

# Apex Transportation Plan



## 2011 Plan Update

Town of Apex, North Carolina

# Apex Transportation Plan

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Town of Apex

# Transportation Plan Update

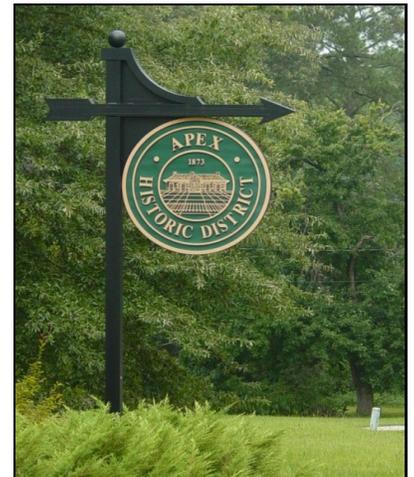
## 1.0 Introduction

The Town of Apex is located in southwest Wake County, generally between highways US 1 and US 64. Its location, southwest of Raleigh and Cary and south of Research Triangle Park, makes it an attractive residential location for people who work in the surrounding communities. Despite rapid growth in the past decade, Apex has maintained the small-town atmosphere its residents cherish. The downtown area is comprised of a grid of interconnected streets, while the outskirts consist of new suburban-oriented development intermingled with older rural farms and residences. Salem Street is the core of the historic downtown area and is lined with thriving businesses in preserved and restored storefronts.

Today, Apex is primarily a satellite town with most new growth coming from residential and commercial development. The majority of traffic generated during peak travel periods is attributed to commuters traveling to the region's employment centers such as Research Triangle Park (RTP) and downtown Raleigh. Other peak hour traffic generators in the Town include EMC<sup>2</sup> Corporation, Apex Tool Group,

Tipper Tie, Apex High School, Apex Middle School, and several elementary schools. Beaver Creek Commons, Beaver Creek Crossings, WakeMed Healthplex, and Broadstone Station have led to an increase in the local traffic in recent years which continues to impact major thoroughfares in Apex.

Living up to its motto as the "Peak of Good Living," the Town of Apex is rich in history and brimming with opportunities. This town has earned the reputation for a willingness to grow



The Historic District is one of the most visible aspects of Apex.



while remaining true to its small-town roots as a railroad community. In 2007, Apex was ranked #14 in the nation (and first in North Carolina) by *Money Magazine's 100 Best Places in America to Live*. Apex has a revitalized downtown listed on the National Register of Historic Places. Yet Apex is still changing.

Between 1990 and 2010, the population grew from 5,000 to over 37,000. Current predictions estimate the town population to reach 43,000 by 2015 and 70,000 by 2030. Inevitably, this kind of growth is accompanied by more people driving on the roads, more people in search of convenient ways to travel around town, and more demand for transportation amenities. In order to maintain the quality of life for which Apex is recognized while supporting this growth, the town must plan for future transportation needs.



The Scotts Mill neighborhood is a popular place to live and shop.

### 1.1 About the Apex Transportation Plan



A boardwalk along the Beaver Creek Greenway connects Beaver Creek Commons with the Becketts Crossing neighborhood.

This document is an update of the original Apex Transportation Plan from 2002 with current information regarding the changes that have happened to the Apex community and the transportation network. The Plan identifies both general and specific transportation system improvement recommendations and strategies to help accommodate this growth in travel demand. At the same time, these recommendations are intended to support a diversified transportation system that considers not only the motorist, but also the bicyclist, the pedestrian, and the transit patron. This plan also examines how the Parks, Recreation, Greenways, and Open Space Master Plan, as well as other small area plans, can be incorporated into the overall transportation network. Finally, the Apex Transportation Plan includes discussion on strategies, methods, and sources of funding for implementation.

The goal of the Plan is to provide mobility for Apex residents and choice in travel, by foot, bicycle, car, or transit. In addition to discussion of transportation issues and needs, this Plan provides objectives to measure successful implementation of the policies and goals herein.

### 1.2 Public Process

The citizens of Apex are a key component of the Apex Transportation Plan document. Citizens have an intimate knowledge of the issues and opportunities specific to the places they live and travel, as well as the problems they encounter along the way. Input received through the public hearing process, workshops, meetings, telephone calls, and e-mails was used to update the Plan.

To ensure that the Apex Transportation Plan considered these important issues while also keeping the community's best interest in mind, a Transportation Plan Advisory Group (TPAG) was formed and engaged early in the planning process for the original plan. In order to make sure that the community was adequately represented, citizens from a broad range of backgrounds were invited to participate in the TPAG.

The first task undertaken by the TPAG was to generate a list of the characteristics of Apex, specifically of the transportation system, that they are fond of and would like to retain in their community. Characteristics that the TPAG mentioned included:

- the historic aspect of the town
- sidewalks
- Scenic roads
- Apex's small-town feel

In addition to the visioning exercise, the TPAG also created a list of favorite roads in Apex, which included:

- Olive Chapel Road – for its scenery and homey feel
- Salem Street – for the homey feel, the pedestrian friendliness, and the feeling of history
- Apex Barbecue Road and the Scotts Mill subdivision



Citizens participate in a workshop to shape the Apex Transportation Plan.



Olive Chapel Road was a favorite road for its scenery and homey feel.

- Cooke Street
- Old US 1 – for its rolling hills and historic atmosphere
- Apex Peakway – for the future traffic benefits
- Old Raleigh Road
- Waterford Green Drive – for the median and sidewalks
- US 1 South of Highway 64
- Green Level Church Road
- Olive Street and the downtown grid system

The public involvement process was not limited to members of the TPAG. A public workshop was held on May 8, 2002, to allow members of the community to express their transportation concerns and list their priorities. The top priorities that came from that meeting were:

- Bicycle and pedestrian
  - connectivity of sidewalks and greenways
  - lack of adequate facilities
- Congestion/access management
  - need for turn lanes and intersection improvements
  - concern with commuter traffic passing through town
- Local connectivity
  - too many cul-de-sacs
  - need for grid pattern of roads
  - concern over cut-through traffic
- Transit
  - lack of bus, rail, carpool services
  - meet the needs of elderly or disabled
- Dangerous streets and intersections
- Western Wake Freeway / NC540
  - need for the freeway
  - need for additional access points in Apex
- Apex Peakway
  - use for commuter traffic
  - bypass for NC 55
  - need for 4 lanes



Citizens participate in a planning exercise at the 2006 Apex Transportation Plan update workshop.

As part of the plan update process, a public workshop was held on January 5, 2006, to allow members of the community again to express their transportation concerns and priorities. Staff used this opportunity to “overhaul” the Apex Transportation Plan maps. The workshop was attended by more than 150 participants. Attendees were given the opportunity to view transportation maps and to discuss issues with Town staff, NCDOT staff, environmental experts, and Capital Area MPO staff. Citizens were also given the opportunity to view a slide presentation entitled “Introduction to Transportation Planning” which was developed by Town staff.

A matrix was developed from the questions and comments received during the workshop. Town Planning and Engineering staff met to address each question and comment. The Plan map was updated where possible and both the response matrix and map were posted on the Town website. This Plan Update incorporates the issues raised during this public process.

The Town held another public workshop on January 27, 2011, to gather input from the public. Participants responded to survey questions, made comments on maps, and discussed transportation issues with Town staff. From these discussions and responses Town staff was able to hear the top concerns and priorities held by citizens. The top five transportation funding priorities were:

- Complete the Apex Peakway
- Widen congested roads
- Build sidewalks
- Build greenways
- Provide bicycle facilities

Citizens preferred the sections of the Apex Peakway between Center Street and Old Raleigh Road for its landscaped median and bike lanes. NC 55 between US 1 and US 64 was criticized for its congestion and unattractive design. Other concerns identified at the workshop include roadway congestion, lack of sidewalks, and roadway safety.

In addition to the public meetings to update the plan, staff regularly fields comments from the public regarding transportation needs and opportunities around town. The needs include sidewalk extensions, bike parking locations, and parking opportunities, as well as opportunities to increase future connectivity through additional roadway corridors. The comments are assessed by staff, brought before a public hearing, and considered by the Apex Town Council.

*“Finish Peakway to help alleviate Ten Ten Rd and Salem St congestion.”*

*“Hope you build the proposed greenways sooner rather than later.”*

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Comments received during 2011 workshop



Sidewalk construction along Olive Chapel Road has helped address the lack of adequate pedestrian facilities.

### 1.3 Updates from the Original Plan

Many of the top priorities from original Apex Transportation Plan have been addressed:

- **Bicycle and pedestrian issues — connectivity of sidewalks and greenways; lack of adequate facilities**

- o The Town has constructed over 23,000 linear feet (over 4 miles) of sidewalk since 2002 in order to ensure there is an interconnected network of pedestrian facilities throughout the Town (see Table 1.1 below)
- o Additional sections of planned greenways have been constructed
- o Dozens of bicycle racks have been installed at new residential and commercial developments
- o Future projects are included in the Town's Long Range Capital Improvement Program (CIP)



The intersection upgrade at NC 55 and Salem Street has helped with congestion along NC 55.

- **Congestion/access management — need for turn lanes and intersection improvement; commuter traffic passing through town**

- o Intersection upgrade projects have been completed at the following locations:
  - ◆ Lake Pine Drive/US 64
  - ◆ NC 55/Salem Street
- o Closed-loop signal systems maintained by NCDOT serve NC 55 and the Downtown area with a third system planned for Ten-Ten Road through the US 1 interchange.
- o NCDOT, private developers, and the Town have all provided for numerous upgrades and new installations to improve efficiency and pedestrian safety at intersections throughout Apex



A new bus shelter welcomes riders at the Triangle Transit stop near Lake Pine Drive and US 64.

- **Local connectivity — too many cul-de-sacs; need for grid pattern of roads; cut-through traffic concentrated on a few roads**

- o The Town prohibits cul-de-sacs in new development except where environmental features make through streets unfeasible
- o The Town requires stub streets to be constructed as parts of new residential projects

- **Transit — lack of bus, rail, carpool services; need for services for the elderly**
  - Transit shelters have been added to 2 existing Triangle Transit stops and 2 more have been installed awaiting future bus service
  - Town staff is coordinating with C-Tran to provide future service from Cary to Beaver Creek Commons
- **Dangerous streets and intersections**
  - Pedestrian signals have been installed at multiple intersections
- **Western Wake Freeway / NC540 — need for the freeway; need for additional access points in Apex**
  - Construction of the freeway began in 2009 and is expected to be complete in 2012
  - There are 5 planned interchanges within Apex's jurisdiction
- **Apex Peakway — use for commuter traffic; bypass for NC 55; need for 4 lanes**
  - Since 2002 the Apex Peakway has more than doubled in length to approximately 4 miles of roadway
  - Plans are underway to construct portions of the Peakway to make a continuous route from NC 55 near US 1 clockwise to Center Street, leaving the portion connecting Schieffelin Road with NC 55 as the only remaining unscheduled gap in the loop road
  - A 0.4 mile section of the Peakway from NC 55 through the Broadstone Station development has been constructed to the ultimate 4-lane section

#### *1.4 Other Changes*

Several other important changes have occurred since the original Apex Transportation Plan was adopted:

- Since its adoption in 2002 the Apex Transportation Plan was amended 7 separate times to reflect new information about existing and future development and the planned transportation network.
- The Urban Growth Boundary established in April 2002 was removed February 2005.
- The Town's Extra-Territorial Jurisdiction expanded in 2007 creating the need for additional transportation considerations in the Plan.
- In November 2007 and December 2010 the Town updated its Standard Specifications and Construction Details. Staff modified the roadway typical sections listed in the original Apex Transportation Plan as a result of the update.

### 1.5 Purpose

The purpose of the Apex Transportation Plan is to anticipate and meet the growth demands in and around Apex by providing a resource for creating a complete and efficient transportation network.

### 1.6 Vision

The Town of Apex will be a welcoming community that promotes healthy, sustainable choices in transportation, encourages natural mixes of land uses, embraces its historic and cultural resources, and provides an interconnected network of streets, all while balancing urban functionality with rural charm. In Apex, people of all ages want to live, work, play, shop, visit, and relax. Children will walk to school, families ride bikes to the neighborhood park, and a trip to neighboring towns will be just a short transit ride away.

### 1.7 Authorization

This document, including its accompanying maps and figures, is the official Transportation Plan for the Town of Apex. It is intended to be a complementary resource for other Town documents such as the Unified Development Ordinance, the Apex Comprehensive Plan, and the Parks, Recreation, Greenways, and Open Space Master Plan.

#### *Objectives of the Apex Transportation Plan (as determined by the TPAG)*

1. Create a system of interconnected streets to improve mobility and to distribute traffic efficiently and appropriately by purpose and function
2. Encourage streetscape and “built-in” traffic calming in roadway designs
3. Support “mixed use” development to encourage walking and biking by promoting context-sensitive roadway design
4. Encourage 2-lane and 3-lane roads with street trees and plantings between roadway and development
5. Promote a pedestrian-friendly environment by filling in gaps and improving interconnectivity in the sidewalk system
6. Implement roadway system improvements to accommodate growth and minimize roadway congestion
7. Develop a plan compatible with land use
8. Support more bike lanes and trails to parks and community activity centers
9. Encourage a rail system spurring Triangle Transit’s plans for passenger rail service
10. Support the use of roundabouts as gateway and traffic calming devices in local street design standards
11. Minimize property impacts to existing homes and businesses by promoting context-sensitive roadway design

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**Table 1.1** — Town-funded sidewalk projects since 2002

Location	Length (feet)	Cost
Peakway at Haddon Hall from Hillcrest Drive to N. Chatham	1 610	\$54,000
James Street from Hughes Street to NC 55	642	\$20,110
Peakway at Olive Chapel Road to S. Salem Street	5,650	\$83,000
East Chatham Street from Elm Street to N. Mason Street	573	\$17,280
Lake Pine Drive at US 64	375	\$7,160
S. Salem Street at NC 55	453	\$10,410
Lake Pine Parking Lot from Apex Community Park to Picardy Pointe Subdivision in Cary	470	\$11,810
Saunders Street Parking Lot across from Apex Police Station in front of the parking lot	130	\$2,500
Bus Shelter Installation Project - South Hughes Street at Galaxy Foods	130	\$3,200
Mason Street from Center Street to Town Hall Campus	746	\$10,770
Lynch Street from S. Salem Street to Gumdrop Path	1,212	\$24,410
N. Salem Street to Haddon Hall subdivision entrance	1,490	\$112,580
NC 55 at Olive Chapel Road	915	\$31,760
NC 55 widening - Hunter Street to Haddon Hall from Healthplex Way to Olive Chapel Road	870	\$26,670
Laura Duncan Road from Vineyard Station Shopping Center to Apex High School	2,500	\$143,940
Cameron Park subdivision to Dogwood Ridge subdivision	841	\$72,840
Surrey Meadows - from Rainesview Lane to Satinwood Drive	1,135	\$36,620
Hughes Street - from Olive Street to Moore Street	2,426	\$68,340
Hughes Street - from James Street to Williams Street	1,210	\$45,850
<b>TOTAL</b>	<b>23,378</b>	<b>\$784,240</b>

# Apex Transportation Plan

**Table 1.2** — Town-funded roadway projects since 2002

Roadway Improvements Using Town of Apex Funds Since 2002	Year Completed
Apex Pewy – 2-lane divided from Old Raleigh Rd to Center St	2002
Hunter St – Widen to 3-lane curb and gutter in front of Town Hall	2002
Mason St – Widen to 3-lane curb and gutter from Old Raleigh Rd to Center St	2003
Lynch St – Widen with valley curb (CDBG federal funding with local match)	2004
Perry Rd – Terric Summit to NC 55 (public participation)	2004
Center St/Apex Pewy – New traffic signal	2005
NC 55/Olive Chapel Rd – Crosswalks and signal upgrade	2006
NC 55/Apex Pewy – Crosswalks and signal upgrade	2006
NC 55 Widening to 5-lane – Haddon Hall Dr to Olive Chapel Rd	2007
US 64/Kelly Rd – New traffic signal (temporary until interchange)	2007
Apex Pewy – 2-lane from Hillcrest Rd to N Salem St	2008
James St – Widen to 35' curb and gutter roadway from Hughes St to NC 55	2008
Harwood St – Widen with valley curb (CDBG federal funding with local match)	2008
NC 55/Salem St – Crosswalks, turn lane improvements and signal upgrade	2008
Old Raleigh Rd/Lake Pine Dr & US 64/Lake Pine Dr – Turn lane improvements and signal upgrade	2008
Apex Pewy – 2-lane from S Salem St to Olive Chapel Rd and traffic signal at Olive Chapel Rd	2008
Chatham St – Widen to 35' curb and gutter roadway from Mason St to Elm St	2008
Evans Rd – 2-lane with valley curb extension to Apex Barbecue Rd	2009
Apex Pewy – 2-lane from Anterbury Dr to Tingen Rd (public participation)	2009
NC 55 at PSS #4 – Emergency response traffic signal	2009
Center St/Salem St – New traffic signal (ARRA federal construction funds)	2010
NC 55/Hughes St (north) – Crosswalk across NC 55 added to traffic signal (NCDOT provided signal design and components)	2010
West St – Widen with valley curb (CDBG federal funding with local match)	2010
Apex Pewy – 2-lane from N Salem St to Laura Duncan Rd	2011 (est)
Apex Pewy – 2-lane from Laura Duncan Rd to New Dover Rd	2011 (est)

## Apex Fact Sheet

Motto: The Peak of Good Living  
Population: 37,886 (2010 Census)  
5-year Average Growth Rate: 3.32%  
Corporate Area: 15.47 square miles  
ETJ: 19.17 square miles

Median Household Income (3-mile radius of Hunter/Salem Intersection):  
\$109,348  
Average Sale Price of Residential Property: \$249,274

### 2010 Census

Wake County Population: 900,993  
Raleigh MSA Population: 1,125,827  
North Carolina Population: 9,535,483

2010-2011 Tax Base: 77% Residential  
23% Commercial

### Tax Rates

Apex: 0.340/\$100.00  
Wake County: 0.534/\$100.00

*(Data from Town of Apex Development Report, Apex Chamber of Commerce, and Wake County Tax Assessor)*

<b>Apex Tax Distribution</b>	
Public Safety	33.988 %
Recreation	13.523 %
Public Works	12.500 %
Solid Waste	11.425 %
Administration	8.089 %
Construction Management	6.946 %
Information Systems	6.048 %
Community Development	4.586 %
Public Buildings	2.895 %

# Apex Transportation Plan

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## 2.0 Existing Conditions

### 2.1 Area

The corporate limits of Apex encompass an area of roughly 9,800 acres, over 15 square miles. Apex corporate limits have grown from 10.6 square miles in 2000, averaging an expansion in area of almost 5 percent each year during this period.

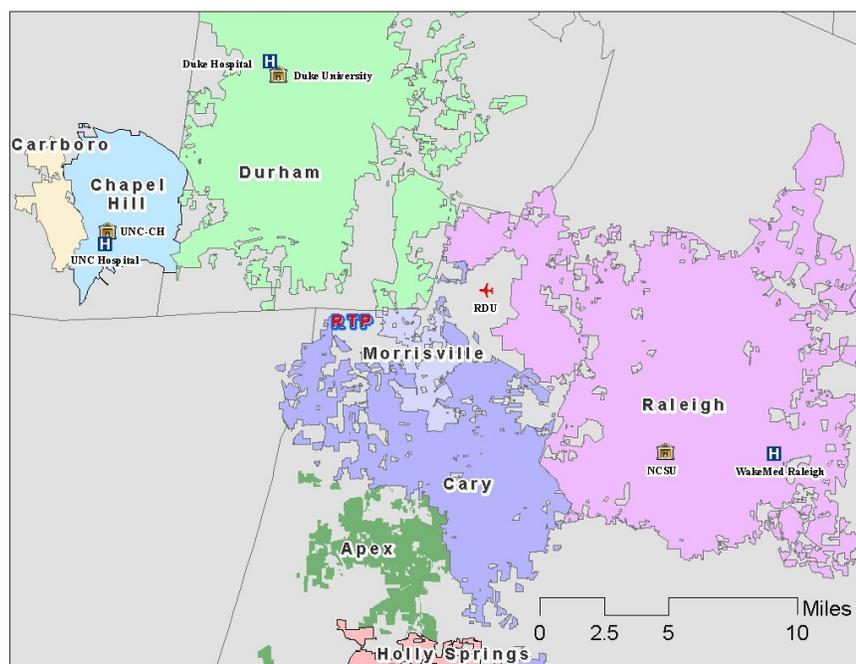
The Extraterritorial Jurisdiction (ETJ) represents the area that can be expected to be provided with services by the Town in the future. In 2007, the Town of Apex expanded its ETJ from an area of approximately 3,860 acres to 13,510 acres. The ETJ expansion has allowed the Town to help shape some of the development trends immediately outside of Town limits by ensuring that new construction projects adhere to the Apex Unified Development Ordinance and the Apex Transportation Plan.

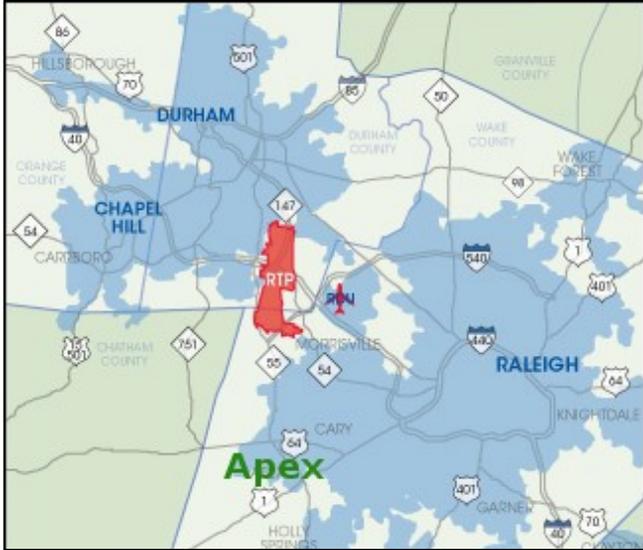
### 2.2 Major Activity Centers

The Town of Apex itself has no major regional activity centers; however, it is impacted by its proximity to several such areas in the Triangle (see **Figure 2.1** below).

**FIGURE 2.1** — Regional Context

*Apex is within 20 miles of many major communities and destinations.*





Apex is in close proximity to several major regional centers.

Source: <http://www.rtp.org/>

Major activity centers in the Triangle include:

- **Research Triangle Park** – a major employment center with more than 170 companies and over 42,000 full-time jobs, located approximately 15 miles from Apex
- **Raleigh** – the capital of North Carolina, home to 6 colleges and universities, with a population of 360,000, located approximately 15 miles from Apex
- **Durham** – a city of almost 250,000, home to 4 colleges and universities, located 20 miles from Apex

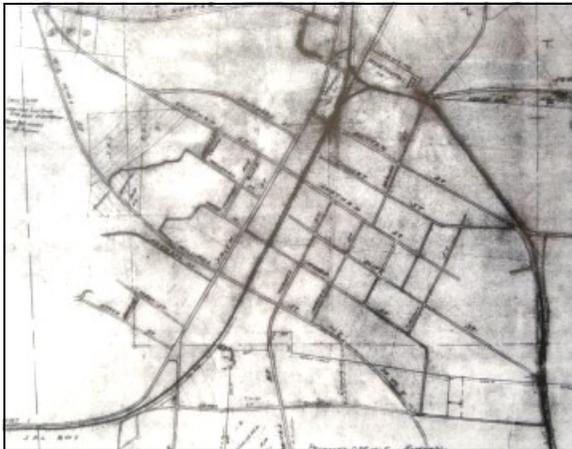
These activity centers directly impact regional commuting patterns. Within Apex, the large numbers of vehicles

traveling along the three major automobile corridors (US 64, US 1, and NC 55) during the morning and evening commute hours confirms the impact of these activity centers on the region as a whole.

### 2.3 Population

Apex is a quickly growing community of approximately 38,000 people, an 85 percent increase over the 2000 Census population (20,212 people). Current predictions estimate that the town population will reach 43,000 by 2015.

**Figures 2.2 through 2.4** show this historical growth rates and population estimates for the Town of Apex.

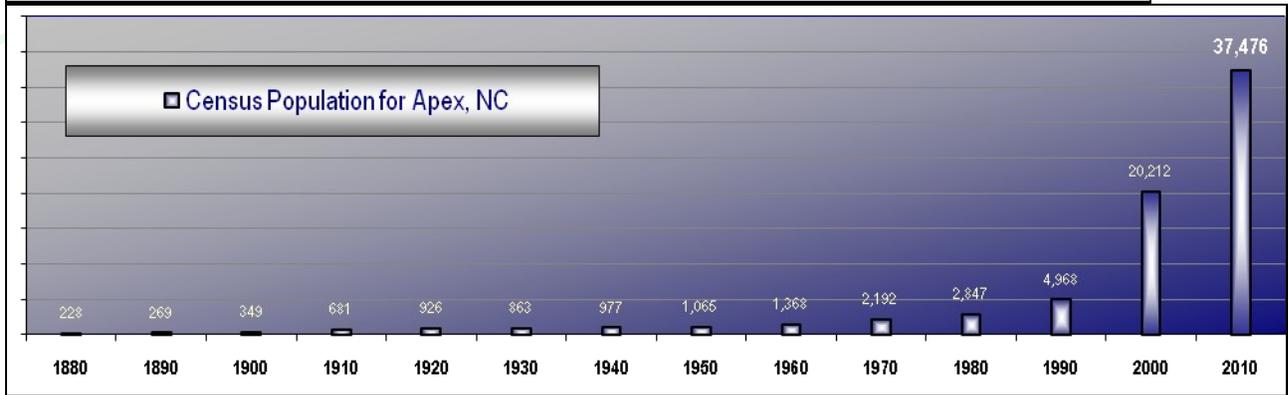


This road map of Apex was taken from an aerial photo in 1928.

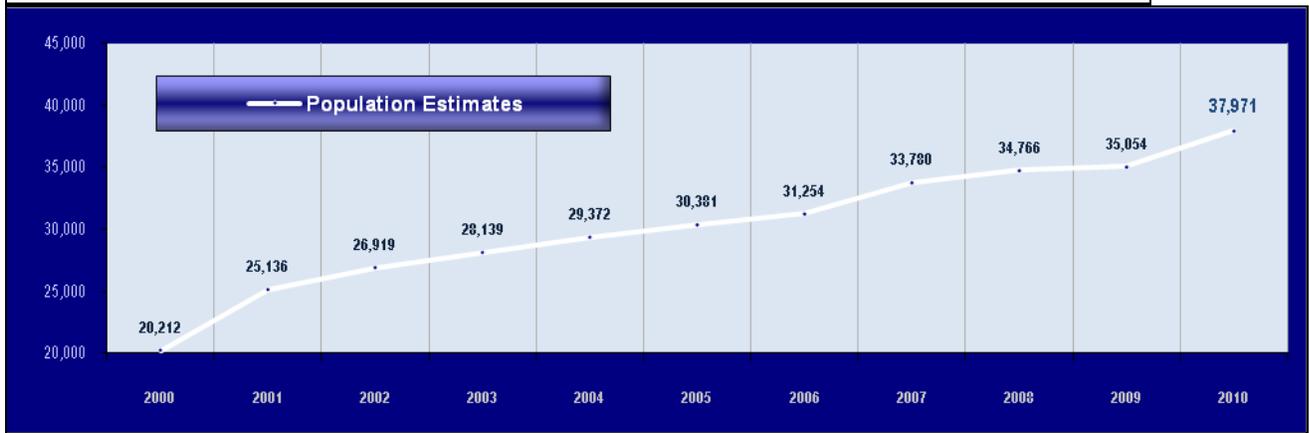
### 2.4 Employment

Employment in and around Apex has remained robust throughout the past decade despite downturns in other regional economies. The greater-Raleigh area (including Apex) has over 500,000 non-farm jobs with 250,000 non-farm jobs in neighboring employment centers. The number of jobs in these areas has increased over 25% past decade.

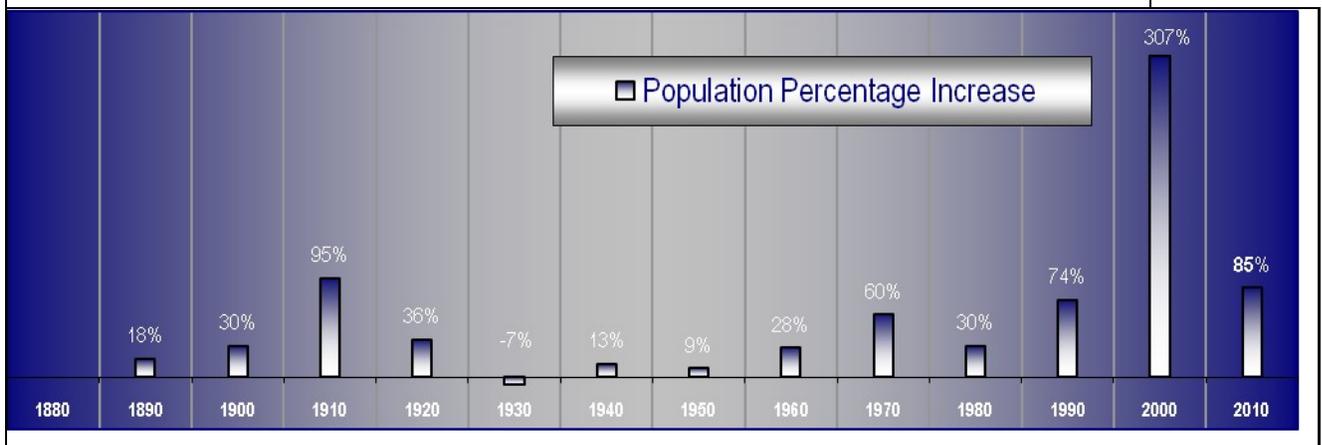
**Figure 2.2 -- Census Population, 1880 - 2000**



**Figure 2.3 -- Apex 10-year Population Estimates**



**Figure 2.4 -- Apex Population Growth Rates by Census Year, 1880 - 2000**



Unemployment for Raleigh has remained well below the national average for the last 10 years. The unemployment rate for the Raleigh area has been on average 25% lower than the national average since 1998.

