to existing Rogers Lane	4-lane divided
Shady Grove Road Realignment	North of N. Exeter Way to existing Shady Grove Road	4-lane divided
Six Forks Road	East of Atlantic Avenue to Capital Boulevard	4-lane divided
Skycrest Drive	Southall Road to Forestville Road	4-lane divided
Southall Road	Rogers Lane to Raleigh Beach Road	4-lane divided
Southall Road	Skycrest Drive to existing Southall Road	3-lane divided
Southall Road	Groundwater Place to Hedingham Boulevard	4-lane divided
Spring Forest Road	Louisburg Road to Buffaloe Road	4-lane divided

Street Name	Segment Description	Proposed Future Cross-Section
Sumner Boulevard	Old Wake Forest Road to Capital Boulevard	5 lanes
Sumner Boulevard	Ruritana Street to Gresham Lake Road	3 lanes
Sunnybrook Road	Creech Road to existing Sunnybrook Road	4-lane divided
Triangle Town Boulevard	I-540 to Capital Boulevard	4-lane divided
Tryon Road	Cyrus Street to Sanderford Road	4-lane divided
TW Alexander Drive	Brier Creek Parkway to Leesville Road	4-lane divided
Watkins Road	Mitchell Mill Road to Louisbury Road	3 lanes
Western Boulevard	Jones Franklin Road to existing Western Boulevard	4-lane divided
Whitaker Mill Road	Atlantic Avenue to Six Forks Road	3 lanes

T-5: **Planned Interchanges and Grade Separations**
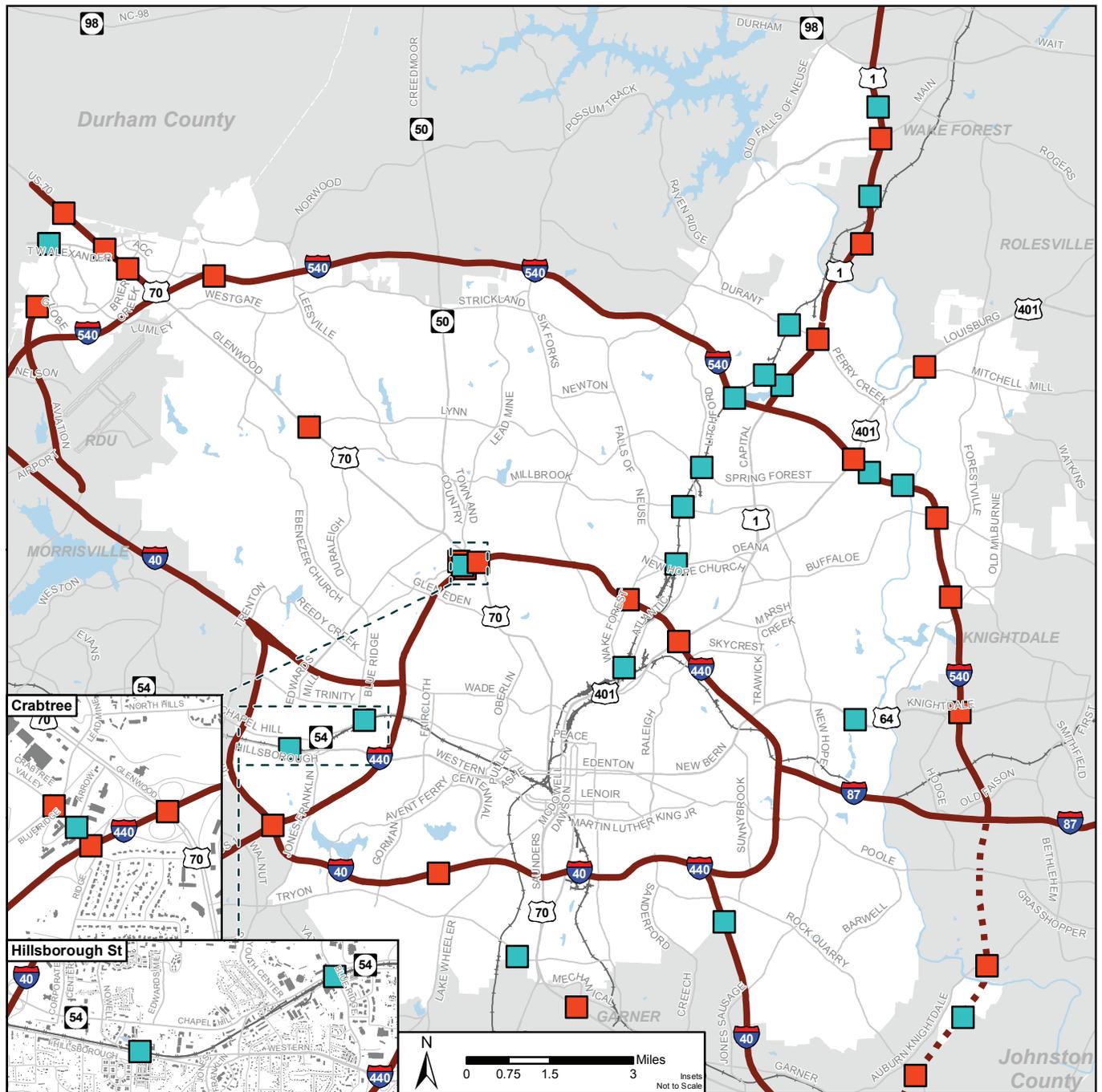
Planned Facilities