Apex itself is predominantly residential with less than 10,000 jobs located within the corporate limits. The largest employers within the town are listed below:



Hare Pipeline Construction is a major employer in Apex.

**Apex Top 10 Employers**

- Wake County Public Schools
- EMC Corporation
- Apex Tool Group
- SuperTarget
- Impact Athletics
- Hare Pipeline Construction, Inc.
- Home Depot
- Lowe's Home Improvement
- Bland Landscaping
- Walmart

*Source: Apex Chamber of Commerce*

## 2.5 Existing Transportation Conditions

### 2.5.1 The Town by Foot

Apex generally has an interconnected network of sidewalks that are in good condition and provide an alternative to driving. However, in some areas sidewalks are sporadic or nonexistent. The Town has funded several sidewalk construction projects and has requirements for developers to construct sidewalks on both sides of thoroughfares and collector streets as well as on one side of all residential streets. At present there are nearly 500,000 linear feet of sidewalk in Apex.

In addition to sidewalks, Apex also has several greenways that provide walking opportunities, and the Town has already taken steps toward establishing an interconnected greenway system in the Town of Apex Parks, Recreation, Greenways, and Open Space Master Plan, illustrated in **Figure 2.5**. A section of the American Tobacco Trail, a 30-mile rails-to-trails project in the Triangle, passes through the study area west of the Town of Apex. There are 4 trailheads along the American Tobacco trail that wind through western Apex. The existing sidewalks and greenways in the Town of Apex are illustrated in **Figure 2.6**.

There are few existing grade-separated facilities within Apex corporate limits that specifically serve pedestrians. The multi-use path along the Creekside Landing Drive bridge over US 64 is the only grade-separated facility that accommodates pedestrians and bicycles in the corporate limits. The tunnel allowing the American Tobacco Trail to pass under US 64 is the only grade-separated pedestrian and bicycle crossing in the ETJ.

### 2.5.2 The Town on Bike

Local bicycle facilities in Apex are currently limited in scale. To date there are less than 1.5 miles of bicycle lanes and wide outside lanes combined in the town. The Apex Parkway between Center Street and New Dover Road has striped bike lanes in both directions, while Hunter Street between NC 55 and Salem Street has wide lanes that accommodate bicyclists. The existing bicycle facilities are shown in **Figure 2.7**.



The American Tobacco Trail is a major regional pedestrian facility.



A bicyclist rides along Hunter Street near the Apex Town Hall.

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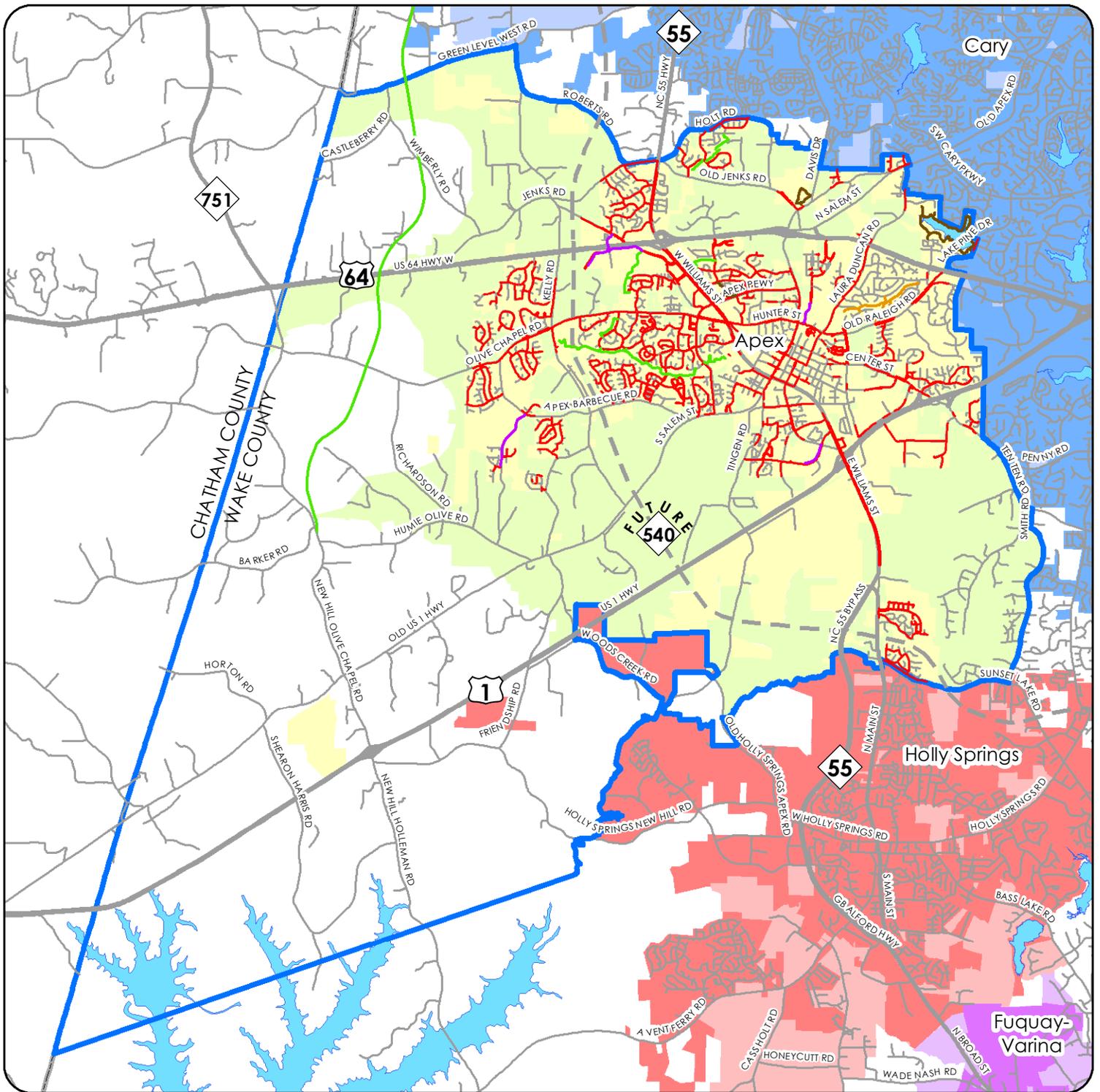


Figure 2.6  
Existing Pedestrian  
Facilities



0 0.5 1 2  
Miles

- Greenway
- Private Greenway
- Trail
- Multi-Use Path
- Sidewalk
- Street
- Study Area
- County Line
- Lake
- Corporate Limits
- Extraterritorial Jurisdiction

# *Apex Transportation Plan*

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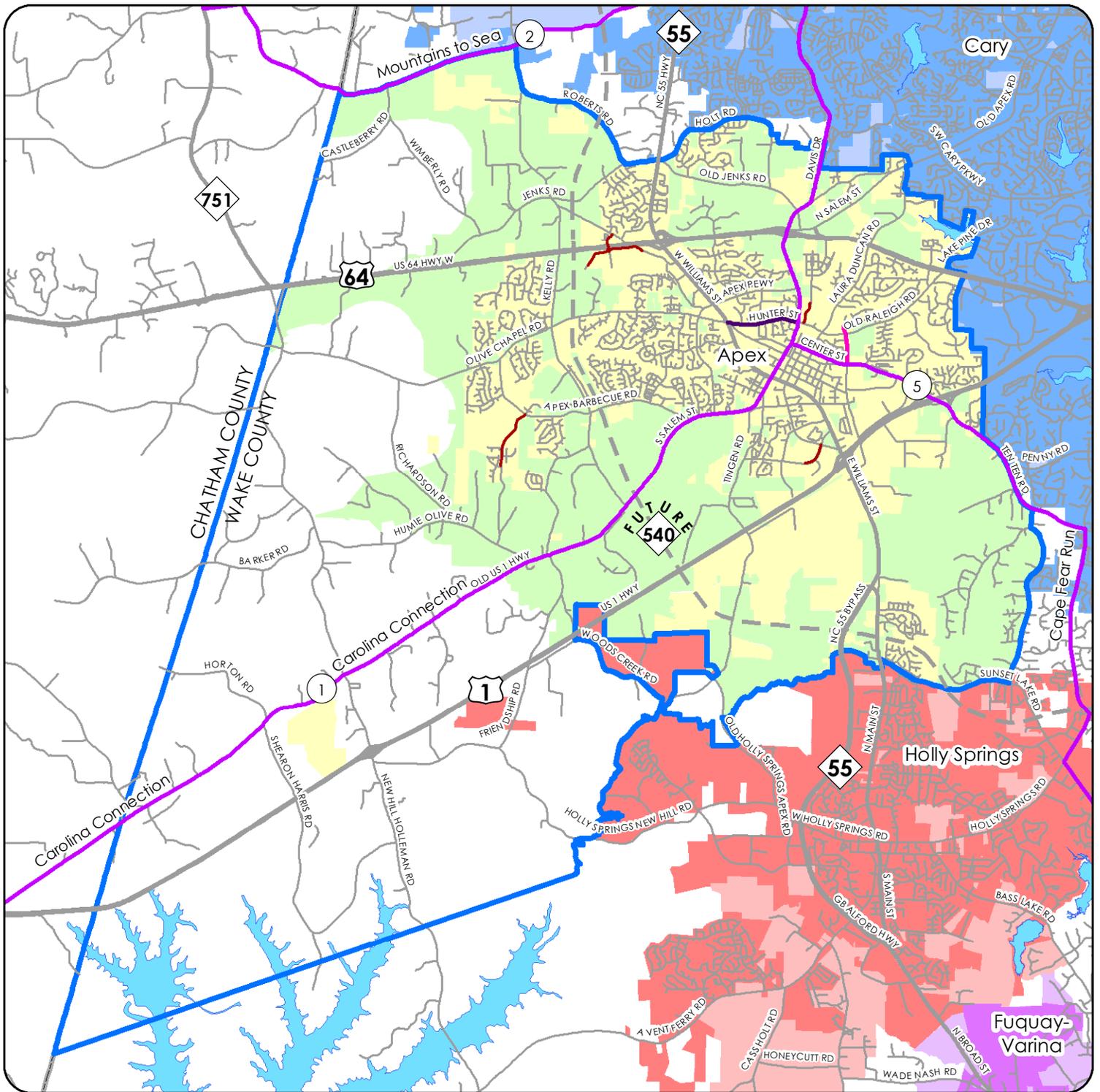
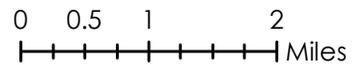


Figure 2.7  
Existing Bicycle  
Facilities



- Bicycle Highway
- Bicycle Lanes
- Wide Outside Lanes
- Multi-Use Path
- Street
- Study Area
- County Line
- Lake
- Corporate Limits
- Extraterritorial Jurisdiction

# Apex Transportation Plan

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Because bicycles are considered vehicles, designated bicycle facilities are not necessary on every street. Some beginner cyclists prefer off-road facilities such as greenways and multi-use paths while some advanced cyclists prefer not to be constrained to a bicycle lane.

### **Regional Bicycle Routes**

The North Carolina Department of Transportation (NCDOT) has designated a system of bicycling highways that serve as long distance travel and recreation routes for cyclists traveling throughout the state. While some of the designated bicycling highways are simply spurs that run through several counties before terminating at another bicycling highway, others are continuous north/south and east/west routes. Three of the State's designated bicycling highways pass through or begin in Apex:

- Carolina Connection
- Mountains to Sea Route
- Cape Fear Run

#### *--Carolina Connection (US Bike Route 1)*

The Carolina Connection is a north/south route that runs over 200 miles from Virginia to South Carolina through the eastern Piedmont and southwestern Sandhills regions of the state. This route is an important part of the national system of bicycling highways and is designated as US Bike Route 1, which runs continuously from Maine to Florida along the eastern seaboard. The route runs through the center of Apex along Davis Drive, Salem Street, and Old US 1 Highway.

#### *--Mountains to Sea (NC Bike Route 2)*

The Mountains to Sea is a route that runs from Murphy in the North Carolina mountains to Manteo on the Carolina coast. The route is over 700 miles long and passes through the mountains, the piedmont, and the coastal plain on its journey from west to east. It runs along Green Level West Road on the northern border of the study area.

#### *--Cape Fear Run (NC Bike Route 5)*

The Cape Fear Run is a 160-mile route that approximately parallels the Cape Fear River and Interstate 40 on its journey from Wake County to New Hanover County on the Carolina coast. It begins in Apex, at the intersection of Center Street and Salem Street, where it joins the Carolina Connection. It continues out of town to the east along Center Street and Ten Ten Road.



Signs for US Bike Route 1 and NC Bike Route 5 welcome bicyclists on Salem Street.

### 2.5.3 The Town by Car

#### **Regional Automobile Routes**

Apex is currently served by three major regional automobile transportation routes:

- NC 55
- US 1
- US 64

#### *NC 55 (Williams Street)*

NC 55 is a North Carolina west-east highway running from Durham in the center of the state to Oriental on the coast. Within Apex, NC 55 (or Williams Street) provides a major northwest to southeast corridor ranging from a 2-lane rural section immediately west of Salem Street to a 5-lane suburban roadway section with curb, gutter, and sidewalk on both the west and east sides of Apex through the intersections of US 64 and US 1.

Williams Street provides access to both US 64 and to US 1 at diamond interchanges and connects Apex with the Research Triangle Park, Morrisville, and Cary to the north and Holly Springs and Fuquay-Varina to the south. As a result of its location, NC 55 acts as a commuting corridor between communities north and south of Apex.

#### *US 1*

US 1 is a major south-north highway linking North Carolina to Florida and Maine. The highway is located to the east and south of Apex connecting Sanford and other communities to the southwest with Raleigh to the northeast. US 1 through Apex is a 4-lane divided, access-controlled highway.

#### *US 64*

US 64 is a major west-east highway that runs within North Carolina from Murphy to Manteo, sitting to the north of downtown Apex. The local section of the US 64 corridor is a 4-lane median divided highway with partial access control, connecting Chatham County to the west with the Capital area to the east.



The iconic CSX railroad bridge crosses over NC 55 in Apex.



Cars travel east along US 64 near Laura Duncan Road.

### Local Automobile Routes

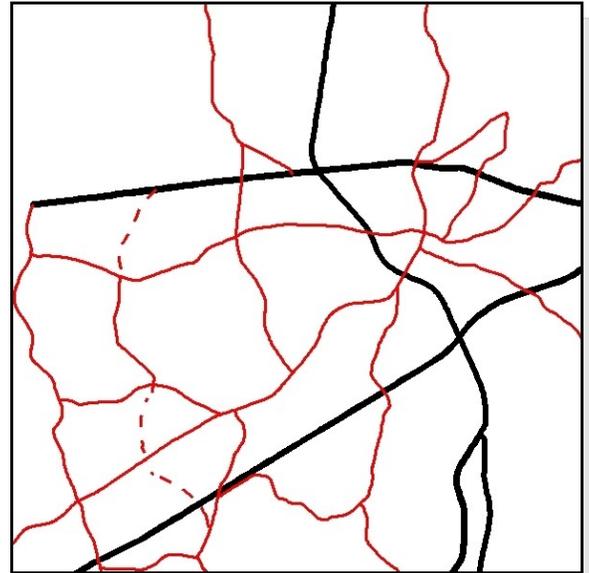
Apex's roadway network is based on a street hierarchy with four classes of streets:

- highway
- thoroughfare
- collector
- local street

In turn, each classification (with the exception of highways) is broken down into major and minor subsections (major collector and minor collector).

#### Major Thoroughfares

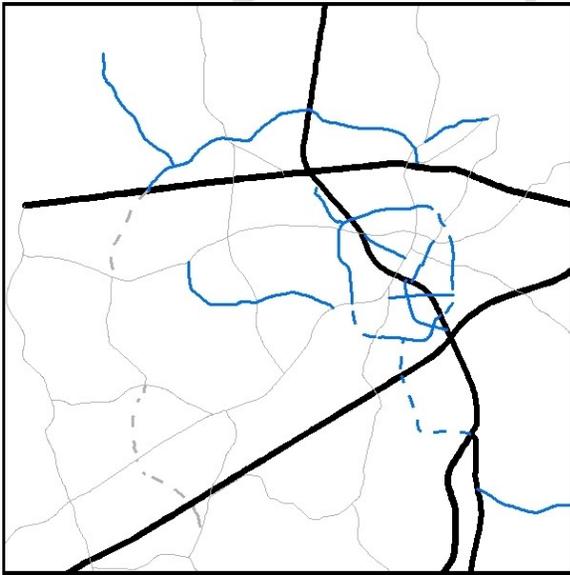
Major thoroughfares in Apex include the web of streets that serve medium- to long-distance travel and connect minor thoroughfares and collector streets to freeways and other higher-level roadway facilities, as shown in the figure to the right. Thoroughfares provide the highest degree of automobile mobility with less accessibility for pedestrians and bicyclists. For the most part, roadway improvements and maintenance on major thoroughfares are funded by the State. Roads that are currently designated as major thoroughfares in Apex include:



Major thoroughfares provide connections between high order roadways.

- Davis Drive
- Green Level Church Road
- Humie Olive Road/ Richardson Road/ Friendship Road
- Hunter Street/Old Raleigh Road/Lake Pine Drive
- Kelly Road
- Laura Duncan Road
- NC 55/Williams Street
- New Hill Olive Chapel Road/New Hill Holleman Road
- North Salem Street
- Old Holly Springs Apex Road/ Tingen Road
- Old US 1 Highway/ South Salem Street
- Olive Chapel Road
- Richardson Road
- Sunset Lake Road
- Ten Ten Road/ Center Street

As one might expect, some of these roads are often travel routes to neighboring communities, such as Davis Drive to Cary.



Minor thoroughfares provide connections between other thoroughfares.

### Minor Thoroughfares

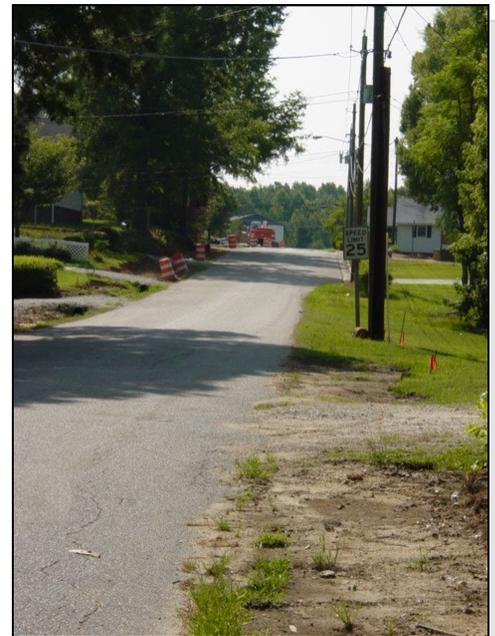
For the most part minor thoroughfares are maintained by the State, but the cost of improvement is typically the responsibility of local governments. These roads primarily serve a local travel purpose and often connect to other minor thoroughfares and to major thoroughfares, as shown on the left. In Apex, minor thoroughfares are mostly two-lane undivided roads with little or no paved shoulders and the occasional left-turn lane at major intersections and driveways. Posted speed limits on minor thoroughfares range from 25 mph to 45 mph. Other characteristics may include sidewalks, signalized intersections, and on-street parking (in residential areas and on downtown streets). Minor thoroughfares in Apex include:

- Apex Barbecue Road
- Apex Peakway
- Holly Springs New Hill Road
- James Street
- Jenks Road/Old Jenks Road
- Mason Street
- Old Raleigh Road
- Old Smithfield Road
- Salem Church Road
- Smith Road
- South Hughes Street
- Stephenson Road
- West Chatham Street
- Wimberly Road
- Woods Creek Road
- Zeno Road

### Collector Streets

The main purpose of the collector street system is to “collect” traffic from neighborhoods and distribute it throughout the Town either through the system of collector streets or to major or minor thoroughfares. In general, collector streets have two lanes and frequently have exclusive left-turn lanes at busy intersections. In general, collector streets are not part of the State-maintained system of roads. Collector streets in Apex have a wide range of physical characteristics, some of which are attributable to the neighborhoods in which they exist.

There are two designations for collector streets in Apex: Major Collector and Minor Collector. Ma-



Construction along Lynch Street helps improve it to collector street standards.

Major collectors are wide local streets with 30 feet of paved lanes and speeds ranging from 25 to 35 mph. Minor collectors are local streets with only 22 feet of paved lanes. Both classifications of collector streets function to promote free traffic flow, therefore curb parking is discouraged. Sidewalks are constructed on both sides of all collector streets. Major collectors prohibit direct access by residential driveways. Existing collector streets in Apex include the following (major collectors shown in bold):

- Barker Road
- Blackburn Road
- Bobbitt Road
- Burma Drive (extension)
- Cabin Cove Road
- **Chanticleir Drive**
- Chapel Ridge Road
- Classic Road
- Creekside Landing Drive
- Derry Down Lane
- Dinsorette Lane
- **Energy Drive**
- Evans Road
- Farm Pond Road
- Haddon Hall Drive
- Hickory Mountain Road
- Holt Road
- Howell Road
- Investment Boulevard
- Lufkin Road
- Lynch Street
- Marco Drive
- **Milano Avenue**
- **Mt. Zion Church Road**
- N. Tunstall Avenue
- Old London Way
- Old Mill Village Drive
- **Perry Road**
- Pine Plaza Drive
- Pleasant Plains Road
- Production Drive
- Reliance Avenue
- **Reunion Creek Parkway**
- Rothwood Way
- Schieffelin Road
- Straywhite Avenue
- Technology Drive
- **Thriftwood Drive**
- Windy Road
- Woodfield Dead End Road

#### Local Streets

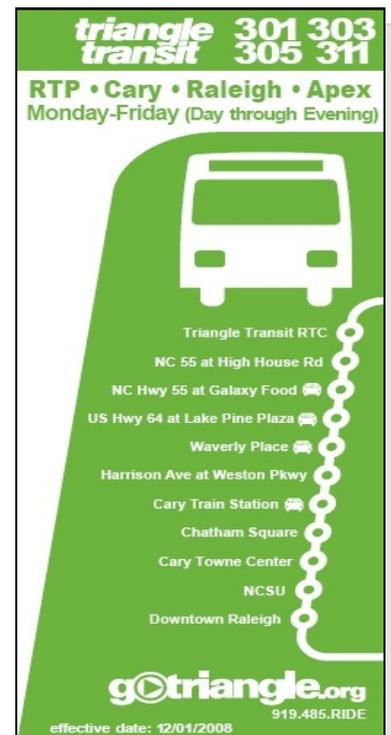
All streets not designated as highways, thoroughfares, or collectors, are considered local streets. These streets are designed to carry low volumes of traffic at low speeds and serve primarily residential uses. Examples of local streets include Saunders Street downtown and Abby Knoll Drive in the Haddon Hall neighborhood.

#### 2.5.4 The Town by Transit

At present, Apex is served by two transit providers: Triangle Transit and Wake Coordinated Transportation Service (WCTS), with Cary's transit service (C-Tran) located nearby as well.

#### --Triangle Transit

Triangle Transit is a regional transit service provider for Orange, Durham, and Wake counties. Two of Triangle Transit's bus routes operate in Apex. Route 311 stops at Galaxy Food on NC 55 and at Lake Pine Plaza and provides service to Research Triangle Park. Route 305 stops at Lake Pine Plaza and provides service to Cary, downtown Raleigh, and Research Triangle Park. Both routes operate approximately every 30 minutes during the morning and evening



Triangle Transit routes serve 2 locations in Apex: Galaxy Food and Lake Pine Plaza.

peak hours. Triangle Transit also has an organized vanpool service operating during regular work hours on weekdays, and provides a carpool matching service. For a map of the routes, visit [www.triangletransit.org](http://www.triangletransit.org).

--Wake Coordinated Transportation Service (WCTS)

Wake Coordinated Transportation Service (WCTS) operates the Transportation and Rural Access or TRACS program. TRACS is general public transportation providing service to the residents of the non-urbanized areas of Wake County with on-demand transit service. People wishing to use TRACS must schedule the service by calling the WCTS hotline at 919-212-7005.

--Cary Transit (C-Tran)

The Town of Cary operates its own bus service called Cary Transit (C-Tran). C-Tran operates both fixed-route and on-demand service to Cary residents. Currently, C-Tran does not provide bus service to Apex; however, C-Tran has proposed a fixed route to serve Beaver Creek Commons in Apex. For more information on C-Tran's service, visit [www.townofcary.org](http://www.townofcary.org).



## 2.6 Current Patterns and Conflicts

### 2.6.1 ADT

Average Daily Traffic (ADT) is an estimate of the total number of motor vehicles on a segment of a roadway during a 24-hour period. As roads are designed to carry a maximum number of vehicles and the vehicle level of service for a road is determined in large part by the number of vehicles traveling on it, ADT is a useful tool for measuring areas in the transportation network that are overloaded or operating close to capacity. Because it is an estimate and because it only refers to automobile traffic, ADT should not be the only factor considered when determining locations for needed improvements. Other considerations such as pedestrian, bicycle, and transit access should be considered along with ADT when determining where investments should be made to the transportation network.

**Figure 2.8** shows ADT values for major road segments within Apex.



ADT counts along NC 55 show high volumes of cars.

Source: [www.ncdot.org/traffictavel/](http://www.ncdot.org/traffictavel/)

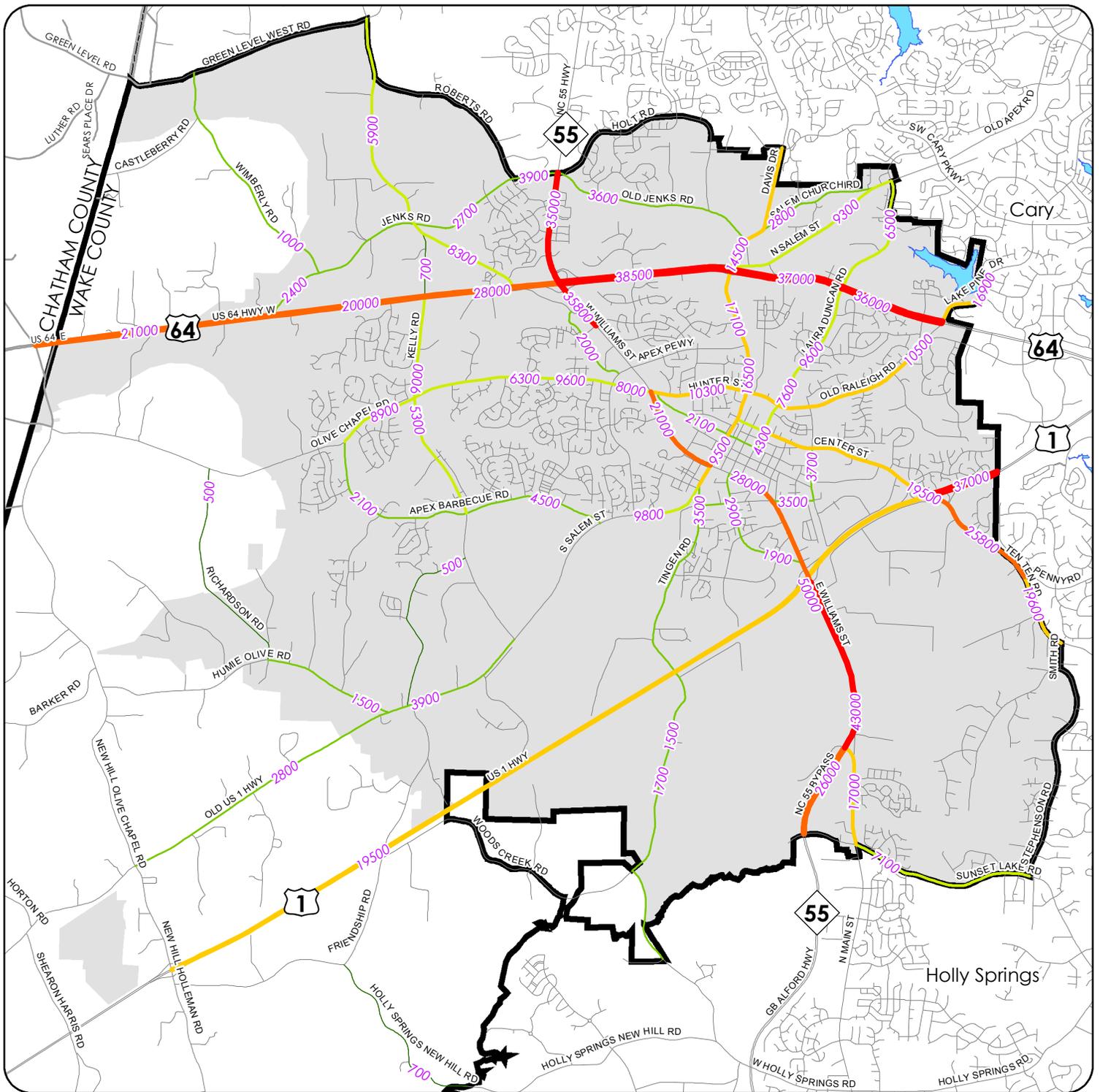
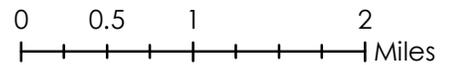


Figure 2.8

# 2010 Average Daily Traffic Volume (Estimated)



- |  |  |
|--|--|
| <p>Volume at NCDOT Existing Data Locations</p> <ul style="list-style-type: none"> <li><span style="color: lightgreen;">—</span> &lt;1000</li> <li><span style="color: green;">—</span> 1000-4999</li> <li><span style="color: yellowgreen;">—</span> 5000-9999</li> <li><span style="color: yellow;">—</span> 10000-19999</li> <li><span style="color: orange;">—</span> 20000-29999</li> <li><span style="color: red;">—</span> ≥30000</li> </ul> | <ul style="list-style-type: none"> <li><span style="border-bottom: 1px solid black; width: 20px; display: inline-block;"></span> Existing Street</li> <li><span style="border: 2px solid black; width: 20px; height: 10px; display: inline-block;"></span> Study Area</li> <li><span style="border: 1px dashed black; width: 20px; height: 10px; display: inline-block;"></span> County Line</li> <li><span style="background-color: lightblue; width: 20px; height: 10px; display: inline-block;"></span> Lake</li> <li><span style="background-color: lightgrey; width: 20px; height: 10px; display: inline-block;"></span> Apex Jurisdiction</li> </ul> |
|--|--|

# *Apex Transportation Plan*

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### 2.6.2 Intersection Crash Data

**Table 2.1** below provides a synopsis of the high accident locations in Apex. The crash data were provided by NCDOT and cover the 7-year period from January 1, 2004, through December 31, 2010. As can be expected the highest number of crashes occur at the intersections with the highest traffic volumes in Apex.

<b>Table 2.1 -- Apex Intersection Crash Data, 2004-2010</b>	
<b>Intersection</b>	<b>Number of Crashes</b>
US 64/NC 55	162
US 1/NC 55	145
US 64/Laura Duncan Road	92
US 64/Lake Pine Drive	74
US 64/Shepherds Vineyard Drive	51
NC 55/Salem Street	50
US 64/Green Level Church Road	49
NC 55/Technology Drive	47
NC 55/Apex Peakway	98*
NC 55/Hughes Street	66**

\* Data do not differentiate between the 2 separate intersections of NC 55 and the Apex Peakway

\*\* Data do not differentiate between the 2 separate intersections of NC 55 and Hughes Street

### 2.6.3 Corridor Crash Data

Like intersection crash data, corridor crash data for Apex were provided by NCDOT and cover the 7-year period from January 1, 2004, through December 31, 2010. The corridors with the highest number of crashes are typically those with the highest volume of vehicles as seen in **Table 2.2**.

**Table 2.2 -- Apex Corridor Crash Data, 2004 - 2010**

<b>Corridor</b>	<b>Fatal Crashes</b>	<b>Injury Crashes</b>	<b>Property Damage Only Crashes</b>	<b>Total Crashes</b>
NC 55/Williams Street	4	553	1,328	1,885
US 64	3	144	328	475
SR 1011 (Salem St/Old US 1)	1	71	185	257
SR 1010 (Ten Ten Rd/Center St)	0	53	148	201
US 1	0	34	109	143
Laura Duncan Rd	0	31	97	128
SR 1160 (Olive Chapel Rd)	0	27	81	108
Lake Pine Dr	1	27	74	102
SR 1435 (Old Raleigh Rd)	0	30	47	77
SR 1161 (Beaver Creek Commons Dr/Zeno Rd)	0	10	74	84

<b>Level of Service</b>	<b>Average Control Delay per Vehicle (s/veh)</b>
A	≤ 10
B	> 10 — 20
C	> 20 — 35
D	> 35 — 55
E	> 55 — 80
F	> 80

**2.6.4 Intersection Level of Service**

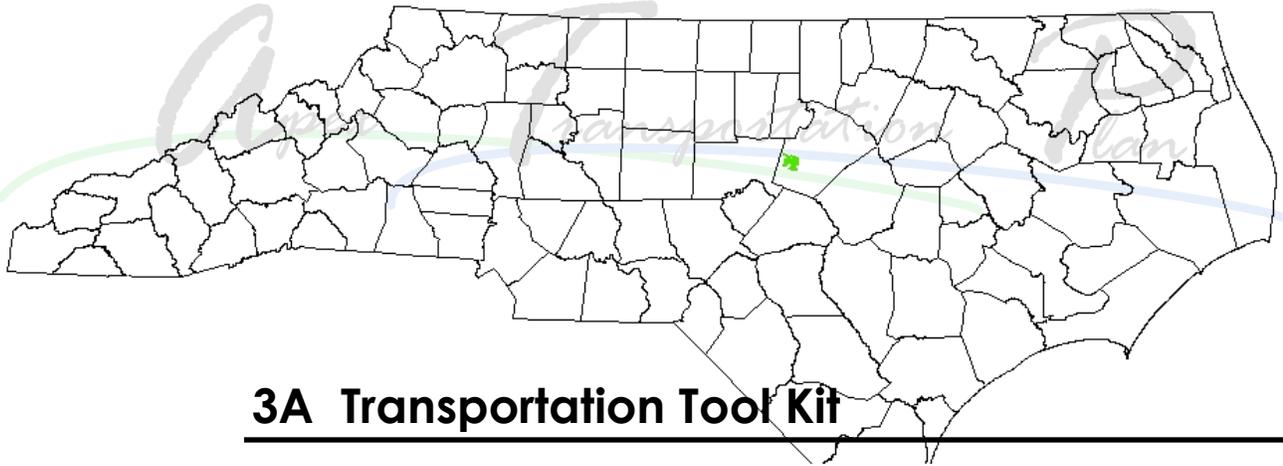
Level of Service (LOS) is a rating system that analyzes the operating conditions for motorists at intersections. LOS is rated on a scale from A to F, where LOS A represents good service with little or no delay and LOS F denotes a failing intersection. Apex intersections operating at LOS D or better are considered acceptable from a motorist's perspective. Because intersection traffic counts and analyses are generally conducted only when major development occurs in the immediate vicinity, the years of analysis of different intersections' LOS vary. The LOS ratings for several major intersections in Apex and their analysis years are provided in **Table 2.3**.

**Table 2.3 -- Apex Intersection Vehicle Level of Service**

<b>Intersection</b>	<b>AM Peak Hour Level of Service</b>	<b>PM Peak Hour Level of Service</b>	<b>Year of Analysis</b>
NC 55/Olive Chapel Rd	E	D	2004
NC 55/Salem St	C	E	2006
NC 55/Apex Peakway (North)	D	B	2006
NC 55/Apex Peakway (South)	B	B	2006
NC 55/Beaver Creek Crossing	n/a	D	2008
NC 55/Hughes St (South)	C	C	2006
Kelly Rd/Olive Chapel Rd	B	C	2009
Kelly Rd/US 64	C	D	2009
Center St/US 1	C	D	2005
Olive Chapel Rd/ Apex Peakway	C	D	2009

# Apex Transportation Plan

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## 3A Transportation Tool Kit

### 3A.1 Walkability/Bikeability Audits

Walking and biking audits can be useful tools for evaluating existing conditions within an area and can help identify gaps in the current transportation network. These checklists ask questions such as “Was it easy to cross streets?” or “How was the surface that you rode on?” that allow the auditor to look for all factors that make a place walkable or bikable.

For a good walkability audit, visit:

<http://www.walkinginfo.org/library/details.cfm?id=12>

For a good bikability audit, visit:

<http://www.bicyclinginfo.org/pdf/bikabilitychecklist.pdf>



### 3A.2 Pedestrian Facilities

#### 3A.2.1 Sidewalks

Sidewalks in Apex are typically 5-feet wide and constructed of concrete. In areas where high levels of pedestrian activity are anticipated, wider sidewalks should be considered. Sidewalks are required on one side of all new residential streets and both sides of all new collector and thoroughfare streets. Capital projects are underway to add sidewalks to existing streets that lack them. **Table 5.1** provides a list of capital improvement projects to be completed in the future. Existing and future sidewalks in Apex are shown on the Bicycle, Pedestrian, and Equestrian Plan map in **Appendix A**.



Sidewalks provide a comfortable place for people to walk and socialize.

#### 3A.2.2 Verges

Adequate verge (the grass strip between the curb and sidewalk) widths are important in creating a desirable pedestrian space at the roadside. The minimum preferred width for verges is 5 feet.

A verge is essential because it provides spaces for grass, utilities, fire hydrants, newspaper boxes, mailboxes, and numerous other necessary amenities that otherwise block and effectively narrow a sidewalk. Along roads with high volumes of motor vehicle traffic, a wider verge is preferable to create a more comfortable distance between the sidewalk and the roadway.



The grass verge along Tingen Road provides ample separation between the sidewalk and the road.

Specific verge widths for the different roadway types are shown on the roadway typical sections in **Section 3C**.

### 3A.2.3 Greenways

Greenways are paths designed for multiple nonmotorized users through open space. Essentially, greenways are natural, linear parks that provide a path for pedestrians and cyclists to travel both to a destination or for recreation. According to the Town of Apex Parks, Recreation, Greenways, and Open Space Master Plan, adopted in 2001, greenways in Apex have a minimum path width of 10 feet and an ideal path width of 12 feet. Greenways paths are typically constructed of asphalt, concrete, or wood (for boardwalk designs).

travel both to a destination or for recreation. According to the Town of Apex Parks, Recreation, Greenways, and Open Space Master Plan, adopted in 2001, greenways in Apex have a minimum path width of 10 feet and an ideal path width of 12 feet. Greenways paths are typically constructed of asphalt, concrete, or wood (for boardwalk designs).



Greenways provide a place for pedestrians completely removed from motor-vehicle traffic.

### 3A.2.4 Multi-use paths

Similar to greenways, multi-use paths provide transportation and recreation access for nonmotorized users along a 10-foot-wide paved path. Unlike greenways, multi-use paths are located within the public right-of-way and adjacent to the roadway. Multi-use paths act as wide sidewalks while also providing room for bicyclists.

### 3A.2.5 Grade-separated crossings

While pedestrians are an important aspect of a healthy urban environment and are a welcome user of the street network, not all roadways are safe for (or accessible to) pedestrians. These facilities include freeways, highways, and roadways with many wide lanes. Grade-separated crossings of these unwelcoming facilities, such as pedestrian bridges and underpasses, are useful tools for maintaining pedestrian mobility despite these suburban barriers.



A tunnel under US 64 allows users of the American Tobacco Trail access across the highway.

### 3A.3 Bicycle Facilities

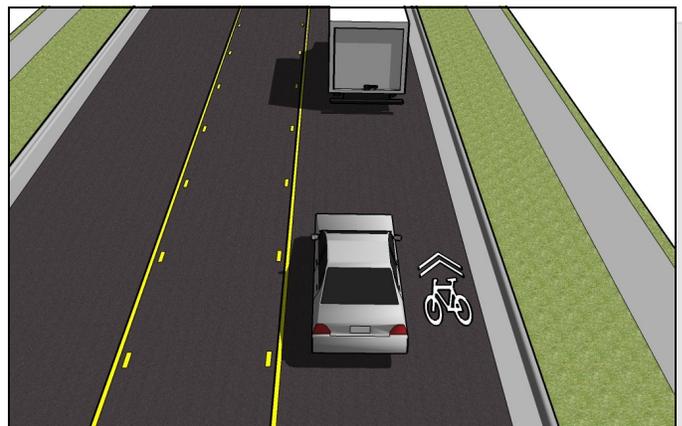
#### 3A.3.1 Bicycle lanes

The American Association of State Highway Transportation Officials (AASHTO) notes that bicycle lanes can help provide roadway space for the preferential use by bicyclists. By creating extra space for bicyclists, these lanes help produce more predictable movements by both cyclists and motor vehicles, allowing for potentially safer interaction between the two groups.

According to the 1999 AASHTO report, "Guide for the Development of Bicycle Facilities," bike lanes should be delineated from other travel lanes with a 6-inch solid white line. Bike lanes should be a minimum of 5 feet in width, as measured from the face of curb to this line. On rural roads without curb and gutter, bike lanes should be a minimum of 4 feet in width.

#### 3A.3.2 Shared roadway markings

Where bike lanes are not feasible, shared roadway markings, or "sharrows," can be used to demarcate a travel lane as a lane shared by multiple users. Sharrows are currently considered experimental by the National Committee on Uniform Traffic Control Devices (NCUTCD) but have been recommended for inclusion in the updated Manual on Uniform Traffic Control Devices (MUTCD).



This sketch shows what a sharrow would look like on a typical Apex street.

On roadways where on-street parking is permitted sharrows should be placed a minimum of 11 feet from the

curb. This distance allows bicyclists to remain a safe distance from the parked cars, outside of the door zone. On roadways where on-street parking is prohibited and there is insufficient room for bicycle lanes sharrow markings should be placed 3 feet from the curb.



Wide lanes along Hunter Street provide enough room for both cars and cyclists.

### 3A.3.3 Wide outside lanes

Wide outside lanes are travel lanes that are wider than standard lanes in order to provide additional space between cyclists and motor vehicles. Typically these lanes are 14 feet wide on multilane roadways and 15 feet wide on single-lane roadways.

This facility is most appropriate on travel routes with moderate traffic volumes and is suitable for cyclists who are comfortable riding with the flow of regular traffic. While basic cyclists can ride these

routes, they are most often preferred by advanced cyclists. In order to limit the effective width of motor-vehicle travel lanes, wide outside lanes should be used in conjunction with shared roadway markings.

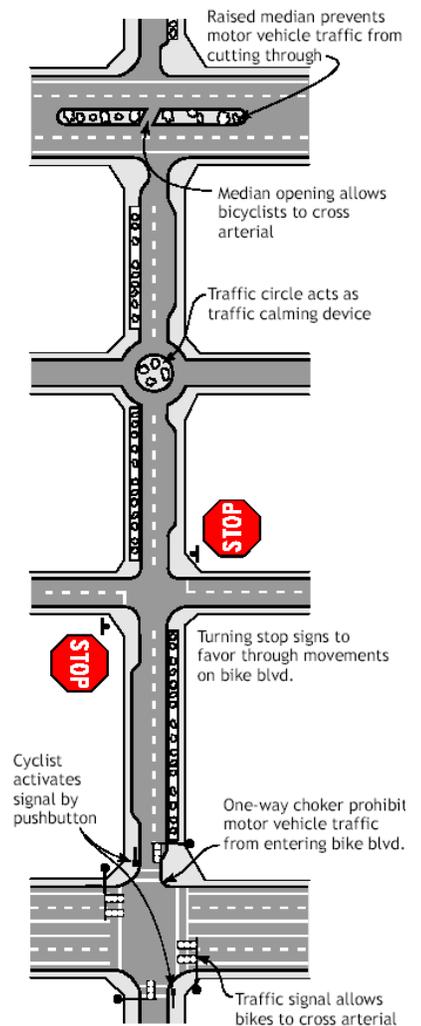
*Wide outside lanes will be included on all proposed and improved thoroughfares as well as all proposed collector streets.*

### 3A.3.4 Signed routes

The North Carolina Department of Transportation has established a cross-state network of signed bicycle routes called "Bicycling Highways." In addition local bicycle traffic can be served on local signed routes that provide wayfinding guidance to citizens and visitors.

### 3.3.5 Bike boulevards

Like signed routes, bike boulevards provide wayfinding for cyclists desiring to ride on a roadway with light motor vehicle traffic. Bike boulevards often use local neighborhood streets with preferential design to bicycles such as limited numbers of stop-controlled intersections, partial roadway diverters, and neighborhood traffic circles.



### 3A.3.6 Off-road facilities

In addition to on-road facilities, off-road facilities can serve bicycle travel needs. Unlike many on-road facilities, these off road paths are often more attractive to younger or less-experienced cyclists. Such facilities include greenways and multi-use paths described previously.



Construction of a boardwalk along Beckett's Crossing Greenway created an off-road connection between Olive Chapel Road and the Beaver Creek Commons shopping center.

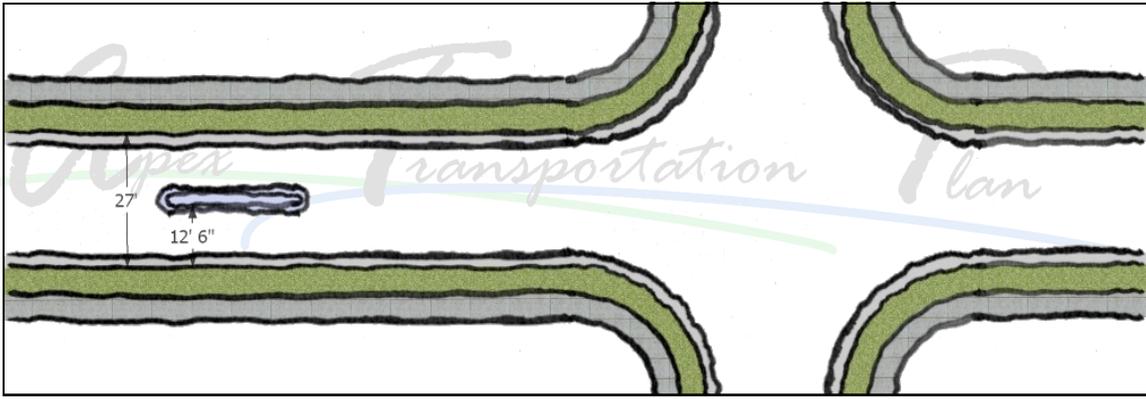
Opposite: A diagram shows treatments along a street to convert it to a bicycle boulevard.

Source: Turner-Fairbank Highway Research Center

(<http://www.tfhrc.gov/safety/pedbike/pubs/05085/chapt14.htm>)

# Apex Transportation Plan

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## **3B Traffic Calming**

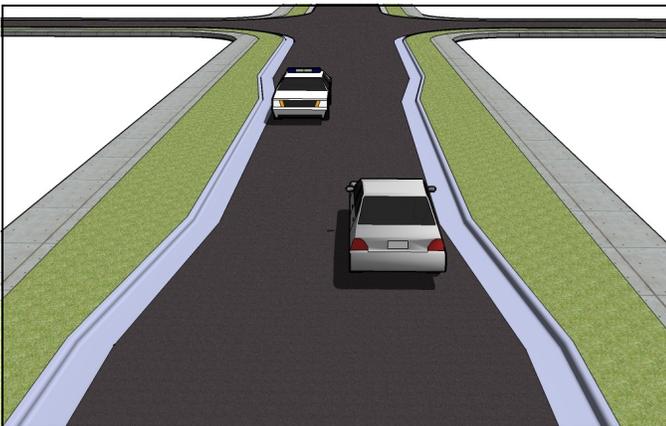
### **3B.1 Roadway Design**

#### **3B.1.1 Narrow lanes**

The street typical sections for Apex include standard lane widths ranging from 11 feet to 15 feet. In areas with a need for traffic calming, lane width can be narrowed to 10 feet in order to slow motor vehicle traffic.

#### **3B.1.2 On-street parking**

Parallel on-street parking can help calm traffic by creating friction for vehicles in the travel lanes adjacent to the parking. Also, as people pull into and out of the spaces, the through traffic must slow down. Along roadways where on-street parking is permitted but not utilized, striping the parking areas may result in a similar reduction in speed.



Neckdowns can encourage motorists to slow down as they decrease the overall roadway width.

#### **3B.1.3 Neckdowns**

Neckdowns provide a narrowing of the roadway for a small section of the road by reducing the distance between the curbs. These treatments can be provided at specific points along a roadway to reduce lane width and slow speeds.

#### **3B.1.4 Median slow points**

Like neckdowns, median slow points narrow the roadway for a small section of the road. Instead of narrowing the road at the curb, a median is installed in the middle of the road to effectively narrow the travel lanes.

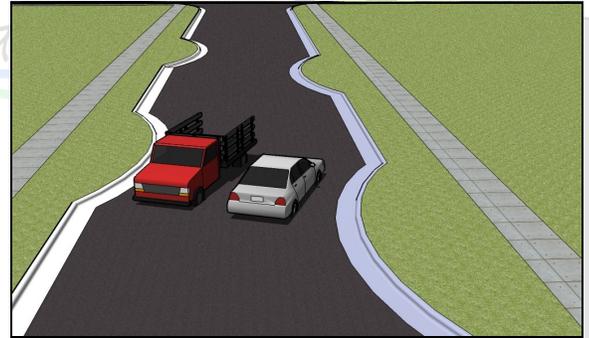
### 3B.2 Horizontal Deflections

#### 3B.2.1 Diverters

For streets that have too much traffic traveling along them, diverters can prohibit vehicles from entering them at certain points. Diverters can be concrete islands or medians that prohibit specific movements at an intersection.

#### 3B.2.2 Chicanes

Chicanes channelize the travel lanes in order to slow traffic. This treatment turns a straight roadway into a serpentine street through a series of back-to-back curves.



Chicanes force vehicles to make small turns in order to travel along a roadway.

### 3B.3 Vertical Deflections

#### 3B.3.1 Speed humps

These treatments are raised areas along the road that are 3 inches high and 14 feet long.

#### 3B.3.2 Raised crosswalks

Like speeds humps, raised crosswalks are raised areas along the road. This treatment, however, provides a 10 foot wide plateau for a crosswalk. Raised crosswalks are 3 inches high and 22 feet long.



A speed hump calms traffic along a residential street in Apex.

### 3B.4 Intersection Treatments

#### 3B.4.1 Roundabouts

These free-flowing intersection treatments force vehicles to slow down when travelling through the intersection by using median deflectors and a center island to force vehicles around a circle.



Seagrove's Farm (left) and Beaver Creek Crossings both have existing, functioning roundabouts in Apex.

### 3B.4.2 Mini-circles

Like roundabouts, mini-circles force vehicles to slow down to travel around a circle. This treatment uses a smaller center circle intended for intersections with lower traffic volumes.



Curb extensions reduce turning speeds and shorten pedestrian crossing distance in Venice, California.

### 3B.4.3 Intersection bulb-outs

This treatment involves curb extensions at intersections to narrow the travel lane. In addition to the traffic calming benefits, bulb-outs shorten crossing distances for pedestrians.

### 3B.4.4 Raised intersections

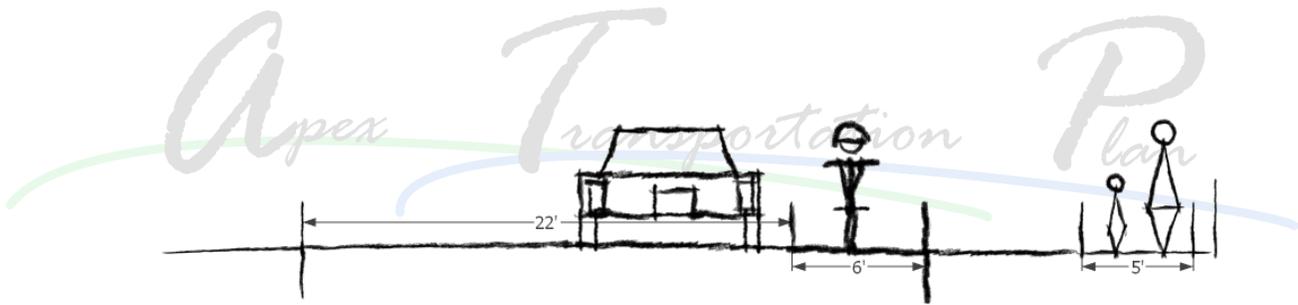
Similar to speed humps and raised crosswalks, raised intersections calm traffic through vertical deflection. This treatment raises the roadway within the intersection and improves visibility of vehicles within the intersection.

### 3B.4.5 Reduced turning radius

In areas where vehicles are turning too quickly at an intersection, smaller turning radii can help reduce vehicle speeds.

# Apex Transportation Plan

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## 3C Streets

### 3C.1 Median Treatments

Two types of medians are typically constructed on roadways:

- Two-way left-turn lanes (TWLTL)
- Raised curbs and other non-traversable medians

TWLTLs and medians improve traffic operations and safety by removing left-turning vehicles from through travel lanes. TWLTLs provide less access control, greater operational flexibility, and require minimal additional right-of-way. Raised curb medians provide greater travel safety through access control, physically separate opposing traffic, limit conflicts, allow for vegetation in the median, and provide better pedestrian refuge, but require a wider right-of-way. Because they shorten the crossing distance for pedestrians, provide a refuge for crossing, and generally improve the aesthetics of the roadway, non-traversable medians should be encouraged over two-way left-turn lanes where possible.

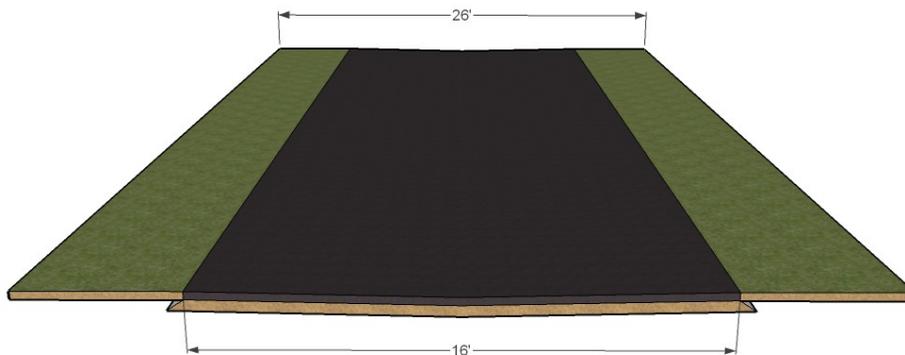
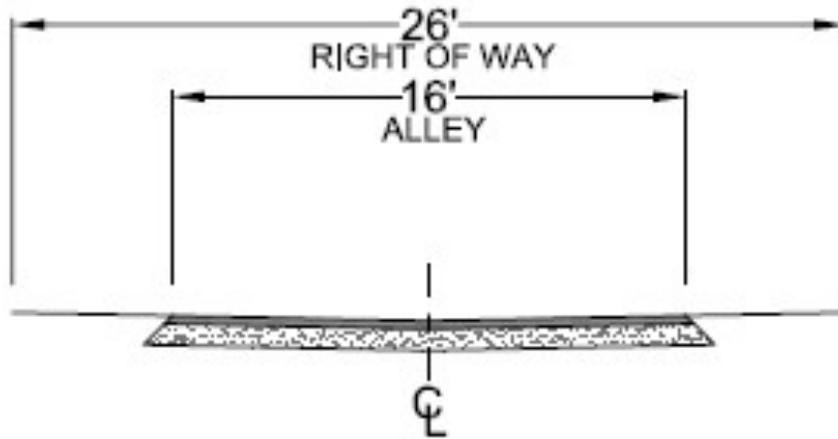


Two-way left-turn lanes (TWLTLs) and non-traversable medians provide different aesthetics and access control for a roadway. Olive Chapel Road, left, has a TWLTL near Pearson Farms while the Apex Peakway near Old Mill Village has a planted median in the center.

3C.2 Street Sections

3C.2.1 Alley

Alleys are minor streets located behind buildings that act as a shared driveway for the buildings they serve. Alleys reduce the need for driveways directly onto the main street and reduce conflicts between motor vehicles and pedestrians.

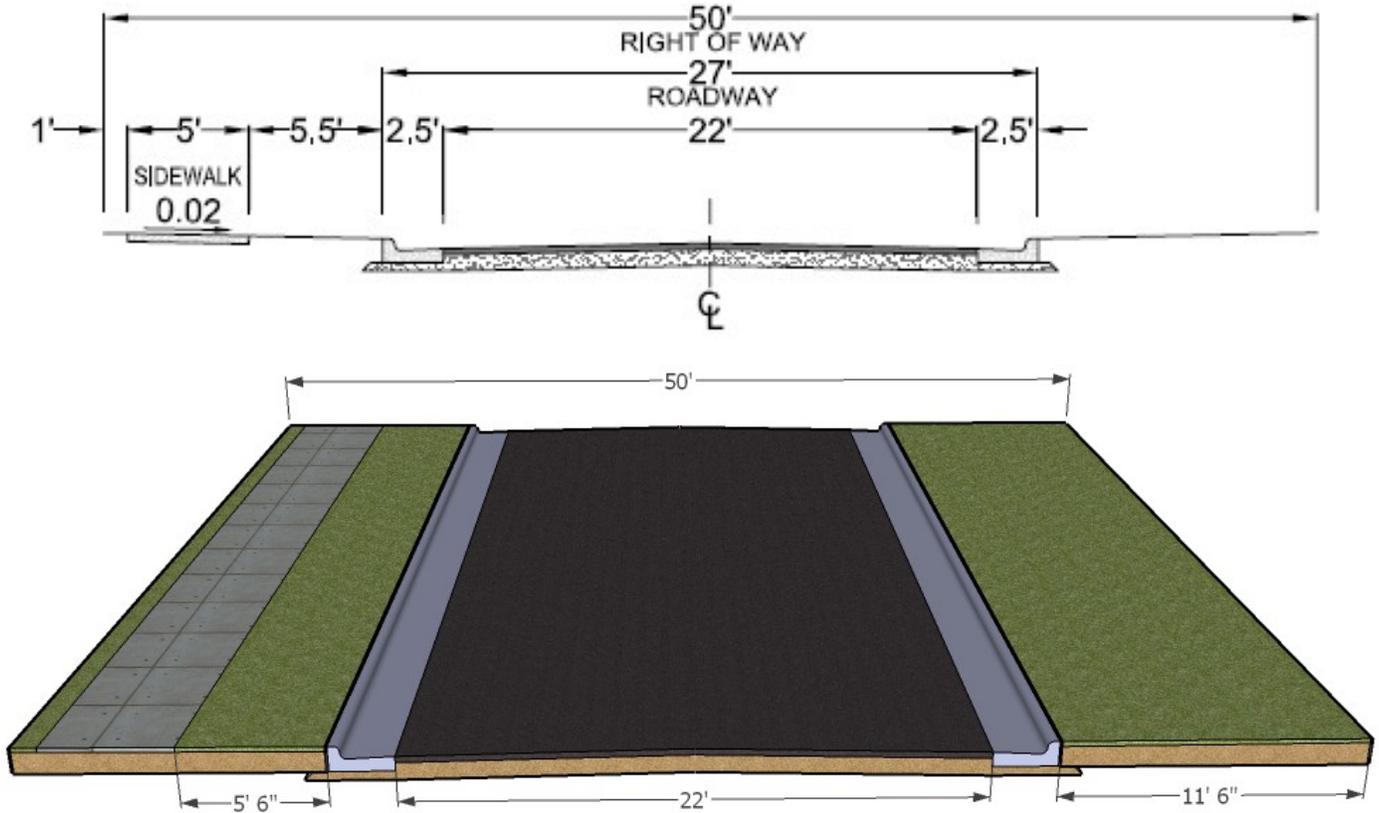


This 16-foot-wide alley in Carpenter Village in Cary is similar to Apex's new alley standard.

Design Speed	<20 mph
Design ADT	<1,000
Max Grade	10 percent
Min Centerline Radius	50 feet
Land Use/Access	All Full access

### 3C.2.2 Minor Residential Street

Minor residential streets use the smallest principal street standard for Apex. These streets are intended for low volume, low speed motor vehicle traffic and moderate pedestrian and bicycle traffic.