🟧	Interchange	▬▬▬	Current Limited Access Highway
🟦	Grade Separation	▪▪▪▪	Planned Limited Access Highway

4.10 Emerging Technologies

The field of transportation is in the midst of perhaps the broadest – and most disruptive – set of changes since the widespread adoption of personal automobiles several decades ago. In addition to the growing realization that accessibility – the proximity of residences with destinations such as workplaces, parks, and shopping districts – is as important as mobility, technological advances and policy innovations are changing how people move throughout Raleigh.

Most obviously, ride-hailing services such as Uber and Lyft have rapidly become a significant part of the mobility equation in recent years. This activity has many implications, from a growing demand for curbside drop-off space to potential effects on transit ridership and car ownership. Looking forward, automated vehicles seem likely to bring even more substantial impacts on both mobility and land use.

Other recent innovations include increasingly sophisticated bikeshare systems, both public and private, and improved tools for locating and paying for parking. Trip planning tools are allowing for better information about routes and options for different modes, and integrated fare payment systems are simplifying the process of trips that combine modes or providers.

The lessons of the past illuminate the possible futures created by these innovations. In the post-World War II era, few decisions were made that did not prioritize the movement of motor vehicles above other considerations. In recent decades, cities have better understood the costs of those decisions on the environment, public health, and the identity and desirability of the city. Recent policy has emphasized balancing automotive mobility with these and other considerations. Emerging technologies have created a new crossroads. This section aims to create policy that accommodates and encourages new technologies while ensuring that they serve broader goals, rather than shape policy in their own images.

Ride-hailing and Vehicle Sharing

The rapid growth in popularity of alternatives to vehicle ownership is shaping mobility. Vehicle sharing, which allows for a dispersed fleet of short-term rentals, and ride-hailing services, which provide simple means of making individual trips, offer additional choices for residents and visitors. These services can bring benefits such as increased mobility and, by providing an alternative to car ownership, a reduction in overall vehicle miles traveled. However, they can also diminish transit ridership and in some instances can increase transportation demand.

Both ride-hailing and vehicle sharing will affect future parking demand as well. While demand for on- or off-street parking is likely to diminish, there may be greater demands on curbside space in the form of drop-off areas. Future planning should take these effects into account.

Automated Vehicles

Automated vehicles may soon begin to have a major impact on the city's transportation system. Some analyses suggest that, in conjunction with a shift toward mobility as a service, they could reduce vehicle miles traveled by divorcing mobility from vehicle ownership. However, they also will reduce the perceived cost of driving by allowing travelers to perform other tasks and avoid the frustration of navigating in traffic. This effect could increase vehicle miles traveled and incentivize a more disperse land-use pattern.

Beyond the broader impacts, the introduction of automated vehicles will involve consideration of a number of planning and legal issues that would enable, or not, this technology. In coming years, the city will begin to consider and plan for the impact of automated vehicles, ranging from narrow legal questions to broad transportation and land use issues.

Policy T 10.1 **Automated Vehicles**

The inclusion of automated vehicles into the city's transportation system should support other goals, including reducing vehicle miles traveled, improving transportation safety, enhancing urban form, and supporting transit and other modes of travel.

Policy T 10.2 **Ride-hailing and Vehicle Sharing**

Ride-hailing, vehicle sharing, and other innovations to the city's transportation system should support other goals, including reducing vehicle miles traveled, improving transportation safety, and supporting transit and other modes of travel.

Policy T 10.3 **Curbside Space**

Consider, in future studies and street designs, changes in parking demand created by the increased popularity of ride-hailing and vehicle sharing services. Ensure that adequate space is provided for drop-off areas and that excessive off-street parking is not required or constructed. Make designated spaces available for vehicle sharing services.

Policy T 10.4 **Bikeshare**

Support bikeshare, both public and private, through city support of a public system and through appropriate regulation of any private systems.

Action T 10.1 **Curbside Space**

Study drop-off activity in high-demand locations (Glenwood South, Raleigh Convention Center, Performing Arts Center) and consider whether a reallocation of curbside space to provide additional drop-off zones is warranted.

Action T 10.2 **Parking Demand**

Study the effect of recent trends in transportation, particularly ride-hailing and vehicle sharing, on parking demand, both overall and for specific uses (such as hotels) and in specific areas. Reduce the amount of required parking as needed.

Action T 10.3 **Automated Vehicles**

Study the potential impact of automated vehicles and whether existing policy and regulation provide an adequate framework for accommodating automated vehicles into the city's transportation system. Consider how automated vehicles may affect travel demand and whether other transportation and land use policies may need to respond to these changes.