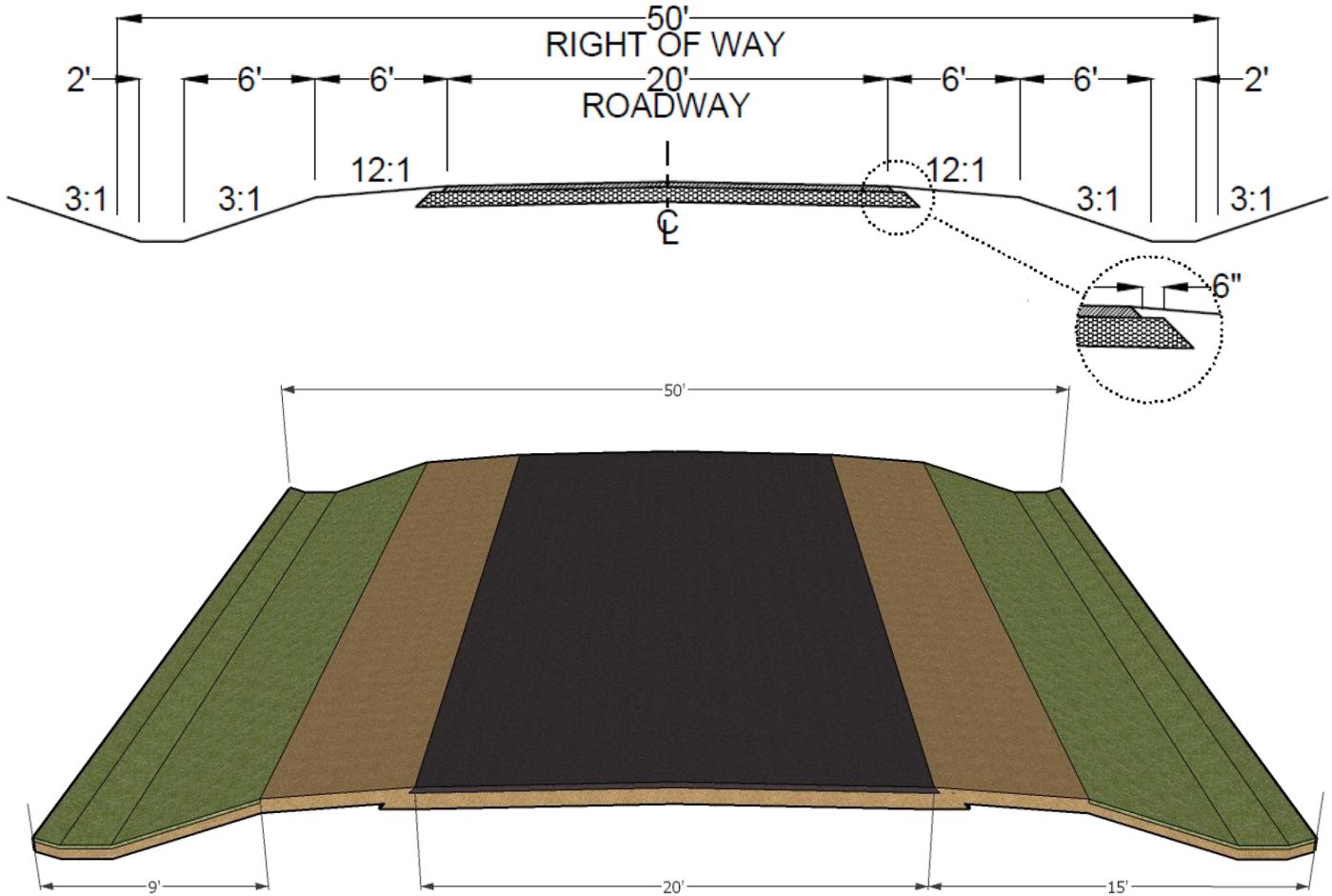
Most local streets in Apex are minor residential streets, like Vatersay Drive in Cameron Park.



Design Speed	25-30 mph
Design ADT	2,000
Max Grade	10 percent
Min Centerline Radius	150 feet
Land Use/Access	Residential Full access

### 3C.2.3 Rural Residential Street

Rural residential streets are minor streets that serve rural, low-density, residential development. These streets serve rural subdivisions that have a maximum density of one unit per acre. Due to the low density of the development, no separate bicycle or pedestrian facilities are provided.

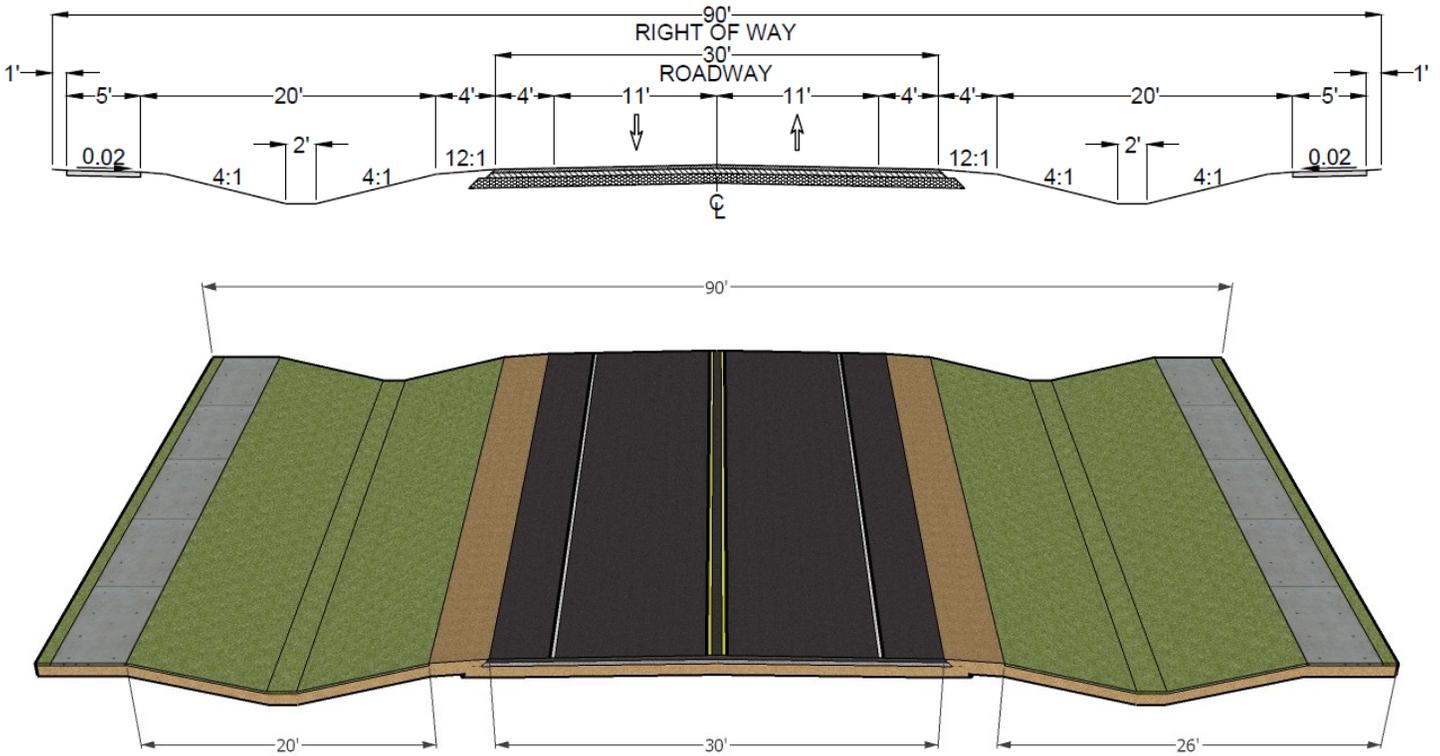


Colby Chase Drive is a rural residential street near Smith Road to the southeast of Apex.

Design Speed	25-30 mph
Design ADT	2,000
Max Grade	10 percent
Min Centerline Radius	150 feet
Land Use/Access	Residential Full access

### 3C.2.4 Rural Collector Street/2-Lane Rural Thoroughfare

Rural collector streets and 2-lane rural thoroughfares provide the basic transportation framework in the areas outside of the urbanized portions of Apex. These streets are intended for low-moderate volume, moderate speed motor vehicle traffic and low pedestrian and bicycle traffic.

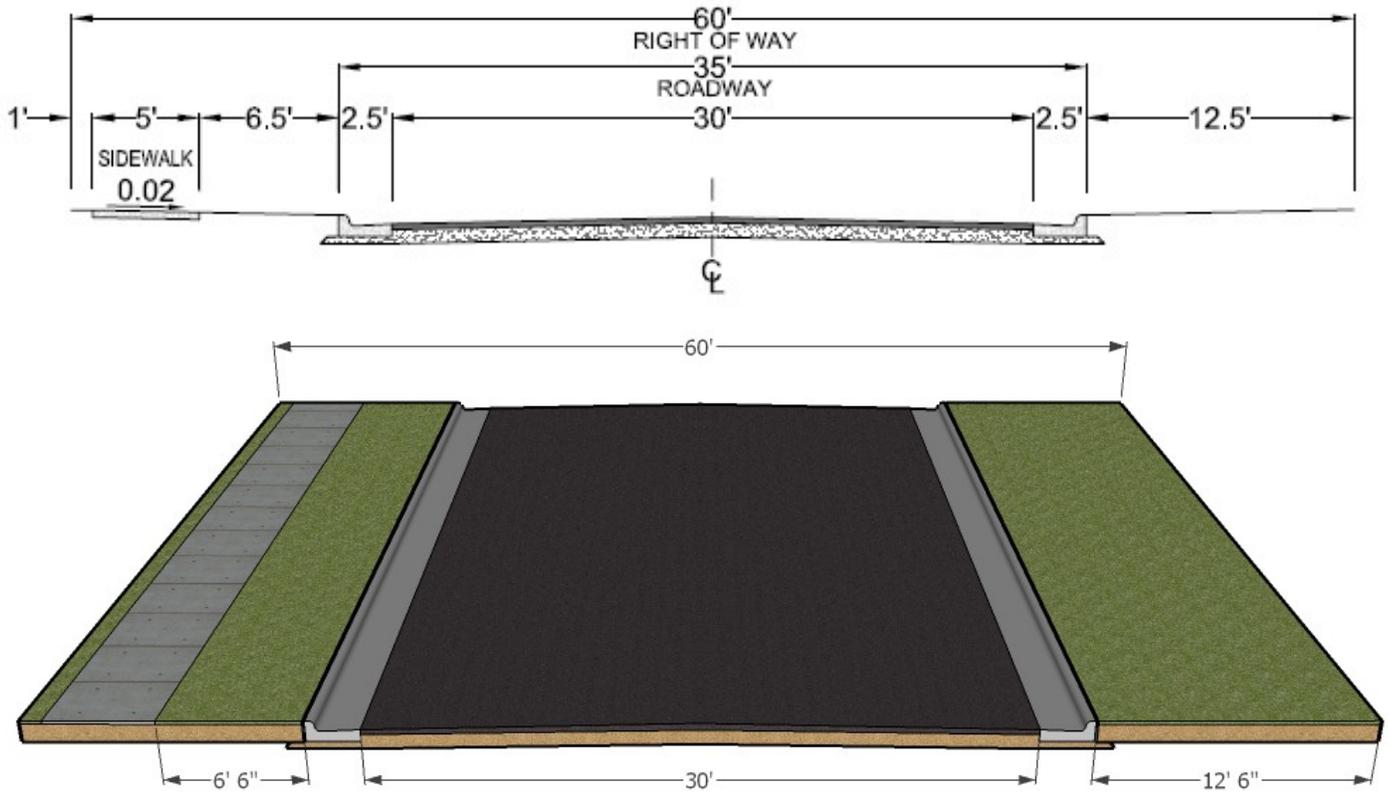


Old US 1 in New Hill is one of many 2-lane rural thoroughfares in and around Apex.

Design Speed	30-50 mph
Design ADT	15,000
Max Grade	7 percent
Min Centerline Radius	550 feet
Land Use/Access	All Full access

### 3C.2.5 Major Residential Street

Major residential streets are used for major streets running through residential subdivisions or for sections of a minor residential street at the entrance to the subdivision.

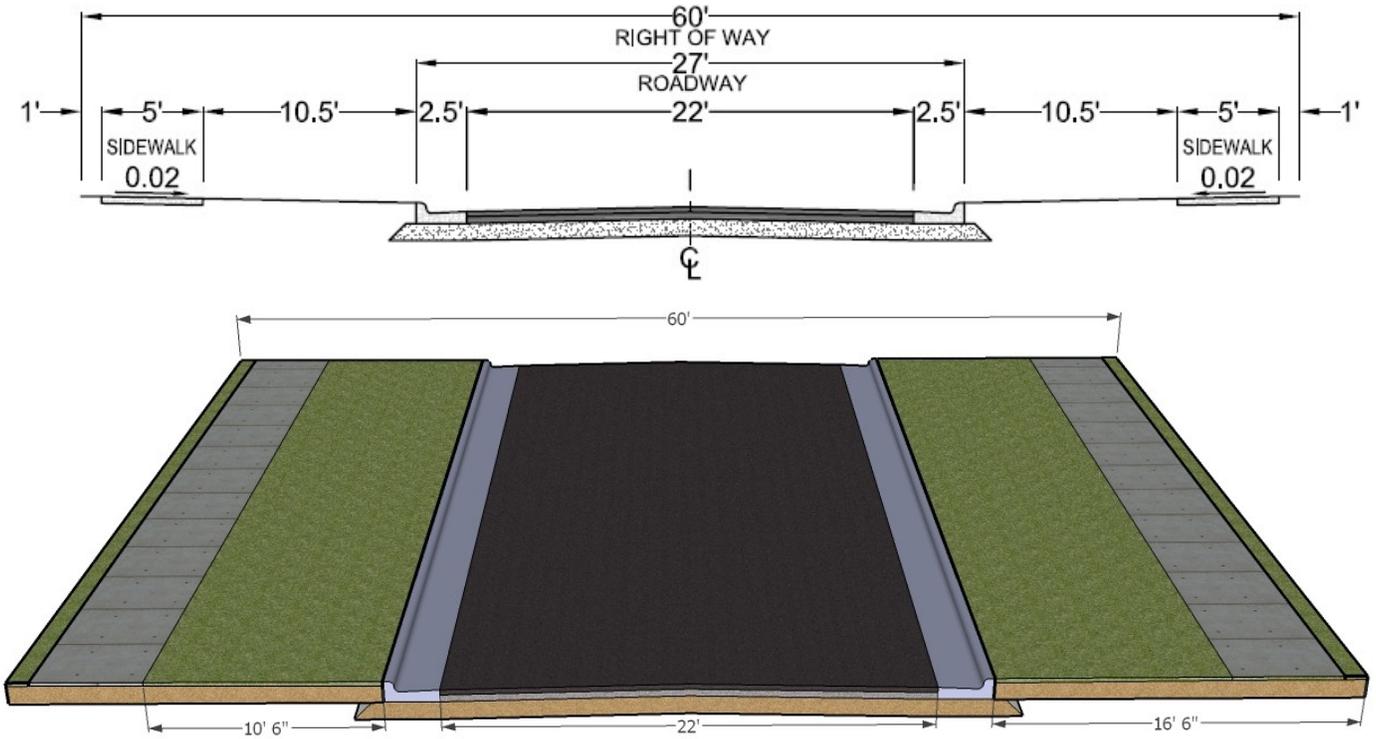


White Dogwood Road is a major residential street with a median treatment at its intersection with Olive Chapel Road.

Design Speed	25-30 mph
Design ADT	3,000
Max Grade	10 percent
Min Centerline Radius	150 feet
Land Use/Access	Residential Limited access

### 3C.2.6 Minor Collector Street

Minor collector streets have the same roadway layout as minor residential streets, but are located on a wider right-of-way with sidewalks on both sides of the street. These streets are intended for low-moderate volume, low speed motor vehicle traffic and moderate pedestrian and bicycle traffic.



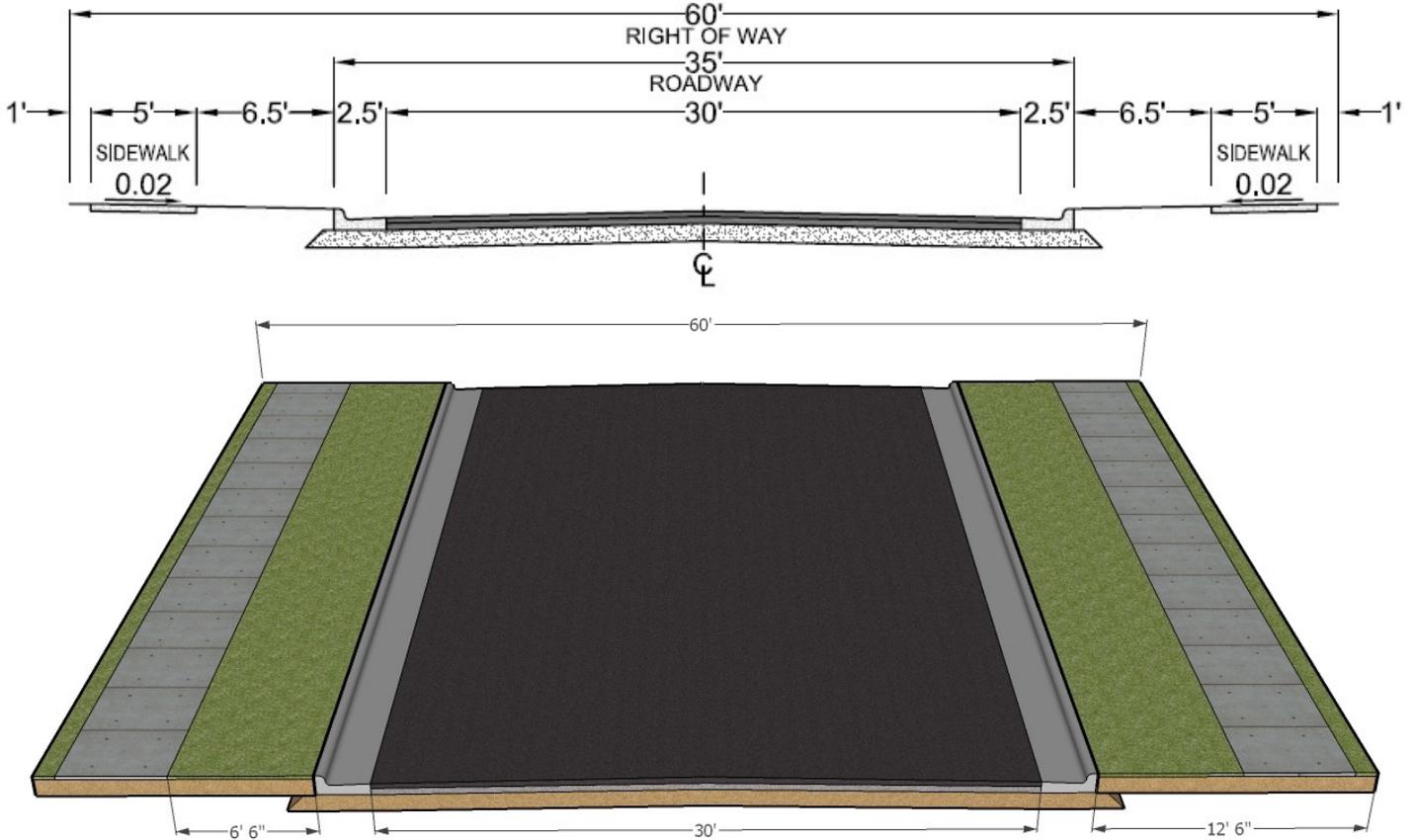
Minor collector streets, such as Reliance Avenue shown here, have a similar footprint as minor residential streets, but are designed for slightly more traffic.



Design Speed	30-40 mph
Design ADT	5,000
Max Grade	7 percent
Min Centerline Radius	550 feet
Land Use/Access	All Full access

### 3C.2.7 Major Collector Street

Major collector streets have 8 additional feet of roadway width than the minor collector streets. These streets are intended for moderate volume, moderate speed motor vehicle traffic and moderate pedestrian and bicycle traffic. Major collectors prohibit direct access by residential driveways.

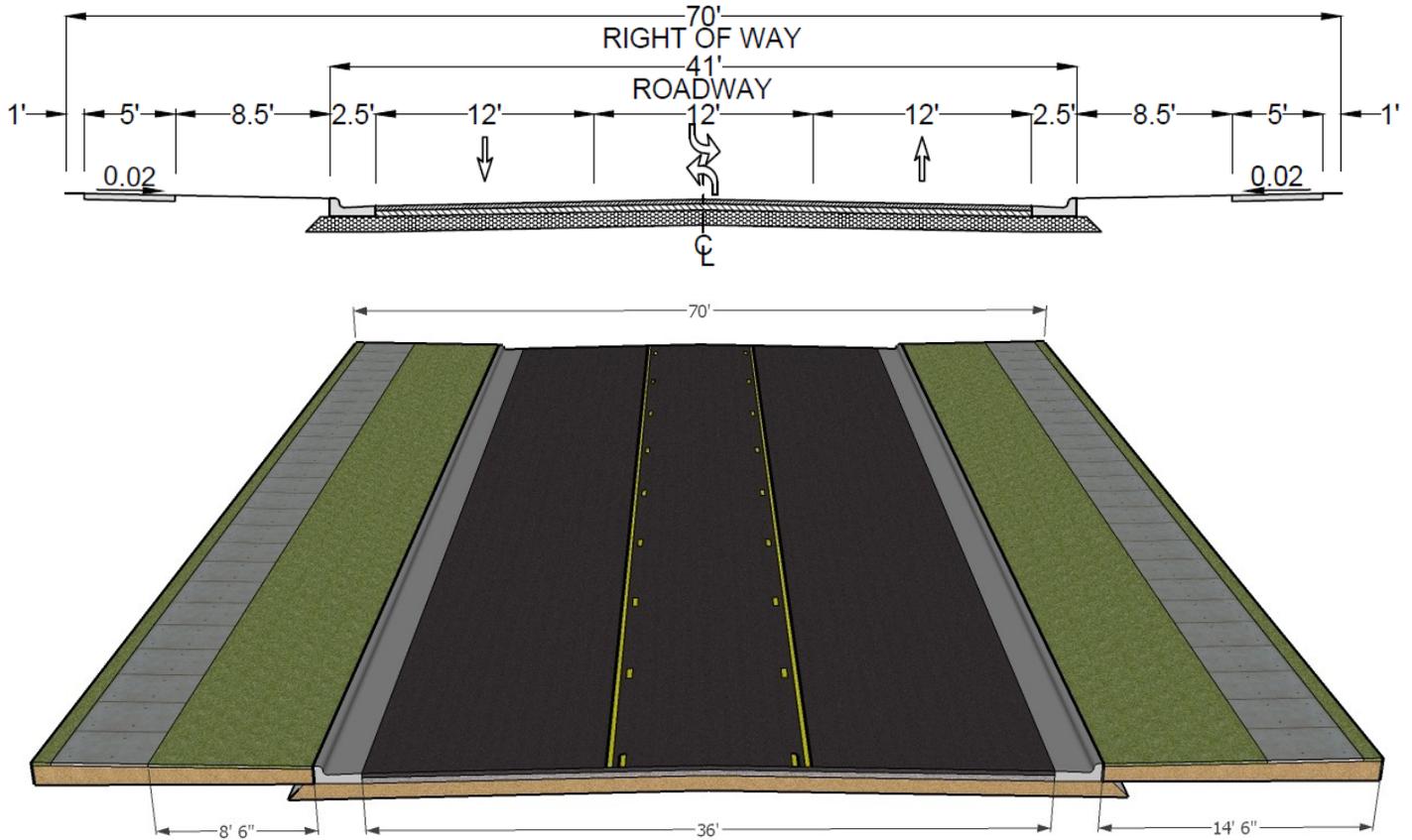


Perry Road is one of Apex's existing major collector streets.

Design Speed	30-40 mph
Design ADT	5,000
Max Grade	7 percent
Min Centerline Radius	550 feet
Land Use/Access	All No residential access

### 3C.2.8 3-Lane Thoroughfare

3-lane thoroughfares are typically minor roads that have a high volume of turning movements. These streets separate turning movements from through movements to improve motor vehicle flow.



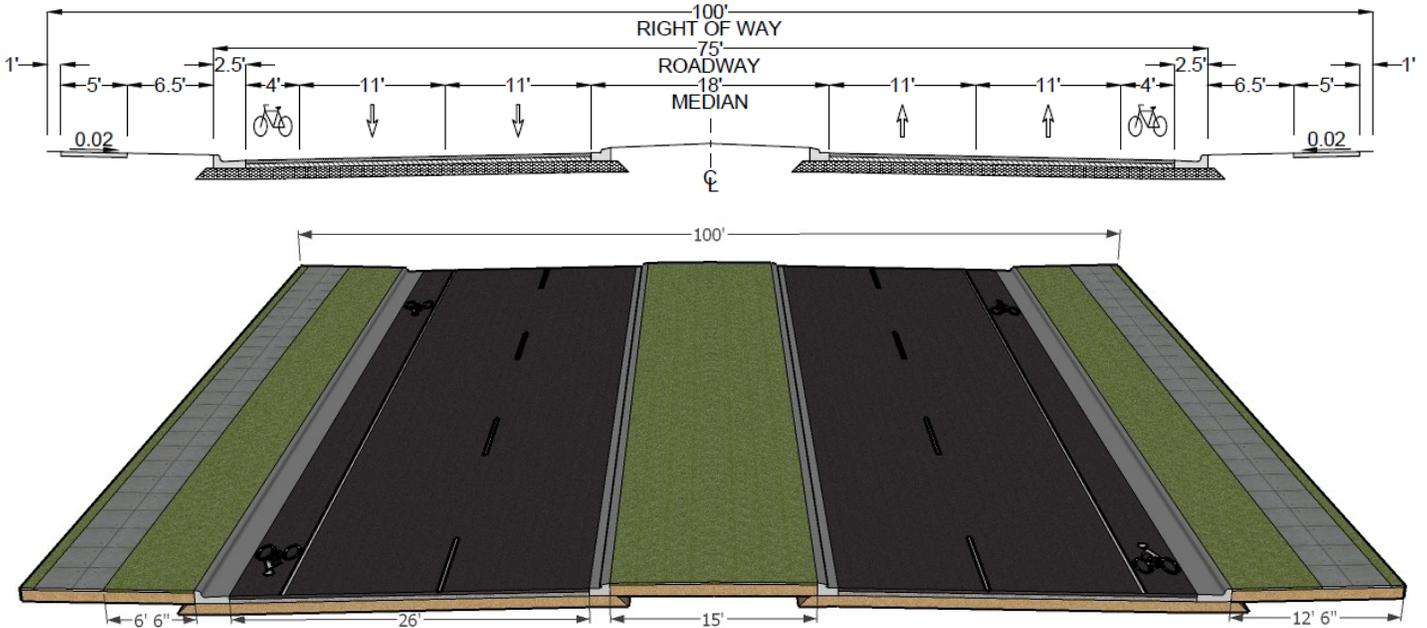
NC 55 near Apex Middle School is a 3-lane thoroughfare in town.



Design Speed	35-50 mph
Design ADT	15,000
Max Grade	7 percent
Min Centerline Radius	550 feet
Land Use/Access	All Full access

### 3C.2.9 4-Lane Median-Divided Thoroughfare

4-lane median-divided thoroughfares accommodate the highest degree of motor vehicle mobility. These streets separate turning movements from through movements to improve motor vehicle flow. Despite the high mobility of motor vehicle traffic, these streets provide for low-moderate pedestrian and bicycle traffic.

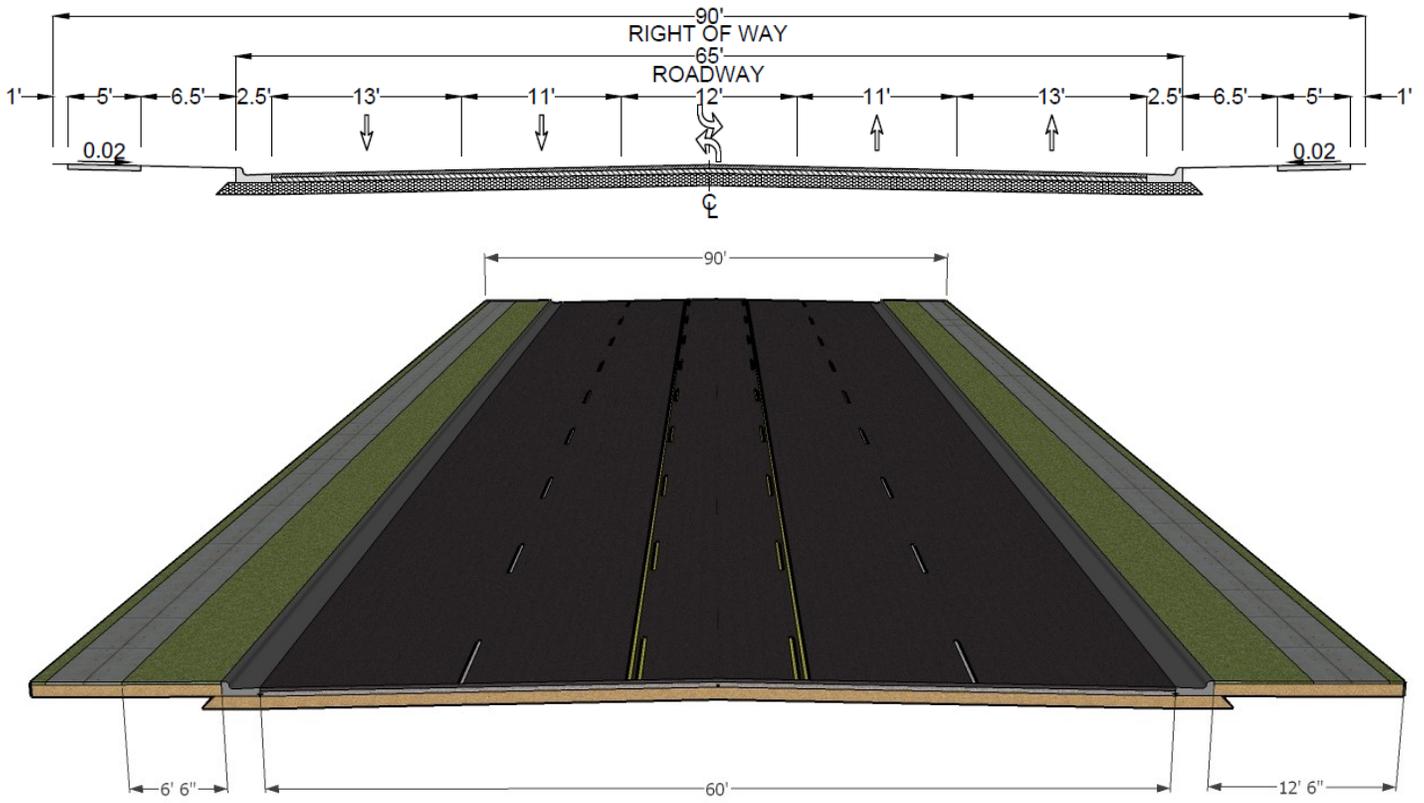


The section of the Apex Peakway near Broadstone Station is a 4-lane median-divided roadway.

Design Speed	40-50 mph
Design ADT	30,000
Max Grade	7 percent
Min Centerline Radius	850 feet
Land Use/Access	All Limited access

3C.2.10 5-Lane Thoroughfare

5-lane thoroughfares provide two through lanes in each direction and a continuous two-way left turn lane in the middle to accommodate turning movements. Because of the high number of turning movements and the wide pavement width, these streets have low mobility for pedestrian and bicycle traffic. As a result, 5-lane thoroughfares should be discouraged except where absolutely necessary.



NC 55 south of US 1 is a standard 5-lane roadway in Apex.



Design Speed	40-50 mph
Design ADT	30,000
Max Grade	7 percent
Min Centerline Radius	700 feet
Land Use/Access	All Full access

# Apex Transportation Plan

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# N Salem St

## 3D Intersections

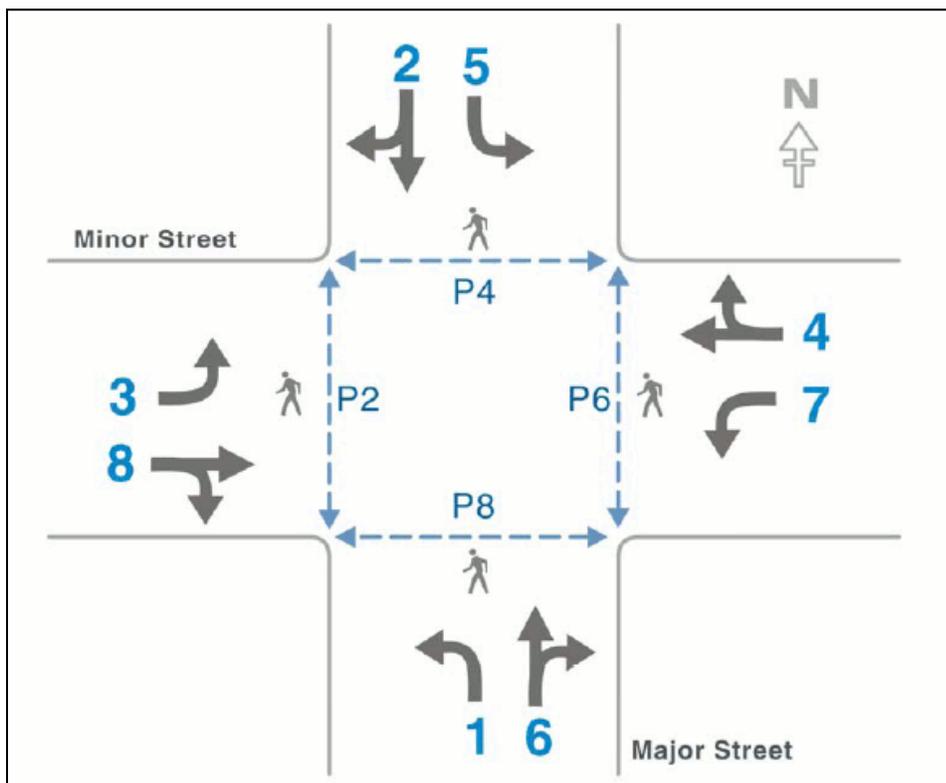
### 3D.1 At-grade Intersections

#### 3D.1.1 Stop Control

A basic treatment for intersections with low daily traffic is stop control. In this treatment one or more of the intersection legs has a stop sign to determine which vehicles must yield the right-of-way.

#### 3D.1.2 Signalized Intersection

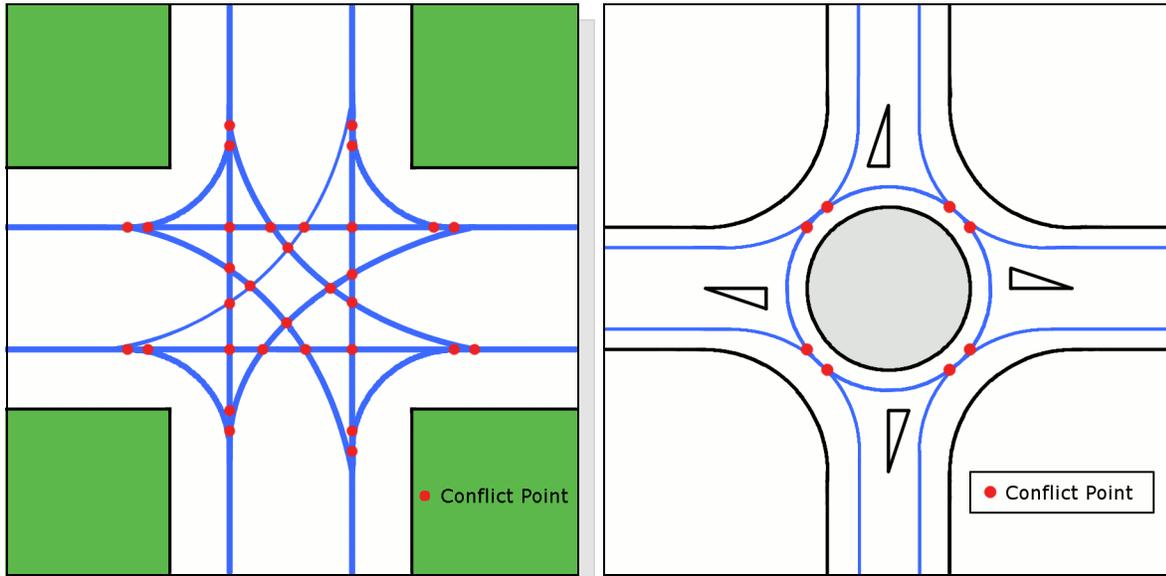
For intersections with greater traffic or heavier turning movements, a traffic signal may be necessary to improve safety and mobility. The benefits of these treatments are direct access for users in all directions and familiarity for drivers. Turning conflicts, however, can make these intersections unsafe for drivers and pedestrians, and the more permitted phases that are signalized, the greater the delay for other phases.



Signalized intersections often have 8 phases of permitted movements that can cause delay for other roadway users.

### 3D.1.3 Roundabout

Roundabouts and traffic circles are intersection treatments that keep traffic moving by providing yield-controlled access on the approach legs. Roundabouts can be single-lane or multi-lane. This intersection design has been shown to be safer and more efficient than a standard signalized intersection, namely by reducing the number of conflict points between vehicles and by reducing start-up times through free-flow movement. Roundabouts are also beneficial as they require pedestrians to cross only 1 direction of traffic at a time.



A standard 4-leg intersection has 32 vehicle conflict points while a 4-leg single lane roundabout has only 8 conflict points.

### 3D.1.4 Superstreet

This intersection treatment eliminates the left-turn and through movements from the side streets onto the main street. Instead of making a left-turn from the side street onto the mainline, a driver would turn right and then make a u-turn. Superstreets essentially convert a two-way street into parallel one-way streets and improve mobility along the mainline.



US 17 in Leland (left) and US 15-501 in Chapel Hill are two types of superstreet treatments in North Carolina.

Source: [www.ncdot.org](http://www.ncdot.org)

### 3D.2 Grade-separated Intersections

There are numerous intersection designs that separate cross movements on different grades or levels. Below are three specific designs.

#### 3D.2.1 Compact Diamond Interchange

Compact diamond interchanges are a standard interchange design with ramps on all four quadrants with an attempt to minimize the footprint of the facility. Crossing movements between the two roadways are physically separated with a bridge.



A compact diamond interchange is used at I-440 and Poole Road in east Raleigh.

#### 3D.2.2 Single Point Urban Interchange

The single point urban interchange or SPUI is a compact interchange design that manages all turning movements on and off the ramps using one traffic signal instead of multiple signals. This design reduces the footprint of the interchange but the long crossing distances and frequency of turning movements creates a highly undesirable pedestrian environment.



The Fayetteville Road and I-40 interchange in Durham incorporates a single point design.

### 3D.2.3 Modern Roundabout Interchange

The modern roundabout interchange is another design that attempts to minimize the footprint of the interchange by combining the intersections for the ramps. Instead of signals at these intersections, however, there are roundabouts that intersect to create an elongated roundabout design. The minimal turning conflicts of this design make it safer and more appealing for pedestrians.



An artistic rendering shows the future design of a modern roundabout interchange along Keystone Parkway in Carmel, Indiana. Several of these interchange designs are currently under construction in Carmel.



## 4.0 Needs and Opportunities

### 4.1 Diverse Transportation Benefits<sup>1</sup>

There are numerous reasons to support a diverse transportation network. A diverse transportation network includes both motorized modes such as driving and nonmotorized transportation modes such as walking or bicycling. The benefits of walking and bicycling include (but are not limited to):

- Active living
- Social equity
- Environmental health
- Transportation choice

#### 4.1.1 Active Living

Designing communities that provide opportunities to walk, ride a bike, or otherwise be active is essential to allow people to engage in healthy behavior in all aspects of their lives. By providing a transportation network for nonmotorized activity the Town becomes a place where citizens can be active in their daily routines, instead of simply at the gym. According to the Centers for Disease Control and Prevention, physical activity can help reduce the risk of:

- Heart disease
- Obesity
- Type 2 diabetes
- High blood pressure
- Osteoporosis
- Depression

#### 4.1.2 Social Equity

Walking, bicycling, and other forms of active transportation are available to all members of society. In contrast, driving is available only to those who have access to an automobile and who have a driver's license. According to the National Household Travel Survey



A linear park promotes active living in San Diego, California.

<sup>1</sup> - Adapted from "Why Walk" created by the Pedestrian and Bicycle Information Clearinghouse. (<http://www.walkinginfo.org/why/>)



Pedestrian facilities help children and young adults have mobility without relying on their parents to drive them.

conducted in 2001, households with an annual income of less than \$25,000 are nine times more likely to have no car than those with a higher annual income. Additionally, children under the age of 16 and many older adults are unable to drive. Providing transportation choices for these populations is important to ensure that all members of a community have adequate mobility.

#### 4.1.3 Environmental Health

Motorized transportation contributes significantly to greenhouse gas emissions. From 1990 through 2006, the transportation sector accounted for approximately 30% of the total carbon dioxide emissions in the United States, with

over 60% of those gases coming from the burning of gasoline to power personal vehicles (EPA Inventory report). Replacing motorized trips with nonmotorized trips eliminates almost all of the emissions generated by the trip, thus minimizing the environmental impacts of mobility.

#### 4.1.4 Transportation Choice

According to analysis by the Triangle Regional Model, traffic will increase substantially in Apex by 2035. Simply attempting to meet this increase in transportation demand with an increase in network supply (new road construction and widening of existing roads) would be extremely costly economically, environmentally, and socially. In addition to increasing the supply of roads, the Town must also improve the supply of active transportation facilities and transit networks, as well as addressing transportation demand through land use decisions that shorten or eliminate trips.

By addressing travel demand multi-modally, the Town can create choice in the means of travel. When travel by car is not feasible or is undesirable, mobility is not completely compromised due to the presence of the other modes.



When provided a choice in transportation, some people choose active modes that reduce the number of cars on the road.

### 4.2 Projected Conditions

#### 4.2.1 Growth Areas

Through its Comprehensive Plan adopted in 2004, the Town identified five activity centers as areas that could accommodate growth at higher densities than are currently present in Apex (see **Figure 4.1**). Spread across the town limits, these activity

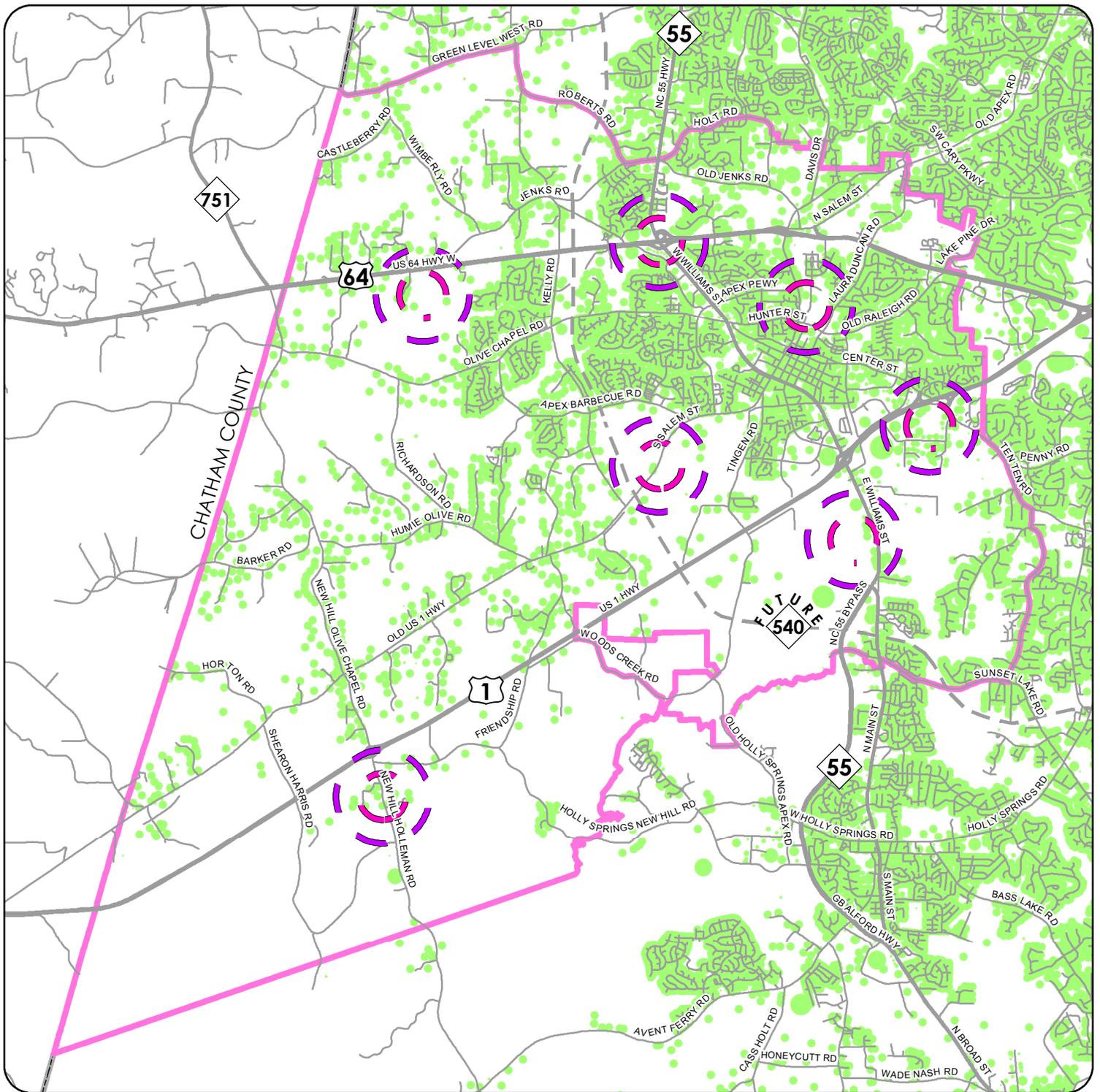
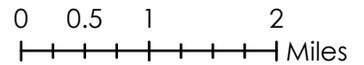


Figure 4.1  
Growth Areas



- Existing Building
- Activity Center 1/4-Mile
- Activity Center 1/2-Mile
- Study Area
- County Line
- Street

# Apex Transportation Plan

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centers allow for a greater mix of uses and services than are typically found with standard zoning. Two of the five proposed centers have been, or are currently being, developed. Supplementing these areas are four proposed Neighborhood Commercial Activity Centers shown on the 2025 Land Use Plan. Like the Comprehensive Plan activity centers, these areas are intended to be small, dispersed town centers to create a better mix of land uses.



The I-540/South Salem Street Plan shows a future development that could act as a significant growth center.

#### 4.2.2 Population

As indicated throughout this plan, the Town of Apex has experienced tremendous growth over the past 30 years. Starting with a population of less than 3,000 people in 1980, the Town grew to a population of roughly 5,000 people in 1990 and over 20,000 people in 2000. As of the 2010 Census, the population of Apex is approximately 37,500 people. Annual growth rates for the Town have generally decreased since 2000 (see **Figure 4.2**); however, the Town's growth rate has remained high with a 5-year average growth rate of 2.74 percent. Extending that rate into the future, Apex will reach a population of roughly 70,000 by the year 2030 (see **Figure 4.3**).

#### 4.2.3 ADT

Like the population, motor vehicle traffic is expected to grow significantly over the next few decades. Projected traffic volumes for the Town are taken directly from the Triangle Regional Model with all existing plus committed infrastructure including the western and southern extensions of NC 540 completed as a toll facility.

It is important to note that the model is a prediction of future volumes based on socio-economic data and roadway link input. If projects are not completed as included in the model (e.g. new roadways, roadway widening, new interchanges), or population and employment does not match projections, then traffic volumes may differ dramatically from what was projected. The future volumes anticipated by the model are not a substitute for an individual roadway traffic forecast that would be required during pre-construction for state or federally funded projects. **Figure 4.4** shows traffic volumes as projected by the Triangle Regional Model.

### **Traffic Congestion**

Congestion in corridors is related to a number of factors, but is most often the result of bottlenecks, primarily at intersections with other streets or major driveways, along the corridor. When traffic volumes are at or over capacity for the through travel lanes, turning movements associated with driveways to homes or small businesses can also have a major impact, particularly if turn lanes are not present or are insufficient. Capacity problems not only add to driver frustration, but adversely impact safety and delay emergency response vehicles.

# *Apex Transportation Plan*

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# Apex Transportation Plan

Figure 4.2 -- Apex 10-year Population Growth Rates

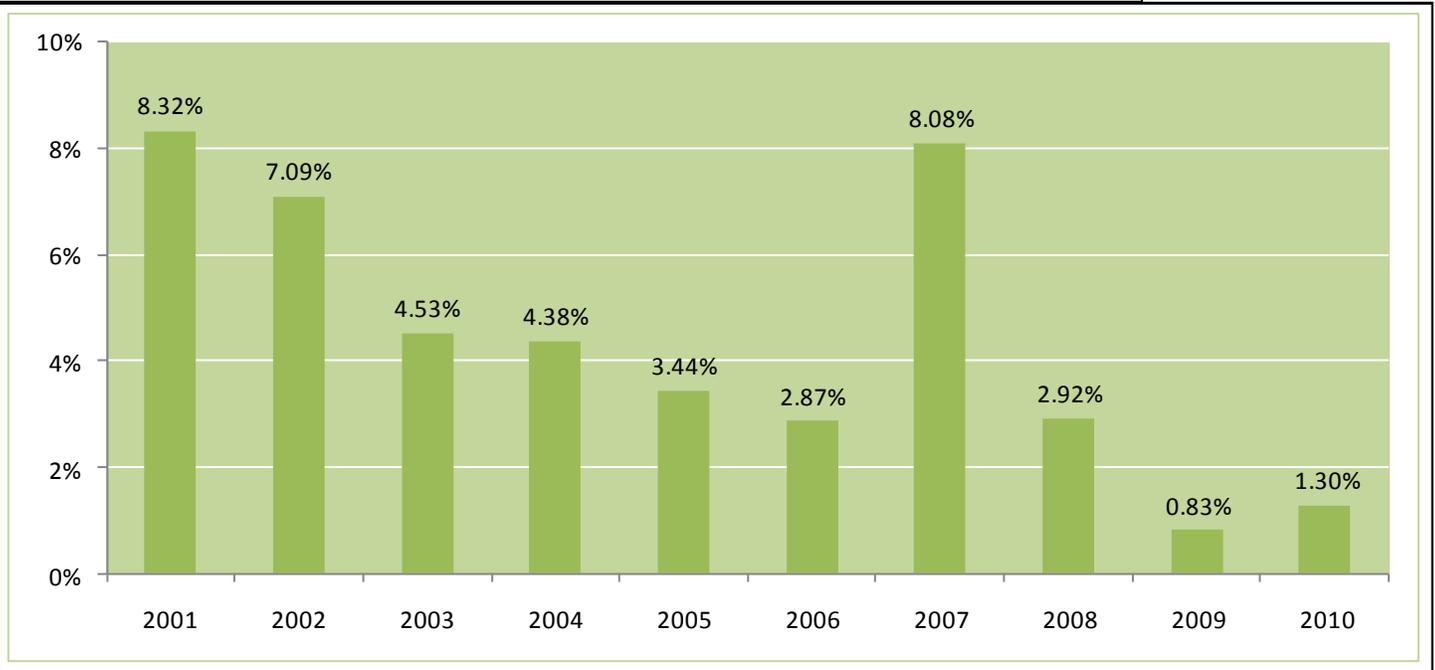
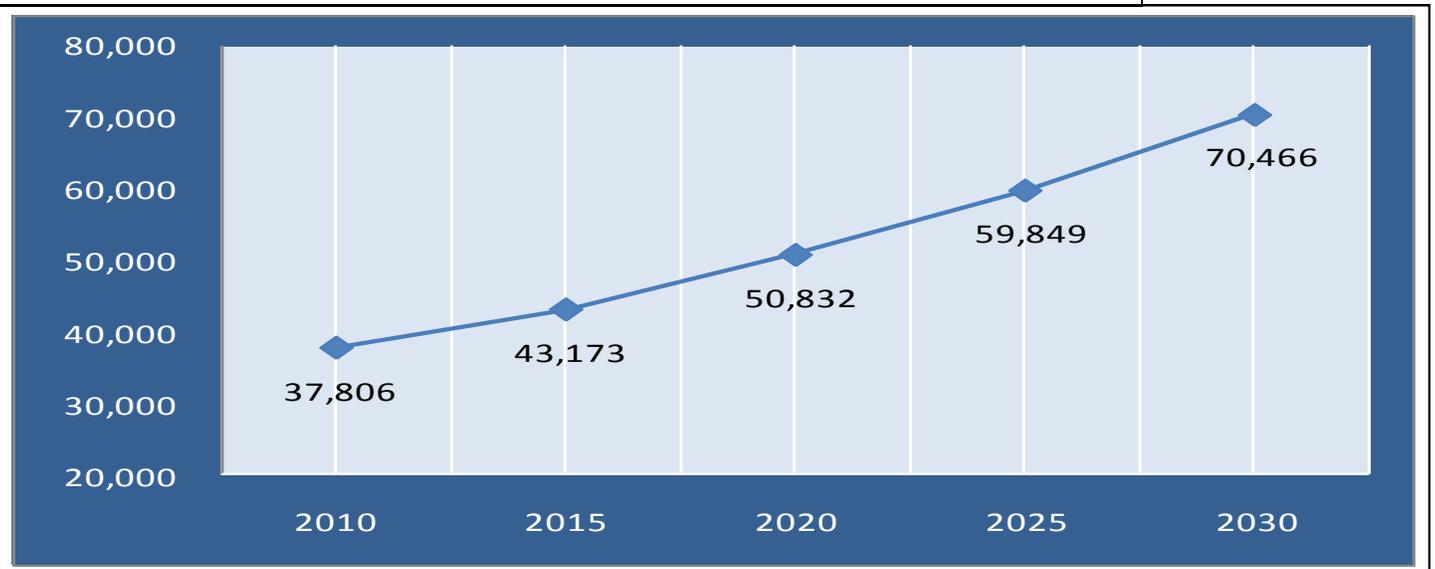


Figure 4.3 -- Apex Population Projection from 2010 - 2030



# Apex Transportation Plan

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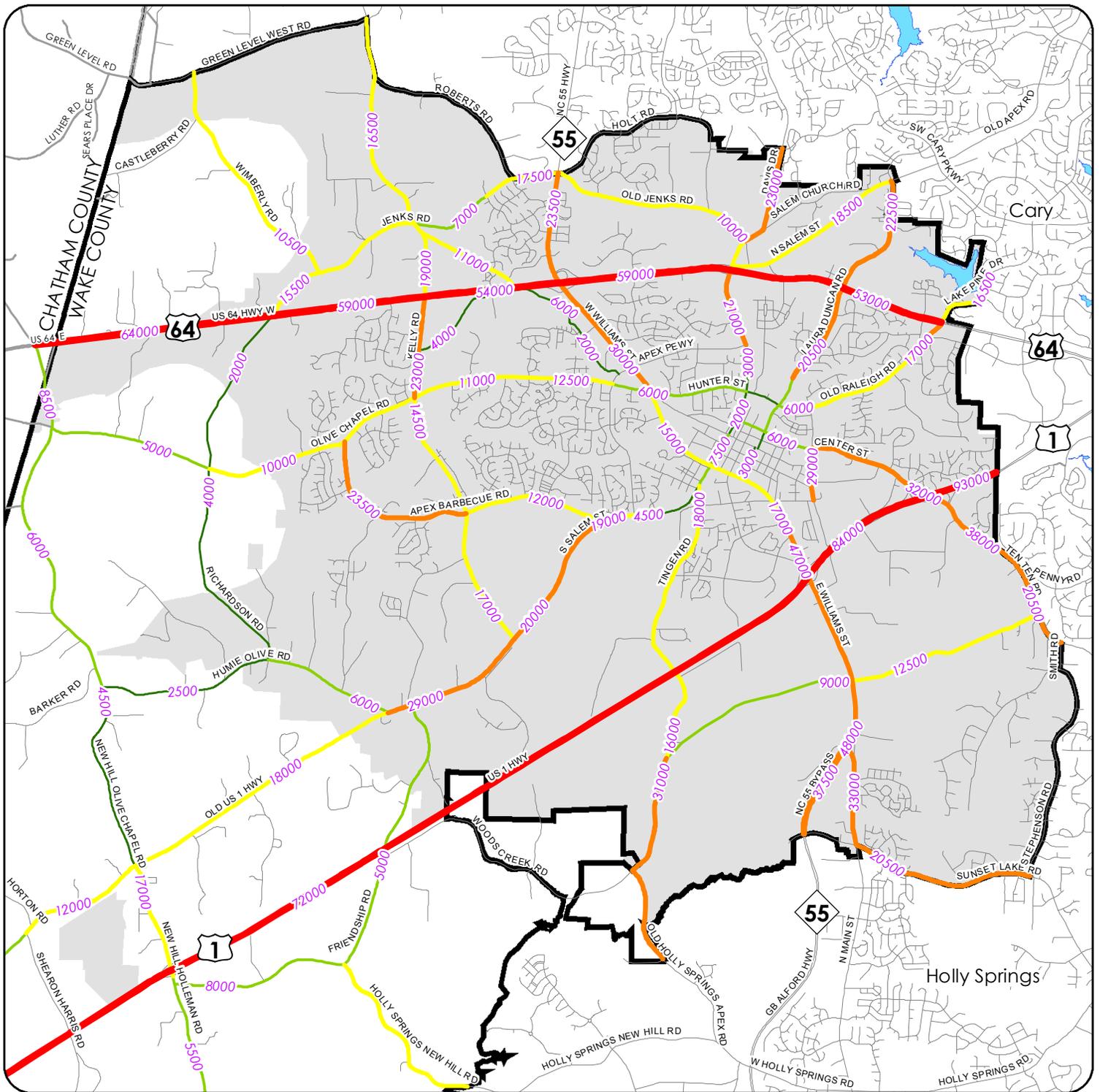
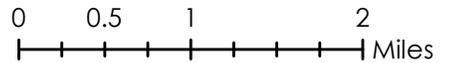


Figure 4.4  
 2035 Projected Daily  
 Traffic Volume



- Volume at NCDOT Existing Data Locations
- 2000-4999
  - 5000-9999
  - 10000-19999
  - 20000-49999
  - 50000-93000
  - Existing Street
  - Study Area
  - County Line
  - Lake
  - Apex Jurisdiction

# Apex Transportation Plan

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# Apex Transportation Plan

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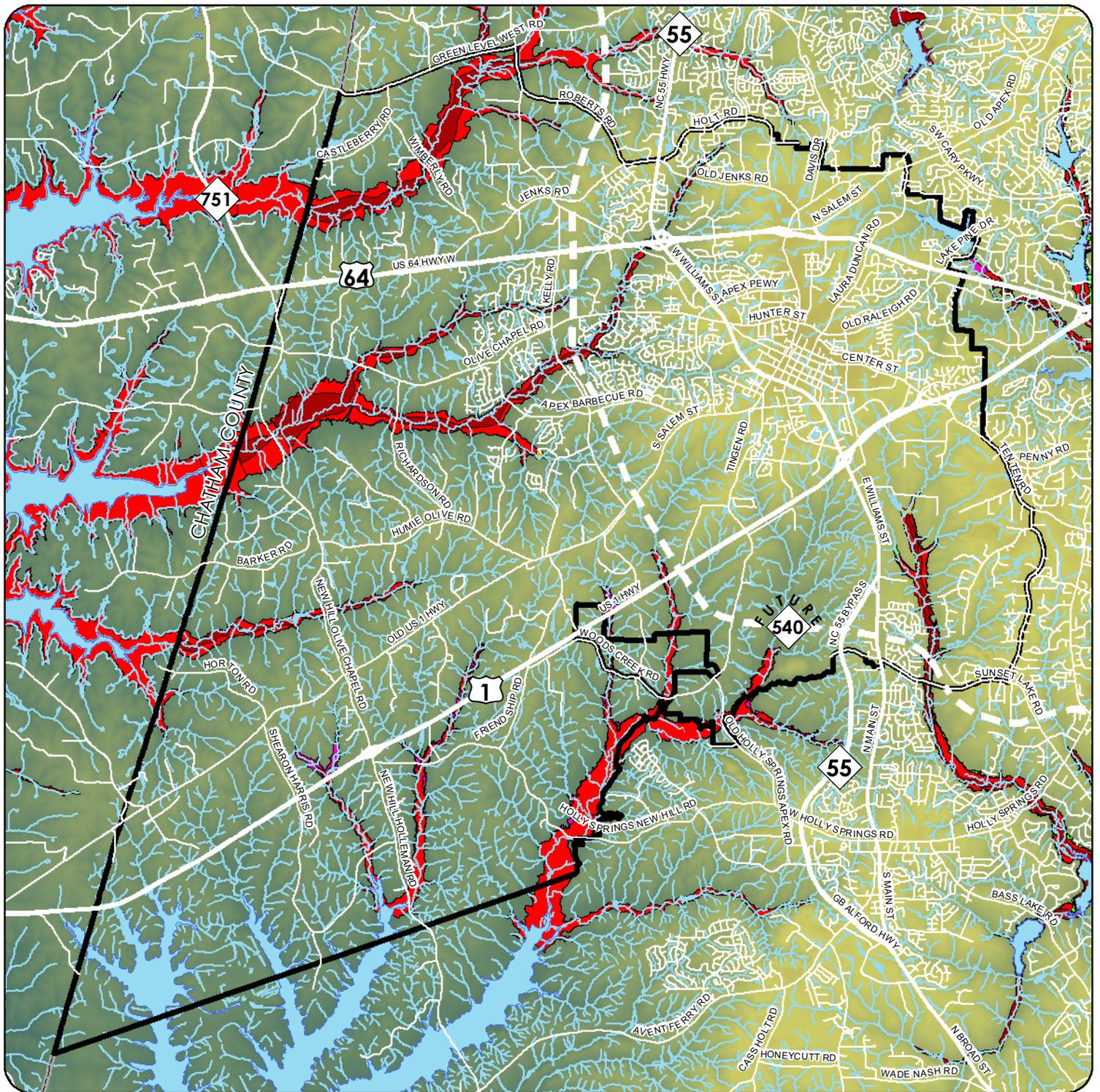
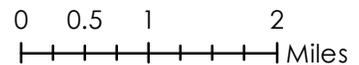


Figure 4.5

# Environmental Features



-  100-Year Flood Hazard (Future Conditions)
-  100-Year Floodplain (No BFEs Determined)
-  100-Year Floodplain (BFEs Determined)
-  100-Year Floodway
-  500-Year Floodplain

-  Stream
-  Water Body
-  Study Area
-  County Line

# Apex Transportation Plan

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Construction of the Western Wake Freeway began in 2009 and will be open to traffic in 2012.

All together, the Western Wake Freeway project will create a continuous 70+ mile loop around the greater Raleigh area. Long-term effects of the project are yet to be determined, but the loop will provide increased automobile mobility and create growth demands in communities farther from the urban core of Raleigh than currently exist.

#### *US 64 Conversion to Expressway/Freeway*

The North Carolina Department of Transportation NCDOT recently conducted a study of a 19-mile section of US 64 from Pittsboro to Cary. Identified as an NCDOT Strategic Highway Corridor, this section of highway will be upgraded to an expressway around Jordan Lake and within Cary and converted to a freeway in the other sections of the study area. This conversion will increase automobile mobility along this strategic corridor and automobile connectivity between Chatham and Wake counties. The corridor report can be found at:

<http://www.ncdot.org/doh/preconstruct/tpb/SHC/studies/US64/Report/>

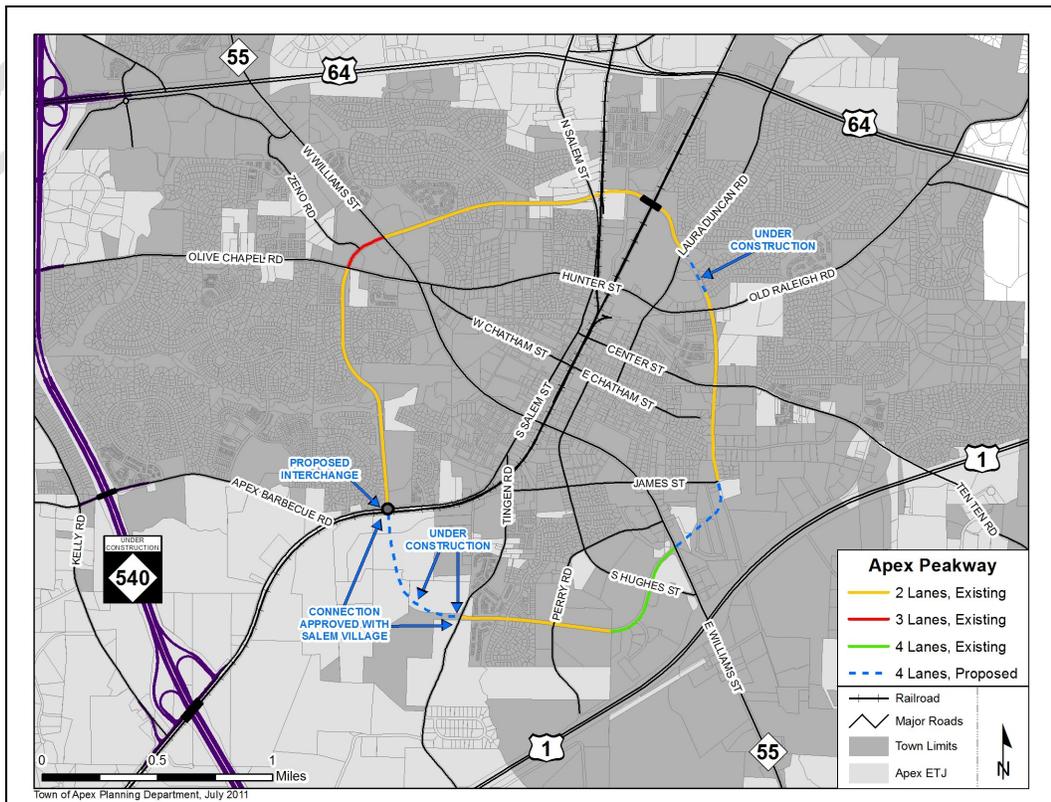
#### *Apex Peakway*

Currently under construction, the Apex Peakway is a future four-lane divided loop road around downtown Apex. When complete the Apex Peakway will be a 5.86 mile continuous minor thoroughfare that encircles the urban area of the Town. The Apex Peakway is intended to provide additional connections to areas outside the downtown street grid to improve mobility throughout the town.

In order to prevent the Apex Peakway from becoming a auto-dominated "moat" of high motor vehicle traffic volumes, the roadway is planned to include pedestrian signals, crosswalks, and a 10-foot multi-use path along the inside lanes, as well as wide outside travel lanes in the roadway to serve bicycles.



This photo simulation shows the future design for US 64 traveling west over Jordan Lake.



The existing and future sections of the Apex Peakway, a loop road around downtown, are shown here as of July 2011.

#### 4.2.6 Regional Rail Transit

In 2007 the Capital Area MPO and the Durham Chapel Hill Carrboro MPO formed a regional committee to study transit options in the Triangle. The Special Transit Advisory Commission (STAC) met over a 12-month period and made recommendations to the 2 MPOs regarding regional transit needs.

The STAC produced a Regional Transit Vision Plan which recommended 3 improvements to Transit in the Triangle:

- Enhanced Region-wide Bus Network
- Circulators
- Rail Investments

The plan recommends increasing regional bus service to connect various communities, local circulator buses within major activity centers, and rail upgrades to allow for high quality, high frequency rail transit between major urban centers. The original STAC recommendations are shown in **Figure 4.6**.

The plan includes a plan for funding the improvements. The main financial tools to fund the plan are a 1/2 cent sales tax increase, a

\$10 increase in vehicle registration fee, and debt financing. North Carolina House Bill 148 authorized the establishment of a Congestion Relief and Intermodal Transportation 21st Century Fund generated from the former two sources, pending local approval by referendum. The bill was signed by Governor Purdue August 27, 2009.

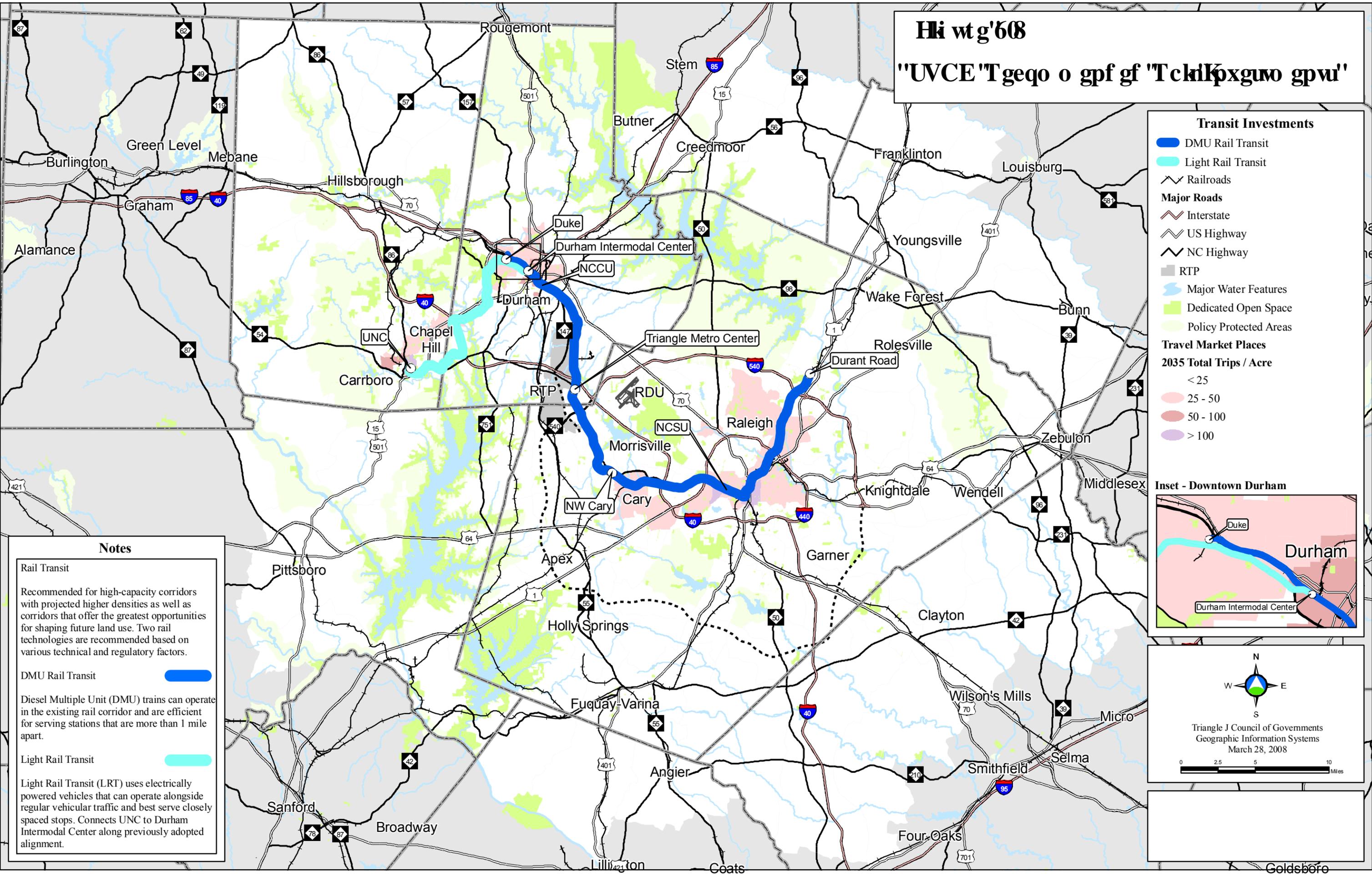
The STAC plan was amended before adoption by the MPOs to show light-rail trains throughout the region instead of light-rail in portions and diesel multiple units in others. Additionally, the Capital Area MPO shows a light rail line extending from the Cary train station down to Apex. The Capital Area MPO Transit Plan is shown in **Figure 4.7**.

# Apex Transportation Plan

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**Transit Investments**

- DMU Rail Transit
- Light Rail Transit
- Railroads

**Major Roads**

- Interstate
- US Highway
- NC Highway

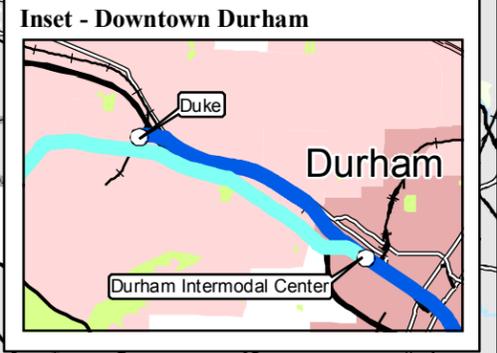
**RTP**

- Major Water Features
- Dedicated Open Space
- Policy Protected Areas

**Travel Market Places**

**2035 Total Trips / Acre**

- < 25
- 25 - 50
- 50 - 100
- > 100



Triangle J Council of Governments  
Geographic Information Systems  
March 28, 2008

**Notes**

**Rail Transit**

Recommended for high-capacity corridors with projected higher densities as well as corridors that offer the greatest opportunities for shaping future land use. Two rail technologies are recommended based on various technical and regulatory factors.

**DMU Rail Transit**

Diesel Multiple Unit (DMU) trains can operate in the existing rail corridor and are efficient for serving stations that are more than 1 mile apart.

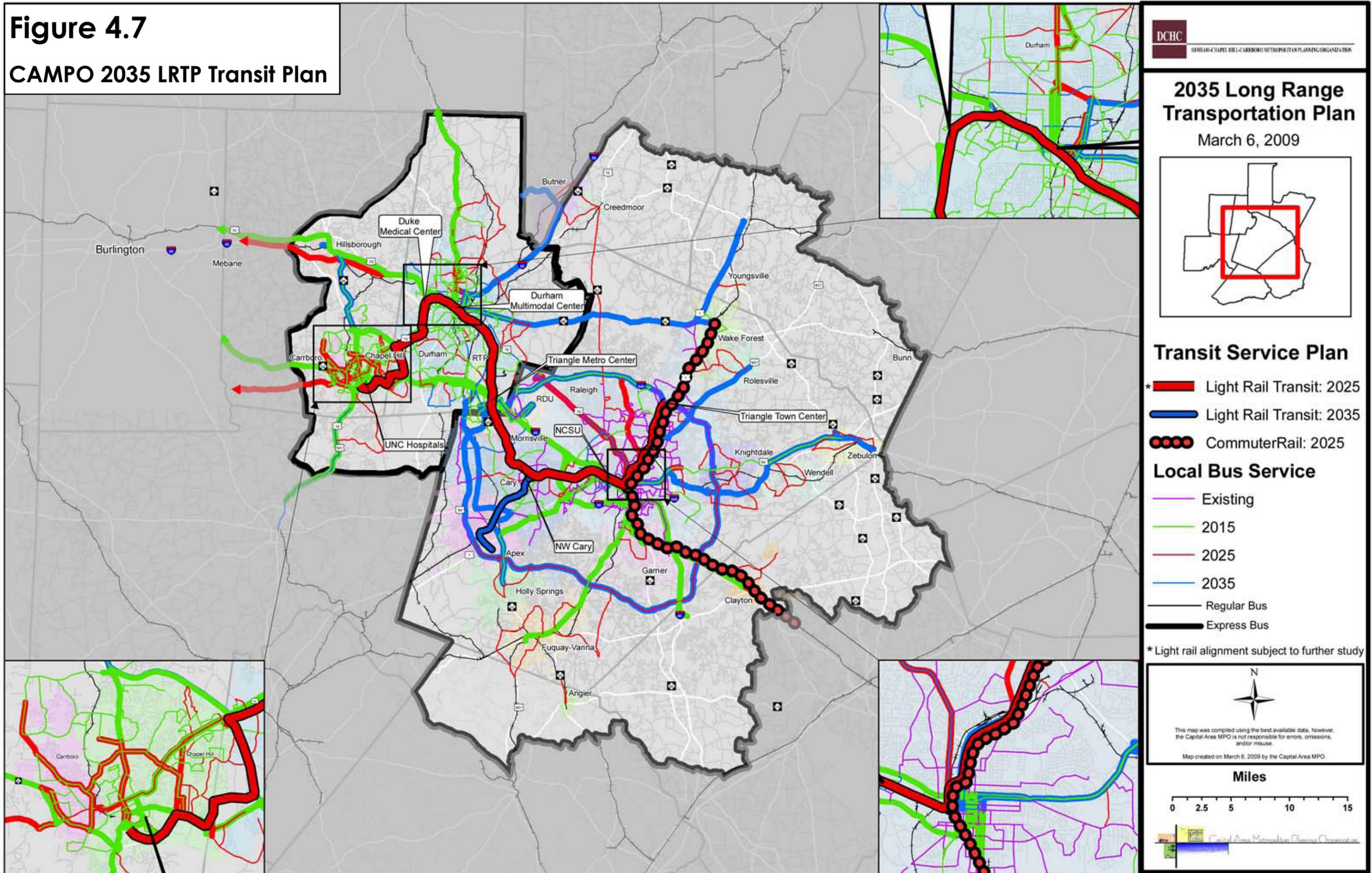
**Light Rail Transit**

Light Rail Transit (LRT) uses electrically powered vehicles that can operate alongside regular vehicular traffic and best serve closely spaced stops. Connects UNC to Durham Intermodal Center along previously adopted alignment.



**Figure 4.7**

**CAMPO 2035 LRTP Transit Plan**







## 5.0 Recommendations

The recommendations in the Apex Transportation Plan are based on an understanding of the existing culture and community in Apex and recognition of the issues facing the town in the future. Using the objectives identified during the plan visioning process, this plan establishes actions that can be undertaken to help achieve the objectives.

Following the general policy statements and the policy framework are priority lists for projects in the Apex Transportation Plan. The project lists identify specific pedestrian and bicycle projects to help realize the Plan vision. The lists should be updated annually as projects are completed and new priorities are identified. Improvements to specific roadways are shown in **Appendix D**.

The overall recommendations are shown on the 3 Apex Transportation Plan maps: the Pedestrian, Bicycle, and Equestrian Plan, the Thoroughfare and Collector Street Plan, and the Transit Plan. These maps act as the de facto Apex Transportation Plan as they represent the overall transportation needs for the town. They are the most flexible component of the Plan and should be revised as needed to keep the Plan current.

### 5.1 General Policy Statements

#### **Increase transportation choices.**

Cars will continue to be an important part of Apex's transportation system. While recognizing that some trips will be made by car, lessening the dependence on the car for all trips is our goal. The town is planning for a more balanced transportation system by giving people viable alternatives to driving, including transit, bicycling, and walking. Providing choices in travel mode is essential for creating a sustainable and efficient transportation system.



Combining modes of travel can increase the choices in transportation modes.

Source: [www.triangletransit.org](http://www.triangletransit.org)

### **Make transit a real choice.**

Educate citizens about transit and its benefits as a reliable, safe, and convenient modal choice. Work with transit agencies (namely Triangle Transit and C-Tran) to continue existing routes and to create new service routes that connect to each other and to other modes such as bicycling and walking to increase usefulness to the whole transportation system.

### **Encourage walking and biking as an easy, healthy way to get around town.**

Construct transportation improvements that make bicycling and walking safe, attractive, easy, and convenient forms of transportation and recreation for people of all ages and abilities.

### **Maintain our infrastructure.**

Maintain our roadways, sidewalks, and off-road paths by keeping them operating safely, smoothly, and in good repair. Engage in access management strategies along major thoroughfares to increase mobility without adding additional vehicle lanes.

## *5.2 Recommended Map Guidelines*

### 5.2.1 Bicycle, Pedestrian, and Equestrian Plan

Recommendations to the Bicycle, Pedestrian, and Equestrian Plan should consider priority nearby locations such as:

- Schools
- Parks
- Neighboring communities
- High density commercial districts
- High density residential developments
- Existing easements (such as sewer easements)
- Low income communities

### 5.2.2 Thoroughfare and Collector Street Plan

Recommendations for the Thoroughfare and Collector Street Plan should include the following considerations:

- Routes parallel to roadways with high ADT
- Routes that are constructible
- Routes aligned away from floodplains, stream buffers, and steep slopes
- Routes that provide access to major new developments
- Routes that provide direct connections to highways or major thoroughfares

### 5.2.3 Transit Plan

Because the Town of Apex currently has no public transit system apart from regional systems such as Wake County TRACS and Triangle Transit, changes to the Transit Plan should be based on recommendations from these regional partners. Other recommended routes should be designed to serve mixed use areas and high density developments throughout the town.

### 5.3 Policy Framework

**Objective 1:** *Create a system of interconnected streets to improve mobility and to distribute traffic efficiently and appropriately by purpose and function.*

-----

*Action 1.1:* Adjust the Thoroughfare and Collector Street Plan map and the Bicycle, Pedestrian, and Equestrian Plan map as development occurs to determine additional future roadway or greenway connections.

*Action: 1.2* Limit cul-de-sac streets in new development, and require stub streets for new development.

*Action: 1.3* Consider a modified grid overlay for the Town to guide the design and location of future streets.

**Objective 2:** *Encourage streetscape and "built-in" traffic calming in roadway designs.*

-----

*Action 2.1:* Identify new street typical sections to supplement existing designs that integrate traffic calming (such as chicanes and mini-circles) into roadway designs.

*Action 2.2:* Create a Street Design Manual with roadway cross-section alternatives and intersection treatments to create more flexibility in choosing the appropriate street to serve an area.

**Objective 3:** *Support mixed use development to encourage walking and bicycling by promoting context-sensitive roadway design.*

-----

*Action 3.1:* Continue to review the 2025 Land Use Plan for the Town of Apex to ensure that it supports the best mix of land uses as development occurs.

*Action 3.2:* Identify projects that would be suitable for mixed-use development.

**Objective 4:** *Encourage 2-lane and 3-lane roads with street trees and plantings between roadway and development.*

-----

*Action 4.1:* Encourage landscaping immediately outside of the right-of-way in new development along roadways and greenways to enhance the transportation environment.

*Action 4.2:* Work with Public Works department to create a street typical section that provides spaces for street trees while leaving adequate room for utilities.

**Objective 5:** *Promote a pedestrian-friendly environment by filling in gaps and improving interconnectivity in the sidewalk system.*

-----  
*Action 5.1:* Identify high-priority pedestrian projects that can help complete the sidewalk network.

*Action 5.2:* Coordinate with the Parks, Recreation, and Cultural Resources Department to create a greenway network that allows people to walk both for recreation and for transportation.

**Objective 6:** *Implement roadway system improvements to accommodate growth and minimize roadway congestion.*

-----  
*Action 6.1:* Identify network-based solutions instead of facility-based solutions to accommodate growth to improve the overall network instead of relying on one facility to meet demand.

*Action 6.2:* Identify intersection improvements for intersections that operate at LOS E or worse.

*Action 6.3:* Implement complete street solutions that increase mobility for all travel modes along the most congested corridors.

**Objective 7:** *Develop a plan compatible with land use.*

-----  
*Action 7.1:* Ensure that the Apex Transportation Plan remains current and compatible with the Unified Development Ordinance by updating the plan as transportation-related changes are made to the UDO.

**Objective 8:** *Support more bike lanes and trails to parks and community activity centers.*

-----  
*Action 8.1:* Prioritize projects that support nonmotorized access to activity centers.

*Action 8.2:* Coordinate with the Parks, Recreation, and Cultural Resources Department to identify future activity centers.

**Objective 9:** *Encourage a rail system spurring Triangle Transit's plans for passenger rail service.*

-----  
*Action 9.1:* Work with Triangle Transit to find ways to accommodate the future rail system and preserve rights-of-way.

*Action 9.2:* Support transit-oriented development that provides the density necessary to sustain a transit system.

**Objective 10:** Support the use of roundabouts as gateway and traffic calming devices in local street design standards.

-----  
*Open Transportation Plan*  
Action 10.1: Identify additional locations where roundabouts would be appropriate and add them to the Thoroughfare and Collector Street Plan map.

Action 10.2: Encourage roundabouts in new development so that people can gain experience using roundabouts.

Action 10.3: Create an intersection typical section for roundabouts.

**Objective 11:** Minimize property impacts to existing homes and businesses by promoting context-sensitive roadway design.

-----  
Action 11.1: Consider the overall transportation objective when siting new roads and paths.

Action 11.2: Work with property owners to determine the best way to minimize the impact of new facilities on existing properties and buildings.

#### 5.4 Infrastructure Priorities

##### 5.4.1 Pedestrian and Bicycle Improvements

Pedestrian and bicycle projects are important for expanding the transportation network for all travel modes, allowing users travel choice when moving between destinations. Because funding for transportation projects, especially projects that serve nonmotorized travel modes, is limited, prioritization of the most important projects is essential to ensure the projects that will have the greatest benefit are constructed first. The following factors should be considered when prioritizing projects:

- Proximity to pedestrian/bicycle generator
  - School
  - High Density Residential
  - Office
  - Park
- Connection to regional trails/routes
- Location along thoroughfare or collector street
- Prime connection within the transportation network
- Proximity to minority or low-income area
- Support for transportation as primary function as opposed to recreation

The priority pedestrian and bicycle projects are shown in **Table 5.1**.

Table 5.1 -- Priority Pedestrian and Bicycle Projects

Rank	Street	Project Category	Project Description	Length (feet)	Estimated Cost
1	Old Raleigh	Sidewalk	Fill gaps along Old Raleigh Road and provide a continuous route from the Town Campus to the Eva Perry Library	3,400	\$312,000
2	Center	Sidewalk	Fill sidewalk gaps on Center Street from Seagroves Farm Subdivision into downtown Apex	2,600	\$209,000
3	Thompson	Multi-use path	Thompson Street pedestrian connection to Town Hall	300	\$24,000
4	N. Salem	Sidewalk	Fill sidewalk gaps along N. Salem Street from Center Street to Thompson Street	330	\$27,000
5	Tingen	Sidewalk	Construct sidewalk along Tingen Road from Apex Elementary School to West Haven	420	\$34,000
6	Apex Barbecue	Sidewalk	Construct sidewalk along Apex Barbecue Road from Town Side Drive to Evans Road	7,250	\$580,000
7	James	Sidewalk	Connect sidewalk on eastern end of James Street to NC 55	730	\$59,000
8	Tingen	Sidewalk	Fill sidewalk gaps along Tingen Road from Peace Haven to James Street (separated from small section next	2,500	\$202,000
9	White Dogwood	Sidewalk	Fill in sidewalk gap along White Dogwood Road from east of Big Leaf Loop to Keppoch Court	180	\$15,000
10	Ten Ten	Sidewalk	Fill Ten Ten Road sidewalk gap between Avalon Peaks Apartments and South Chase subdivision	670	\$54,000
11	Kelly	Sidewalk	Fill in sidewalk gap along Kelly Road toward Abbing-ton subdivision	1,200	\$110,000
12	Watersglen	Sidewalk	Fill in sidewalk gap along Watersglen Drive from Fordcrest Drive to Waterford East	470	\$38,000
13	Hillcrest	Sidewalk	Construct sidewalk along Hillcrest Road from Hunter Street to Apex Peakway	1,890	\$183,000
14	NC 55	Sidewalk	Fill in sidewalk gap along E. Williams Street/NC 55 from Straywhite Avenue north (part on old railroad ROW) to E. Williams Street	2,400	\$193,000
15	Laura Duncan	Sidewalk	Complete Apex High School sidewalk connections on the east side of Laura Duncan Road (north and south of Knollwood Drive)	1,200	\$97,000

### 5.4.2 Roadway Improvements

In order to meet the future travel demands of Apex, significant changes to the current transportation network will be required. The comprehensive collection of roadway improvements planned for Apex are shown on the Thoroughfare and Collector Street Plan and Bicycle, Pedestrian, and Equestrian Plan maps (see **Appendices A, and B**). Recommendations for specific roadways can be found in **Appendix D**. Because funding is not available for all of these projects and many can be completed as development occurs, a priority list of improvements is necessary to allow the most crucial projects to be completed in a timely manner.

Priority factors for town-funded roadway improvements include:

- Unsafe locations (crash data)
- High congestion areas (ratio of volume to capacity)
- Proposed facilities through areas unlikely to be redeveloped

The current roadway and intersection project priorities are shown in **Table 5.2**.

Table 5.2 -- Roadway and Intersection Project Priorities

Roadway Name	Improvement Type	Priority	Estimated Cost
Apex Peakway	New construction/widening	High	\$16,500,000
Lufkin Rd	Intersection realignment	High	\$1,100,000
Pate St (from Hunter St. to Cash St)	Widening	High/Medium	\$250,000
Tunstall St (from NC 55 to Ten Ten Rd)	Widening	High/Medium	\$400,000
Hughes St & NC 55	Intersection improvement	High/Medium	\$350,000
NC 55 (Olive Chapel Rd to Salem St)	Widening	High/Medium	\$1,000,000
Ten Ten Rd (from US 1 to Apex Pewy)	Widening	Medium	\$1,000,000
US 64 & Laura Duncan Rd	Superstreet <sup>1</sup>	Low	\$1,000,000
US 64 & Lake Pine Dr	Superstreet	Low	\$1,000,000
Tingen Rd (with Lynch St)	Intersection realignment	Low	\$250,000
Holland Rd (with Friendship Rd)	Intersection realignment	Low	\$250,000
Horton Rd (with Shearon Harris Rd)	Intersection realignment	Low	\$250,000
Hinsley Rd (with Bosco Rd)	Intersection realignment	Low	\$250,000
Old Holly Springs Apex Rd (with future Jessie Dr)	Intersection realignment	Low	\$250,000
Old Holly Springs Apex Rd (with Old Smithfield Rd)	Intersection realignment	Low	\$250,000

<sup>1</sup> - On a superstreet, select left turns are removed from intersections to improve traffic operations.

General road improvements that affect specific roadway types include:

- Thoroughfares
  - All proposed and improved thoroughfares will include sidewalks or multi-use paths on both sides of the road.
  - All proposed and improved thoroughfares will include wide outside lanes for bicycles.
- Collectors
  - All proposed and improved collectors will include sidewalks or multi-use paths on both sides of the road.
  - All proposed collector streets will include sidewalks on both sides and wide outside lanes for bicycles.
  - Major collectors prohibit direct access by residential driveways.
- Grade-separated facilities
  - All proposed and improved bridges and tunnels will include appropriate facilities for pedestrians and bicycles.
- Intersections
  - All proposed traffic signals will include pedestrian push buttons and pedestrian signal heads for intersection legs with crosswalks.
  - All improved traffic signals with adjacent sidewalks will include pedestrian push buttons and pedestrian signal heads along the routes served by the sidewalks.

#### 5.4.3 Transit Improvements

As the Triangle area continues to grow, transit will begin to play an increasingly important role in ensuring regional mobility. New or improved roadways that provide only for automobile travel will not be able to create adequate mobility for the citizens of Apex and the surrounding communities. Likewise low development densities that do not support transit act as a barrier to increased mobility. Generally a minimum residential density of 4-5 dwelling units per acre are required for local bus service to be effective (see **Table 5.3**). For a map of existing residential densities see **Figure 5.1**.

Table 5.3 - Minimum Density for Transit Service

Type of Service	Frequency (buses/trains per hour)	Minimum Density (dwelling units per acre)
Minimal local bus	1	4-5
Intermediate local bus	2	7
Frequent local bus	6	15
Light rail	6	9-12
Commuter rail	1	1-2*

\* Commuter rail is suitable for low residential densities as long as the destination has a concentration of non-residential development exceeding 100 million square feet.

Source: "A Toolbox for Alleviating Traffic Congestion"

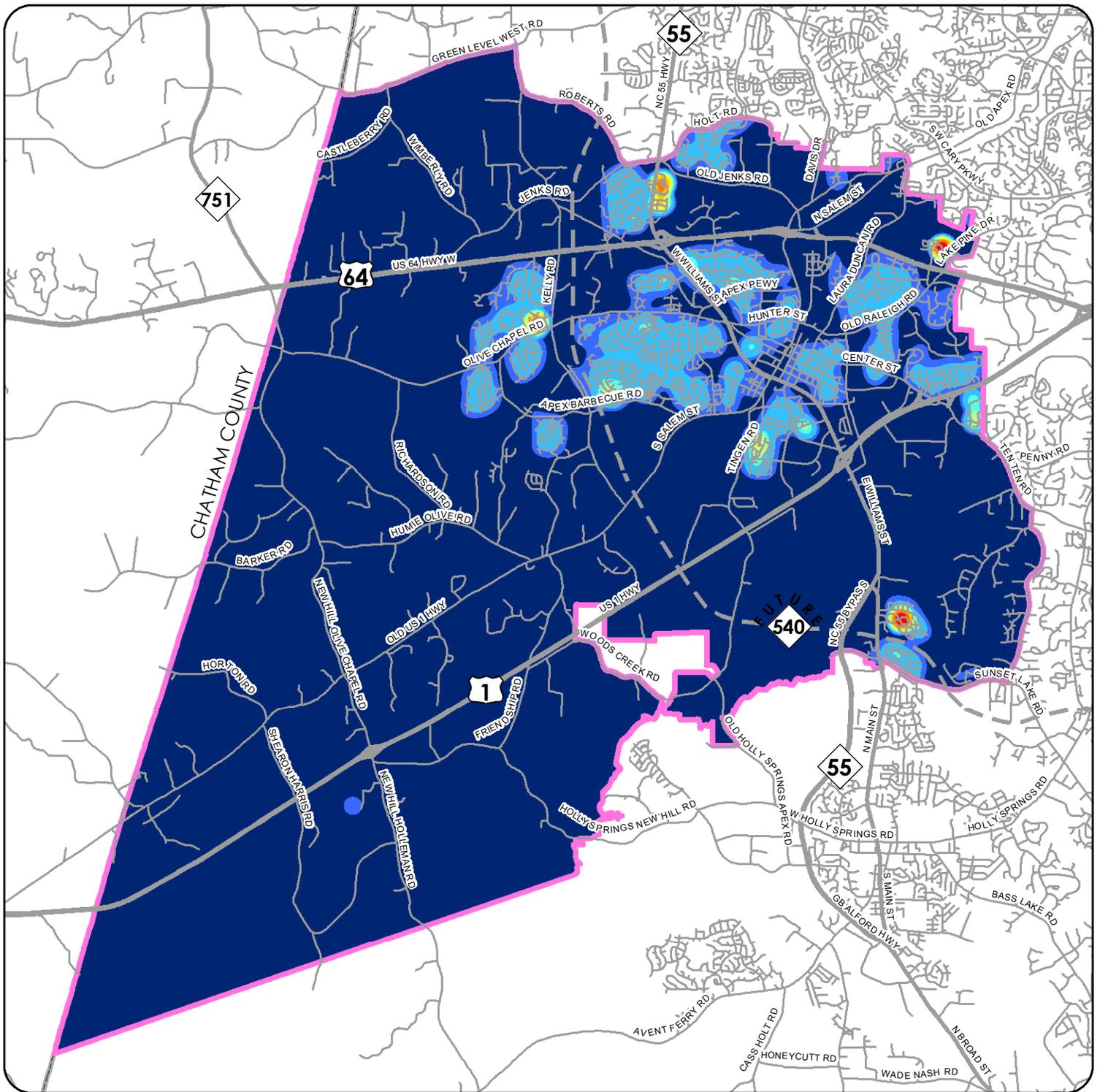
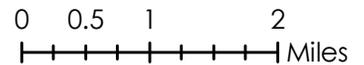


Figure 5.1  
Existing Residential  
Density



# Apex Transportation Plan

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### *Local Transit*

To date, support for local transit service is limited predominantly to those who are unable to drive. As support increases, the following steps should be conducted to determine the feasibility of providing this service:

- Conduct transit service workshops
  - Hold workshops in different areas of town
  - Target populations that are unable to drive
  - Identify key transit destinations
  - Prioritize routes and times
  - Determine an acceptable fee schedule for the service
- Formulate route alternatives
  - Use the information to determine the most efficient route to address the needs identified in the workshop
  - Identify appropriate times, headways, and fees for the service
- Conduct secondary transit workshop
  - Present the proposed route(s) and receive comments
- Determine price for service
  - Contact existing transit providers such as C-Tran and Capital Area Transit (CAT) to determine costs to provide service
- Identify funding sources
  - Coordinate with Capital Area MPO and Triangle Transit to find grants to supplement local funds
- Determine feasibility of providing service

After completing this process, the Town can decide whether to implement service. Each of the steps will help to ensure that if transit service is initiated in Apex, it is efficient and worthwhile to patrons who wish to use it.

### *Regional Transit*

In order to plan for future transit options in the Triangle, area leaders formed the Special Transit Advisory Commission (STAC) to study options available to the region. From May 2007 through April 2008, this 38-member citizen group met to determine the future transit needs for the region and to make recommendations to the Triangle metropolitan planning organizations for future transit services.

In order to ensure that Apex can be integrated into any future transit plans, town officials should work with regional transit officials at Triangle Transit to determine ways that Apex can be included in any plans. Specific ways in which the town can prepare for future regional transit include:

- Preparing strategic corridors for transit service
  - Provide room for transit stops along the corridors
  - Restrict access to allow for increased transit efficiency
- Encouraging transit oriented development, especially within identified transit centers
- Locate appropriate areas for transit service within the future activity centers identified in the Comprehensive Plan and the 2025 Land Use Plan.

For strategic corridors and the locations of potential transit centers, see the Transit Plan in **Appendix C**.



## 6.0 Implementation

### 6.1 Implementation and Funding

There is no particular implementation schedule or dedicated funds for the applications of this Plan. As a result, completion of the Plan will rely largely on development-driven projects. Implementation of individual projects within the Apex Transportation Plan can be funded through general funds as determined in the Capital Improvement Program. Priority should be given to those projects as listed in Table 5.1 and Table 5.2.

Some funding sources that can be considered for transportation projects include:

- **Sidewalk bonds** - municipal bonds issued specifically for sidewalk construction
- **CDBG (Community Development Block Grant)** - a program administered by the US Department of Housing and Urban Development that provides funding for projects that benefit low- and moderate- income areas through construction of public facilities such as sidewalks
- **MTIP (Metropolitan Transportation Improvement Program)** - projects added to the MTIP can be funded through the Capital Area MPO as money becomes available
- **CIP (Capital Improvement Program)** - this municipal improvement program can be used to prioritize transportation projects
- **SRTS (Safe Routes to School)** - the infrastructure components of this program can be used to construct pedestrian/bicycle facilities around schools
- Transportation Enhancements
- **CMAQ (Congestion Mitigation and Air Quality)** - because Apex is in a nonattainment zone for air quality regulations, the town is eligible to use CMAQ funds for projects that reduce congestion and improve air quality
- **JARC (Job Access Reverse Commute)** - JARC funds can be used to help fund transit service that would connect Apex with Raleigh
- **NHS (National Highway System)** - the only roads eligible for NHS funding are US 64, US 1, and NC 540
- **STP (Surface Transportation Program)** - these federal funds are distributed through CAMPO through the MTIP priority process

## 6.2 Update Process

Because there is no timetable for completion, the Apex Transportation Plan is intended to be a living document. As recommendations in the plan are implemented, other needs may be identified and added to the plan. The parts of the plan that are most easily updated are the plan maps: Bicycle, Pedestrian, and Equestrian Plan map; Thoroughfare and Collector Street Plan map and Transit Plan map. These plan maps should be updated through consideration by the Planning Board and approval by the Town Council as opportunities are identified. The Apex Transportation Plan document should be updated every 5 years in order to ensure that the information within it is accurate and current.

### 6.3 Policy Timeline

*Action 1.1:* Adjust the Thoroughfare and Collector Street Plan map and the Bicycle, Pedestrian, and Equestrian Plan map as development occurs to determine additional future roadway or greenway connections.

On-going

*Action: 1.2* Limit cul-de-sac streets in new development, and require stub streets for new development.

On-going

*Action: 1.3* Consider a modified grid overlay for the Town to guide the design and location of future streets.

1 year

-----  
*Action 2.1:* Identify new street typical sections to supplement existing designs that integrate traffic calming (such as chicanes, mini-circles) into roadway designs.

2-3 years

*Action 2.2:* Create a Street Design Manual with roadway cross-section alternatives and intersection treatments to create more flexibility in choosing the appropriate street to serve an area.

4-5 years

-----  
*Action 3.1:* Continue to review the 2025 Land Use Plan for the Town of Apex to ensure that it supports the best mix of land uses as development occurs.

On-going

*Action 3.2:* Identify projects that would be suitable for mixed-use development.

On-going

-----  
*Quality Transportation Plan*  
Action 4.1: Encourage landscaping immediately outside of the right-of-way in new development along roadways and greenways to enhance the transportation environment.

1 year (UDO amendment)/On-going

Action 4.2: Work with Public Works department to create a street typical section that provides spaces for street trees while leaving adequate room for utilities in special districts.

Complete

-----  
Action 5.1: Identify high-priority pedestrian projects that can help complete the sidewalk network.

On-going

Action 5.2: Coordinate with the Parks, Recreation, and Cultural Resources Department to create a greenway network that allows people to walk both for recreation and for transportation.

On-going

-----  
Action 6.1: Identify network-based solutions instead of facility-based solutions to accommodate growth to improve the overall network instead of relying on one facility to meet demand.

2-3 years

Action 6.2: Identify intersection improvements for intersections that operate at LOS E or worse.

On-going

Action 6.3: Implement complete street solutions that increase mobility for all travel modes along the most congested corridors.

On-going  
-----

*Apex Transportation Plan*  
*Apex Transportation Plan*  
*Apex Transportation Plan*  
Action 7.1: Ensure that the Apex Transportation Plan remains current and compatible with the Unified Development Ordinance by updating the plan as transportation-related changes are made to the UDO.

On-going

-----  
Action 8.1: Prioritize projects that support nonmotorized access to activity centers.

1 year

Action 8.2: Coordinate with the Parks, Recreation, and Cultural Resources Department to identify future activity centers.

On-going

-----  
Action 9.1: Work with Triangle Transit to find ways to accommodate the future rail system and preserve rights-of-way.

1-2 years

Action 9.2: Support transit-oriented development that provides the density necessary to sustain a transit system.

On-going

-----  
Action 10.1: Identify additional locations where roundabouts would be appropriate.

1 year

Action 10.2: Encourage roundabouts in new development so that people can gain experience using roundabouts.

On-going

Action 10.3: Create an intersection typical section for roundabouts.

2-3 years

-----  
Action 11.1: Consider the overall transportation objective when siting new roads and paths.

On-going

Action 11.2: Work with property owners to determine the best way to minimize the impact of new facilities on existing properties and buildings.

On-going

-----  
Update the Apex Transportation Plan document.

4-5 years/On-going

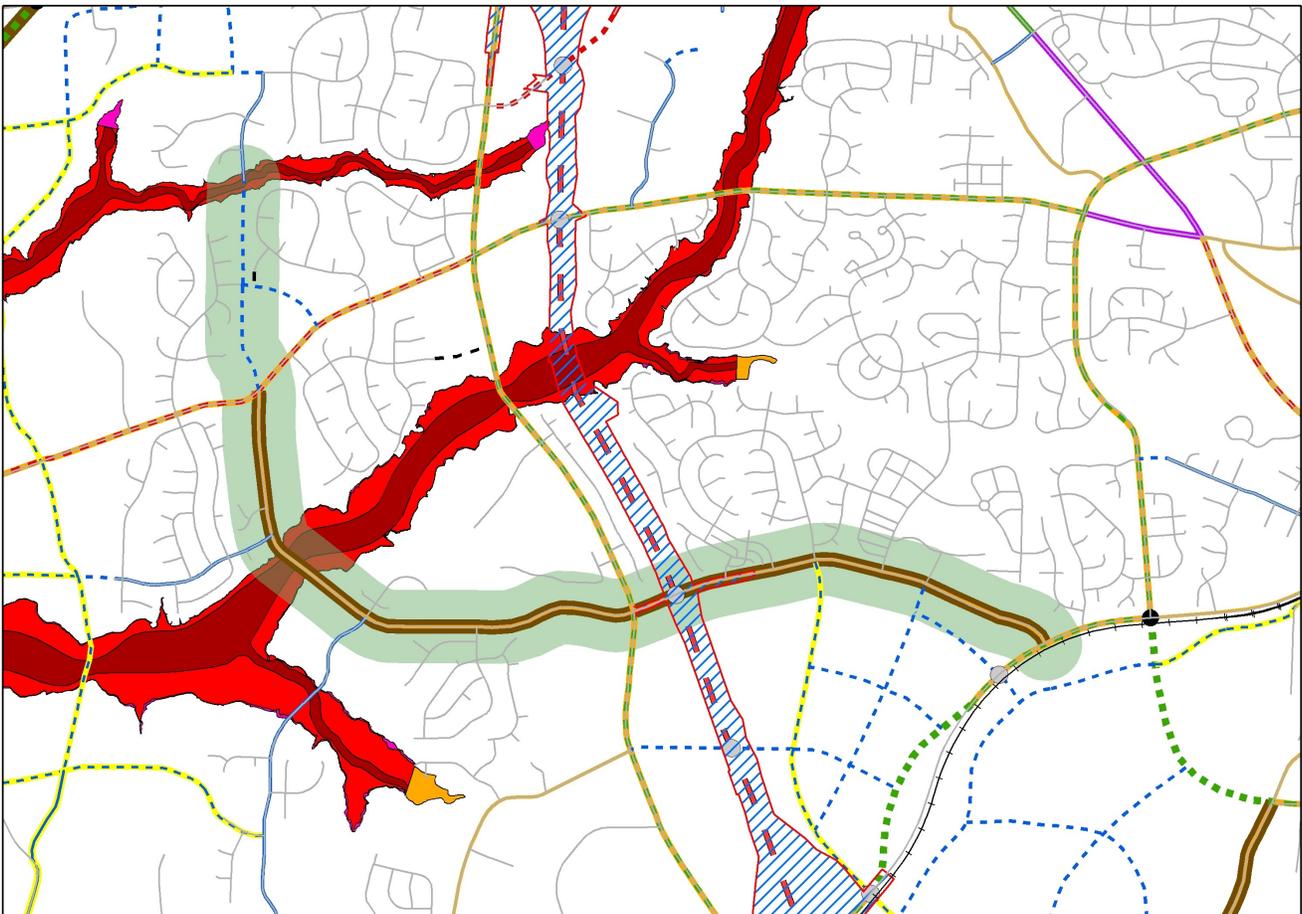
## Thoroughfare Descriptions

The following sections provide a brief explanation of the vision and purpose of each thoroughfare in the plan. The descriptions help supplement the transportation maps and create a context for the existing roadways as well as their future cross-sections and alignments.

### Apex Barbecue Road

#### ***Vision and Purpose***

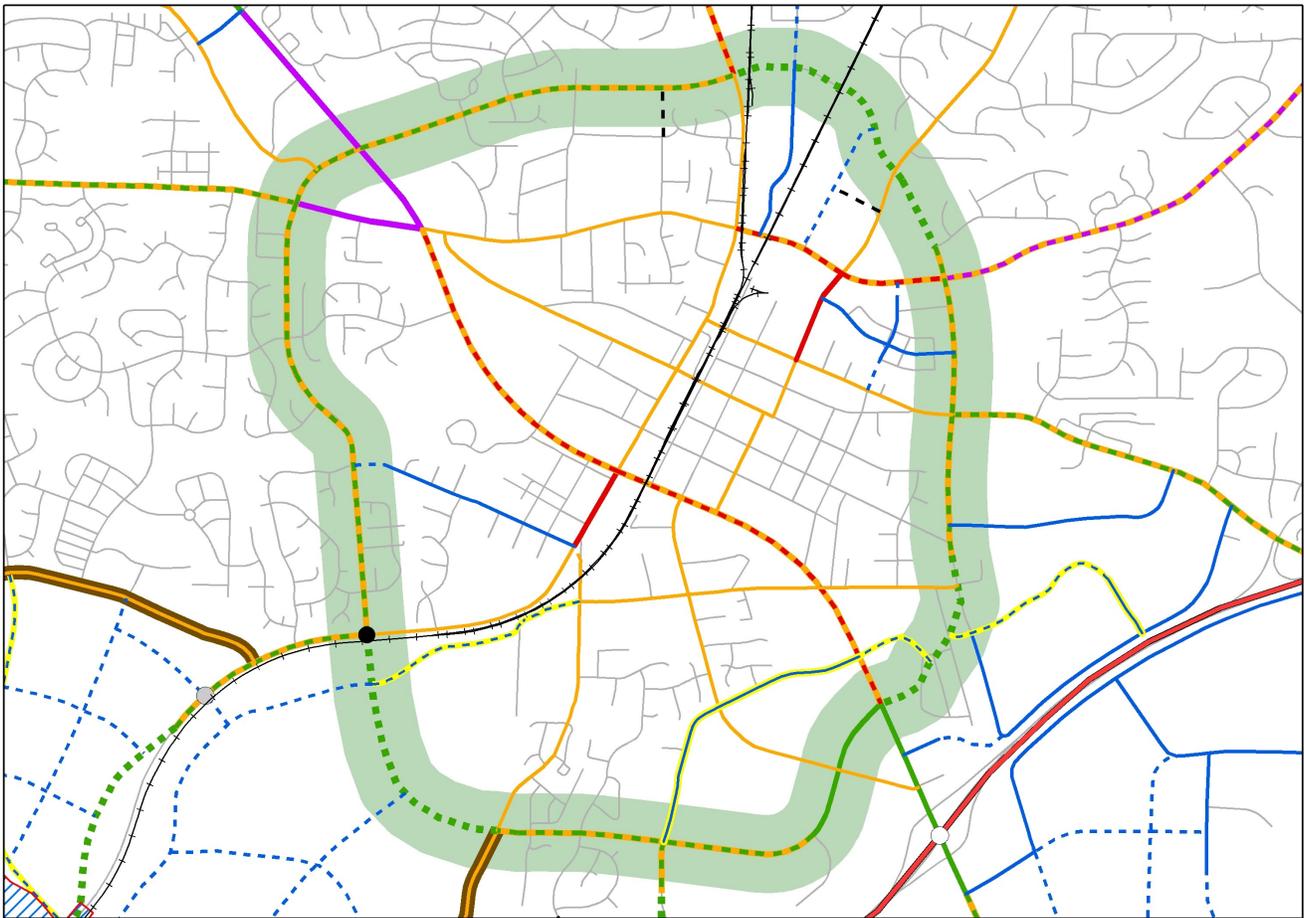
Apex Barbecue Road is an iconic thoroughfare in Apex. It serves as a rural connection between Olive Chapel Road and South Salem Street accessing the Scott's Mill neighborhood and the Apex Nature Park. Additionally it crosses Kelly Road midway between Olive Chapel Road and South Salem Street and provides bridges over Beaver Creek and NC 540. A future extension of Apex Barbecue Road will connect the Abbington neighborhood with Olive Chapel Road. The road's cross-section should remain rural with right-of-way reserved to widen to a 4-lane thoroughfare in the future if necessary.



## Apex Peakway

### **Vision and Purpose**

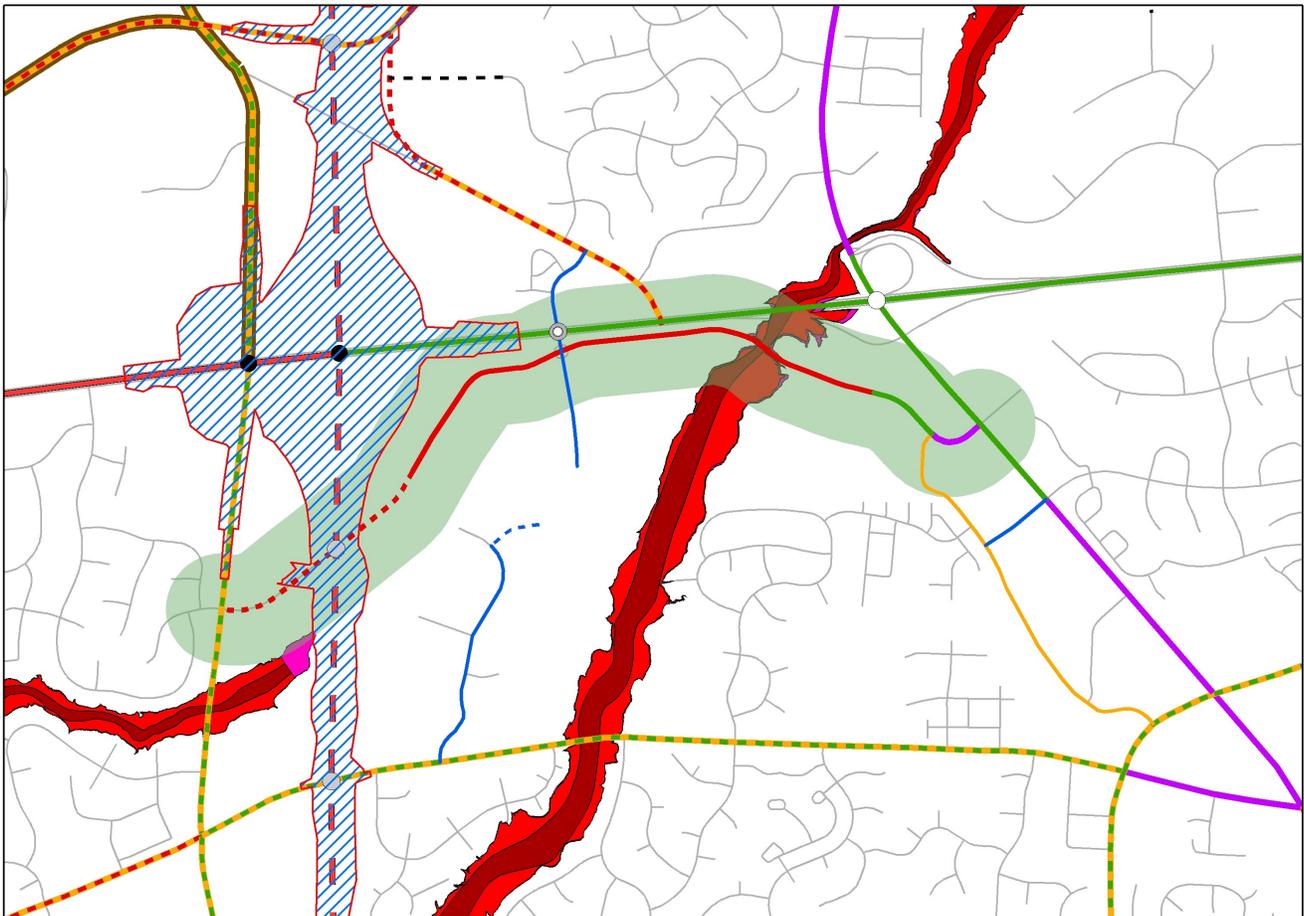
The Apex Peakway is a loop road around downtown Apex to connect other major routes including NC 55, Salem Street, Laura Duncan Road, Old Raleigh Road, Center Street, James Street, Hughes Street, Perry Road, and Tingen Road. The Peakway will eventually provide 3 crossings of the CSX railroad tracks, including 2 grade-separated crossings. The loop connects numerous residential neighborhoods and commercial areas and was noted by members of the public as the top transportation priority at the 2011 update workshop.



## Beaver Creek Commons Drive

### **Vision and Purpose**

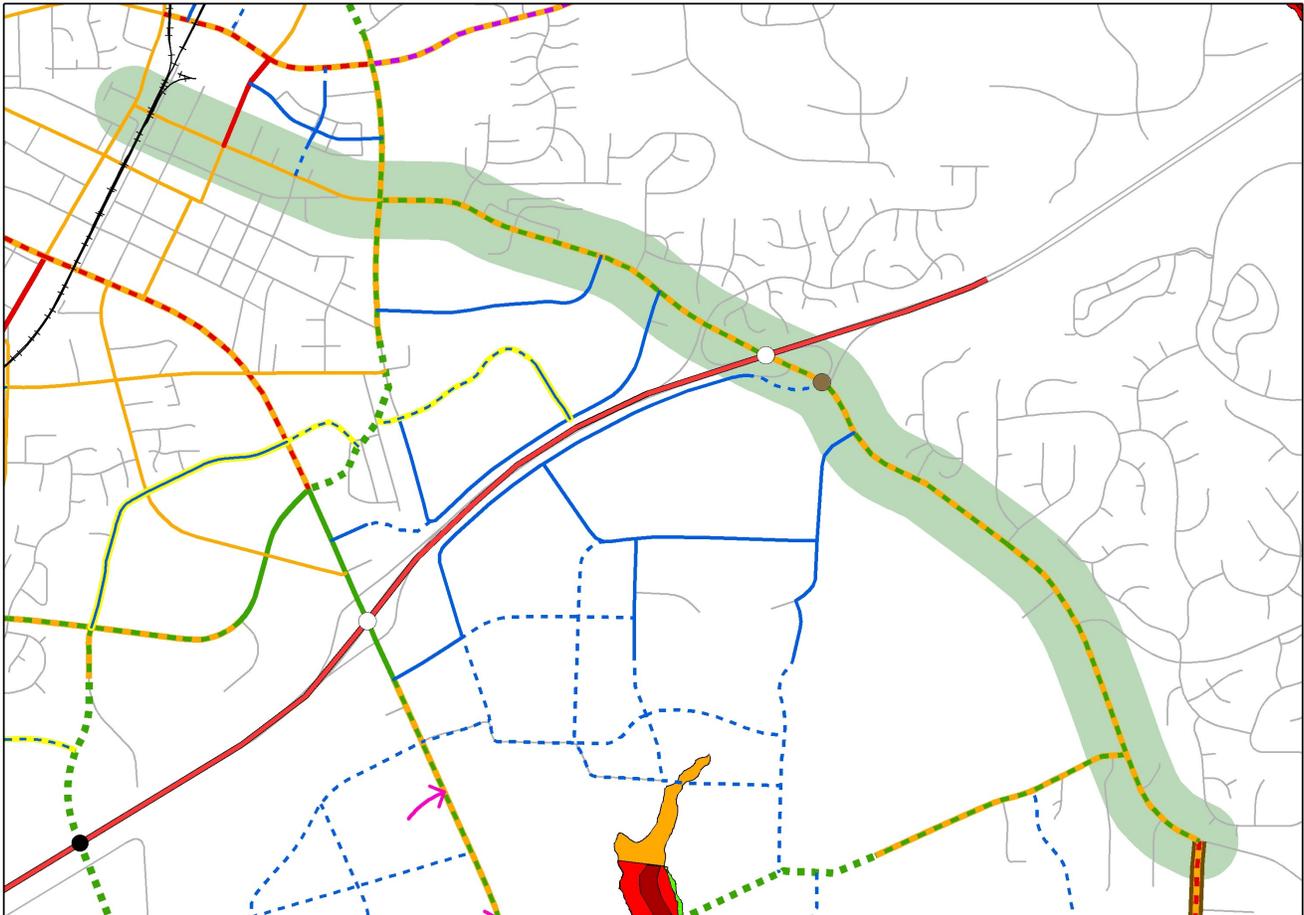
Beaver Creek Commons Drive is a minor thoroughfare serving the Beaver Creek Commons and Beaver Creek Crossings shopping centers. Once NC 540 construction is complete Beaver Creek Commons Drive will connect NC 55 with Kelly Road. It will also have a grade-separated crossing of NC 540. Because it serves a major commercial area, the road should have a 10-foot multi-use path along its length to better accommodate pedestrian traffic.



## Center Street/Ten Ten Road

### **Vision and Purpose**

Center Street/Ten Ten Road is a major commuting corridor and connection between downtown Apex and southeastern Wake County. The road carries a significant amount of traffic currently and will continue to do so in the future. With an interchange at US 1, Center Street provides a connection from Raleigh to nearby communities in Chatham and Lee counties. As a high traffic roadway that provides a direct route into the heart of Apex, Center Street should provide vehicle capacity while maintaining an active gateway into downtown.



## Chatham Street

### **Vision and Purpose**

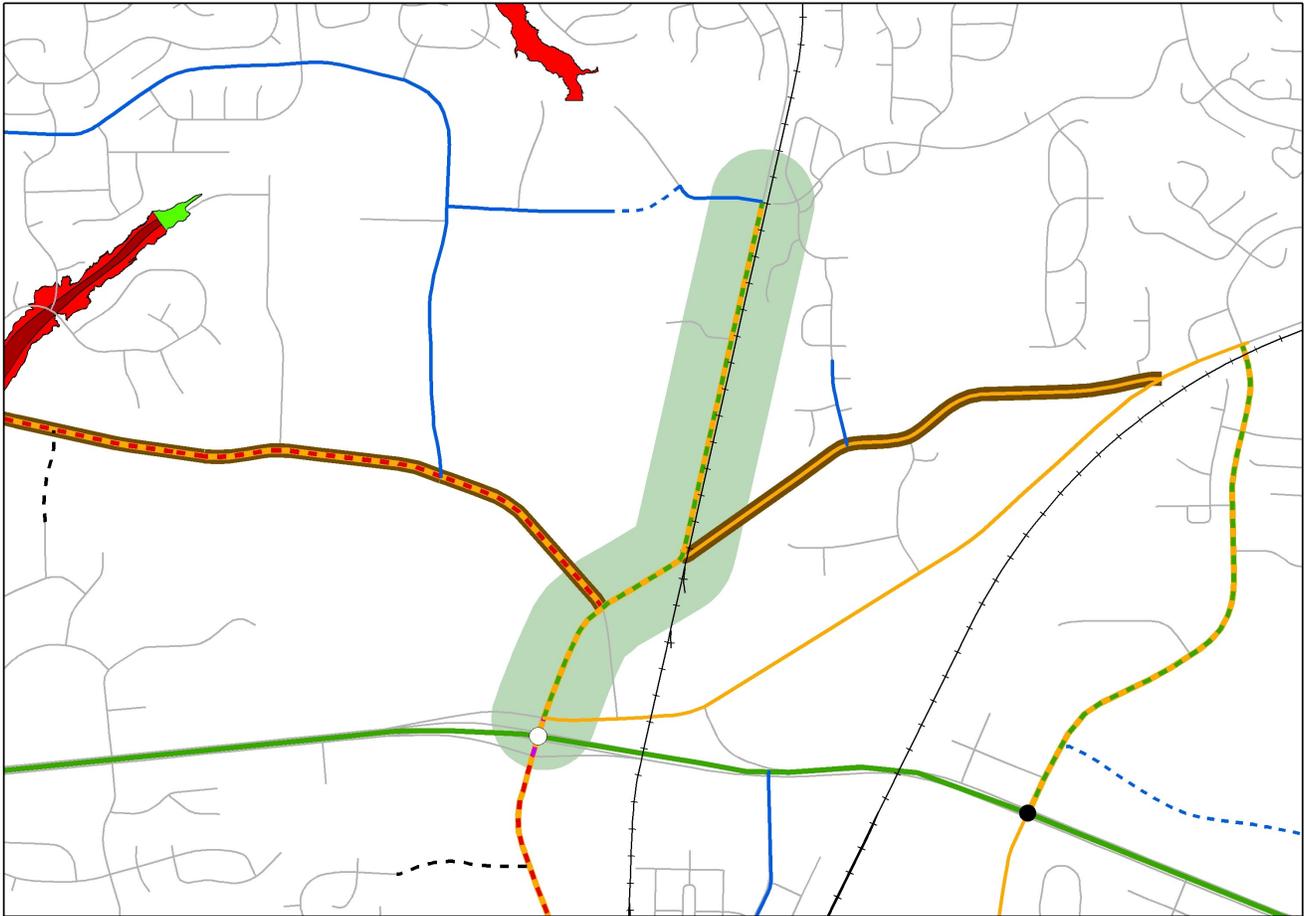
Chatham Street is a relic of the past transportation system in Apex. As part of the original NC 55, Chatham Street provides a direct route into downtown from the northwest. Because NC 55 has been relocated to its current location, Chatham Street should behave as a more local facility that maintains direct access to residential homes and accommodates pedestrian mobility around downtown.



## Davis Drive

### **Vision and Purpose**

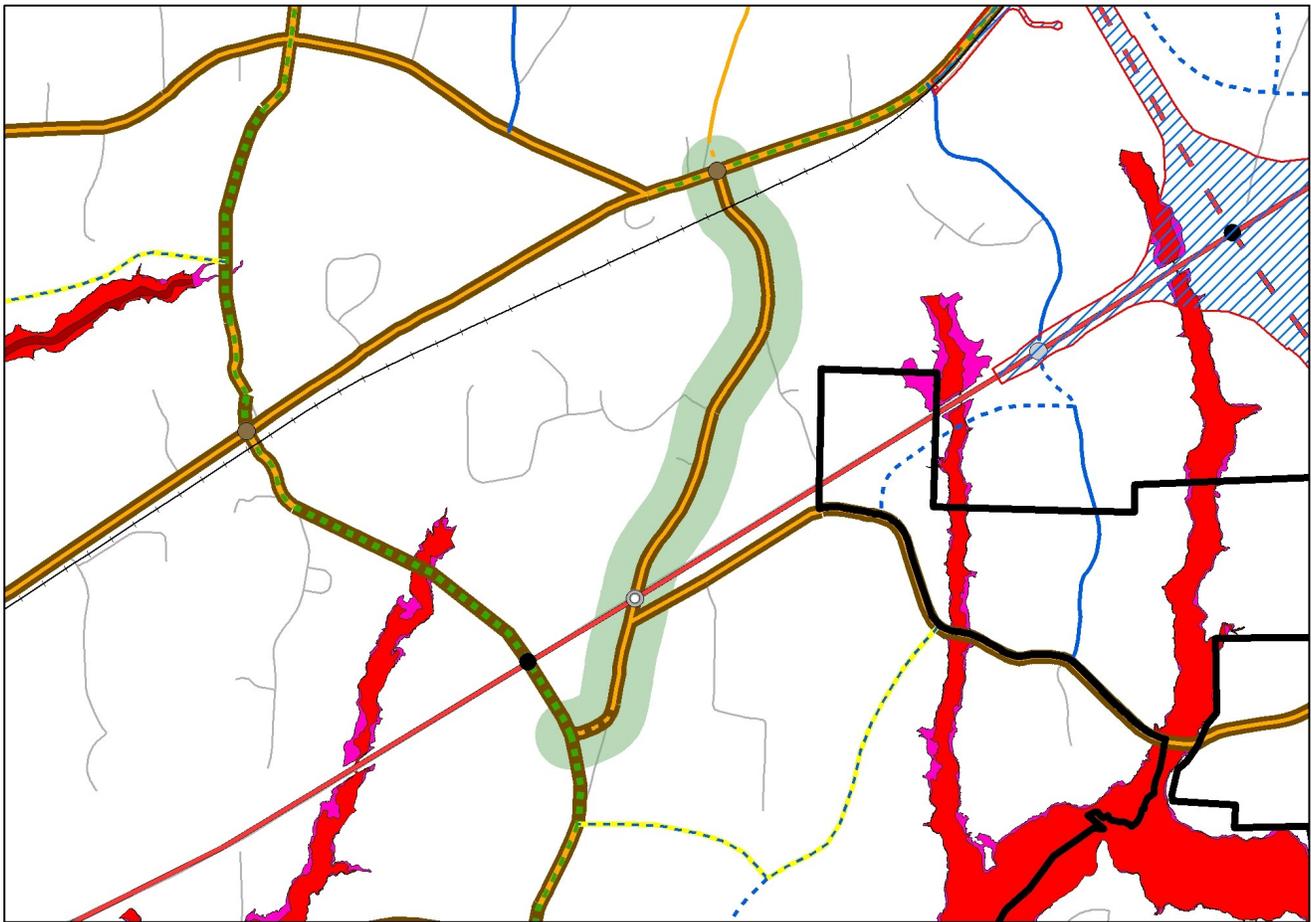
Davis Drive is a facility that connects northern Apex and neighboring Cary with US 64 and the rest of Apex. Apart from NC 55, Davis Drive is the only major thoroughfare that provides a direct connection between Apex and Research Triangle Park. As a result, the facility carries a large amount of traffic. The road parallels the CSX railroad track toward Durham and will require a context sensitive design to minimize the impact of widening on adjacent homes north of US 64.



## Friendship Road

### **Vision and Purpose**

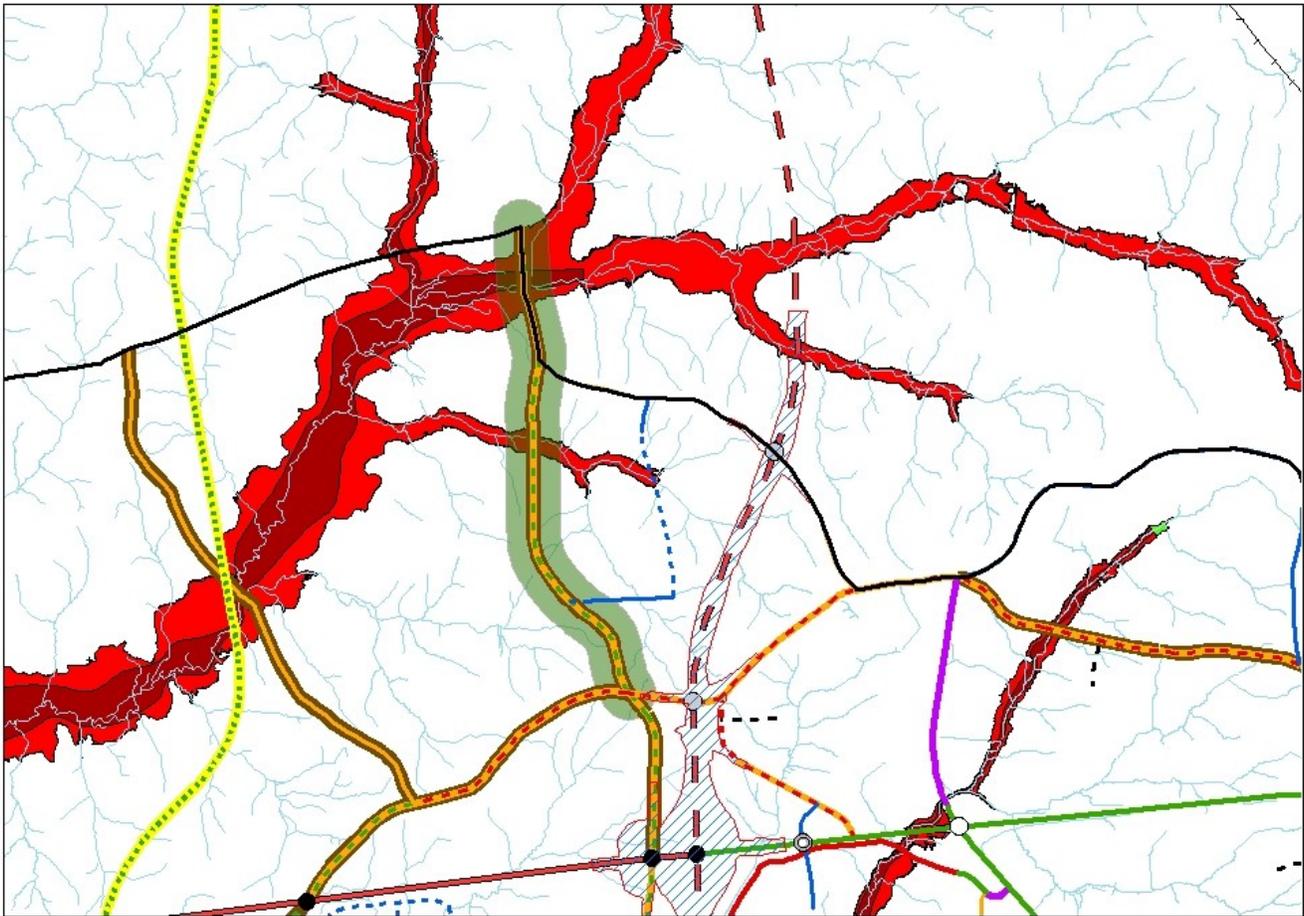
Friendship Road is a minor, rural facility serving the southwest ETJ area. It will connect the future Richardson Road extension with Old US 1 near the community of Friendship. The road provides an important crossing of the CXS railroad tracks and US 1. While minor, Friendship Road will help create better access to areas south of US 1 as Apex continues to develop. When Richardson Road is extended to the south Friendship Road will be realigned to make Richardson Road the dominant movement.



## Green Level Church Road

### **Vision and Purpose**

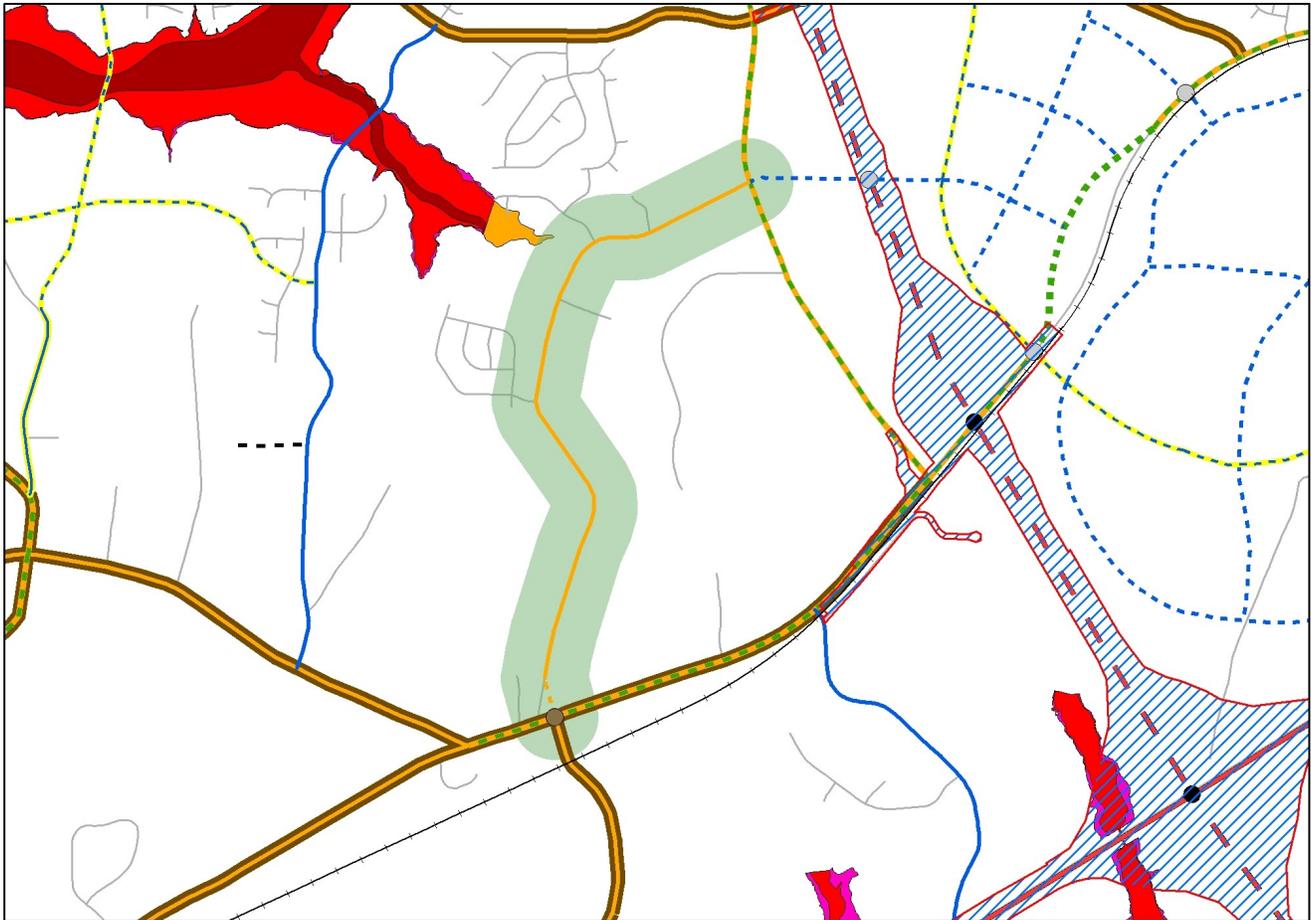
Rural in character, Green Level Church Road provides a major connection between western Cary, the historic community of Green Level, US 64, and western Apex. As an extension of Kelly Road, this facility will soon include an interchange at US 64 and indirect access to NC 540. The road will continue to see traffic demands grow as the area develops and the road acts as a free facility parallel to the toll road. Expansion of Green Level Church Road will require a design sensitive to the rural and historic nature of the area.



## Holland Road

### **Vision and Purpose**

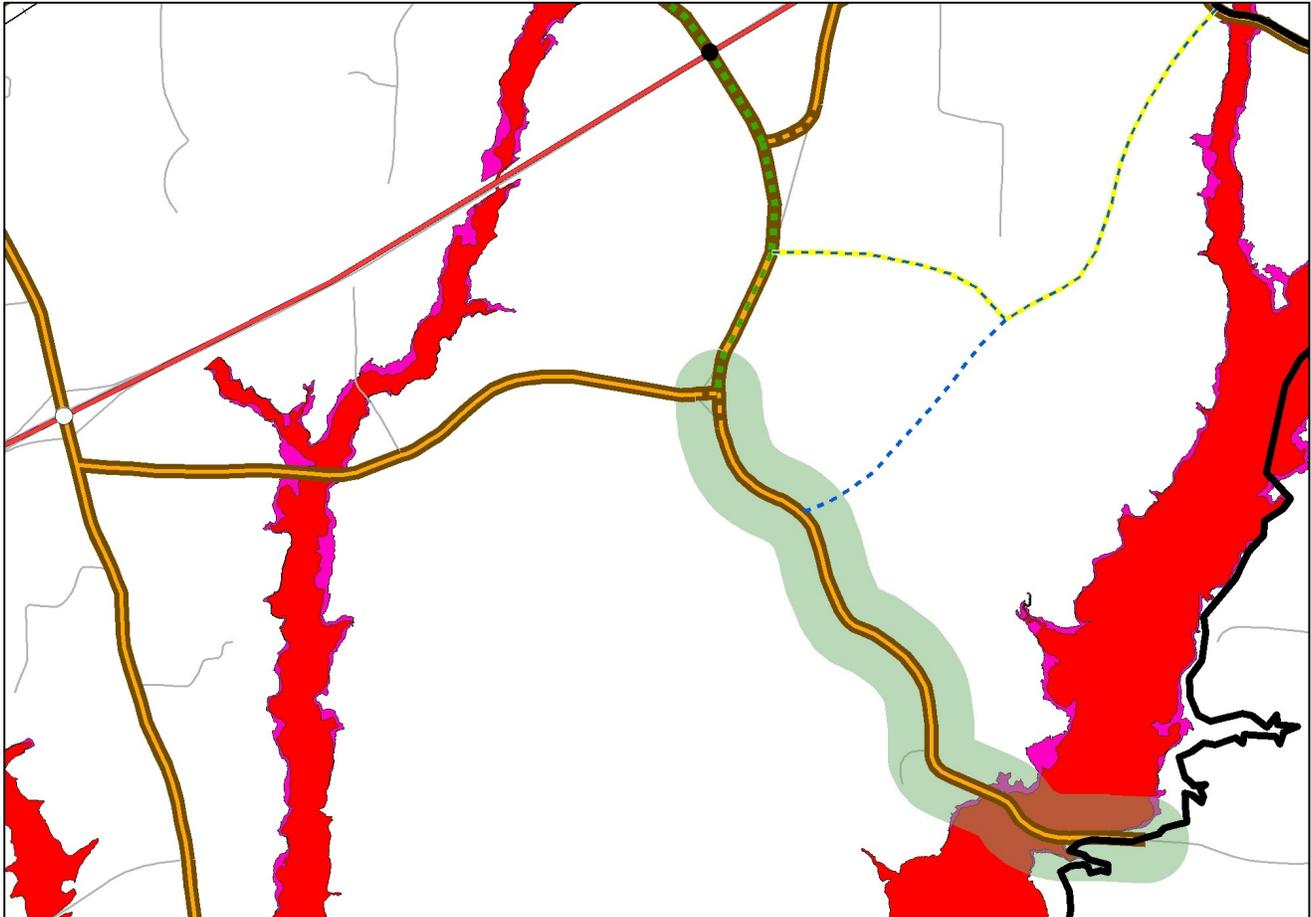
Holland Road is a minor connection between Kelly Road and Old US 1. Its proximity to the future NC 540/S Salem Street interchange will likely create demand for future redevelopment; however, because of its proximity to Kelly Road, Holland Road is unlikely to carry much more additional traffic in the future. In order to improve connectivity and safety, Holland Road should be realigned with Friendship Road to create a four-leg intersection.



## Holly Springs New Hill Road

### **Vision and Purpose**

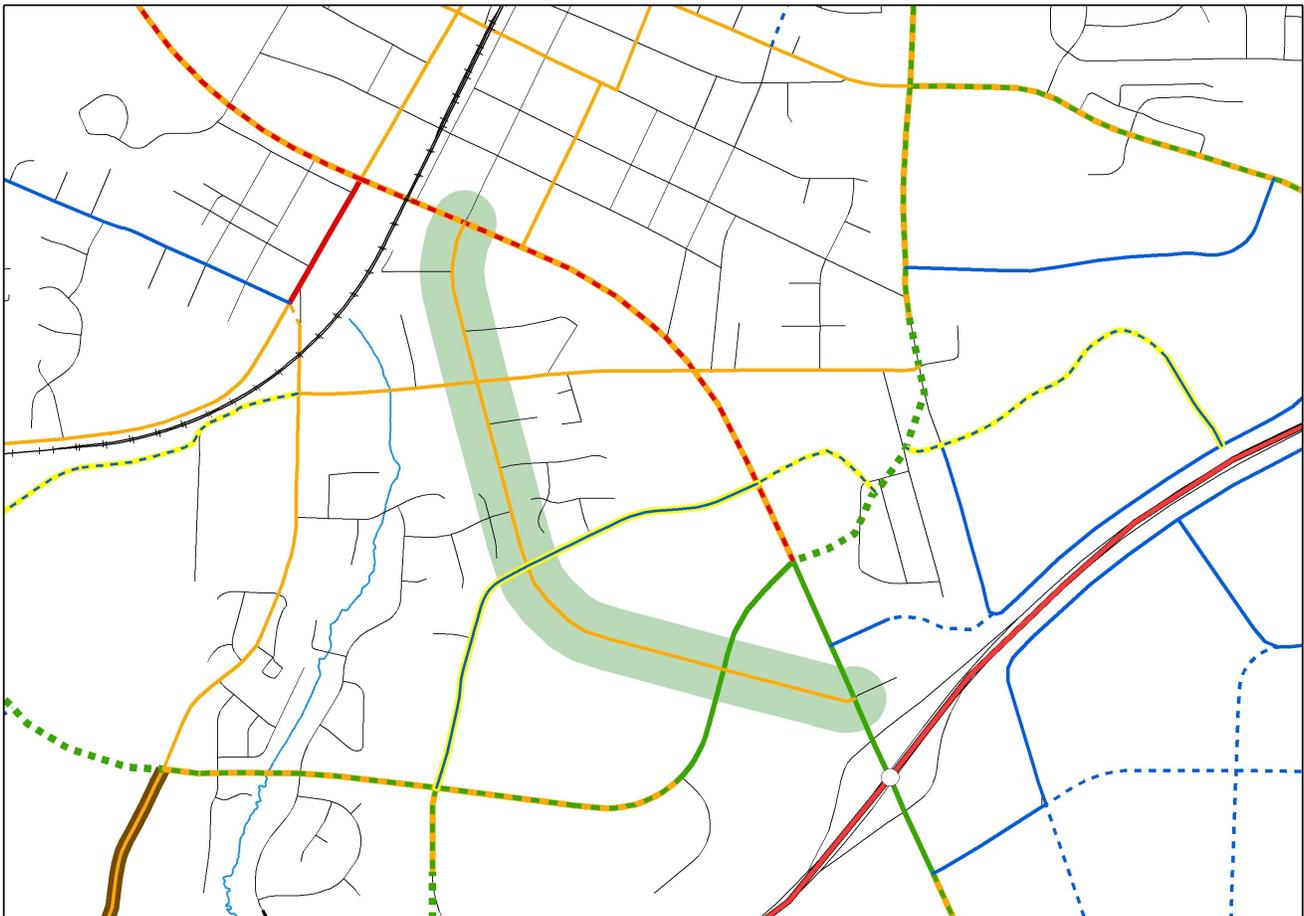
Holly Springs New Hill Road is a minor rural facility that will act primarily as a connection between Holly Springs and the Richardson Road extension. The road's proximity to Harris Lake and the Shearon Harris power plant will likely limit adjacent growth. Coordination with Holly Springs is important for determining future needs and for maintaining a consistent cross section between the jurisdictions.



## Hughes Street

### **Vision and Purpose**

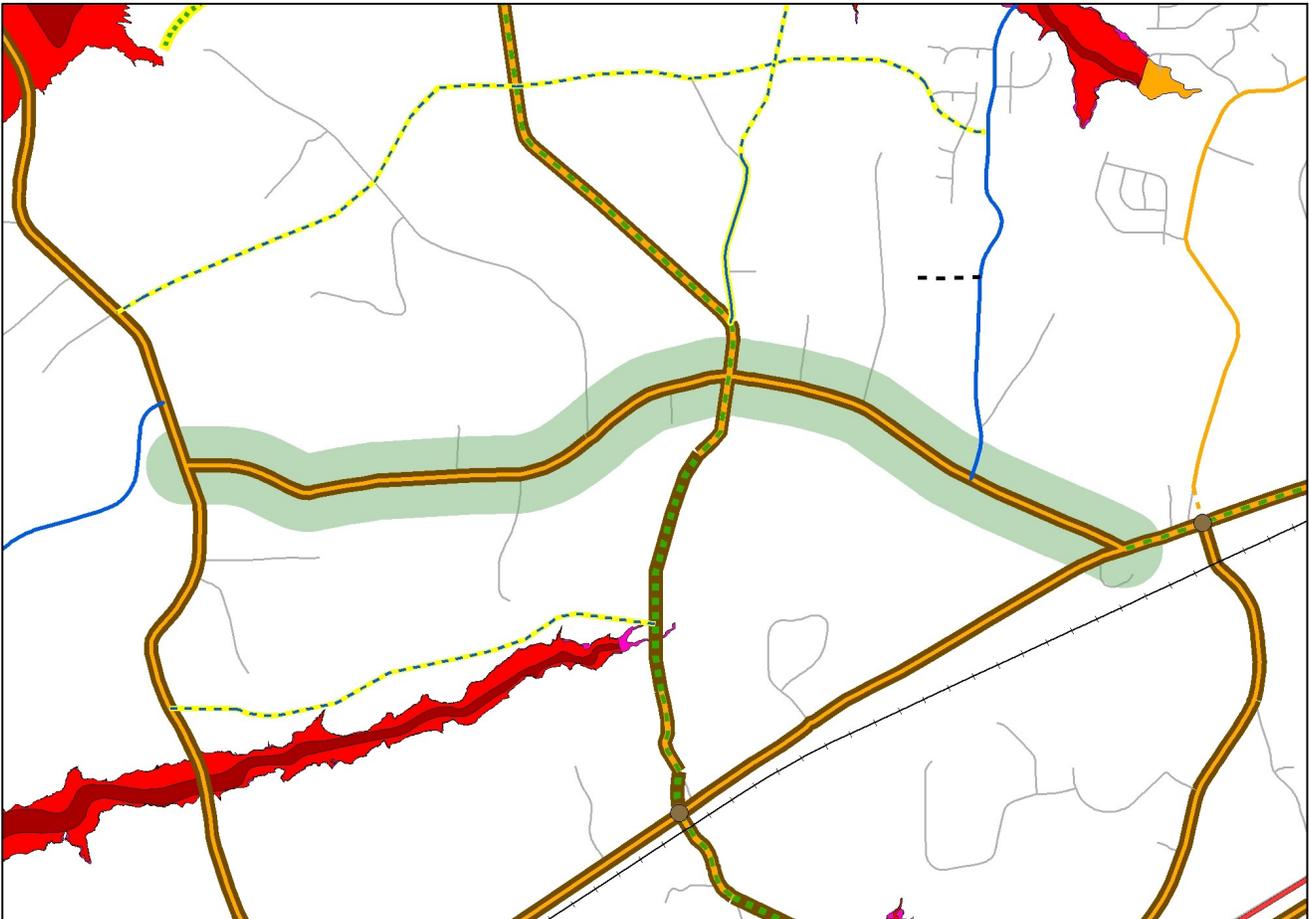
Hughes Street is a minor thoroughfare mainly providing access to the Apex Peakway. The road also serves as a local bypass for the congested portion of NC 55. Because of the proximity of NC 55 and Apex Peakway, Hughes Street will likely never carry a significant amount of traffic and therefore should be maintained as a local connection for residential uses and a pedestrian-oriented facility.



## Humie Olive Road

### **Vision and Purpose**

Humie Olive Road is a rural thoroughfare serving southwest Apex. It provides an east-west connection between Old US 1 and New Hill Olive Chapel Road. The intersection with Richardson Road will become more important in the future as Richardson Road is extended to the south. The intersection with Old US 1 is the heart of the Friendship community. The 2025 Land Use Plan calls for a possible neighborhood center at this location as well. Humie Olive Road should be preserved as a rural road to match the character of the surrounding area.



## Hunter Street

### **Vision and Purpose**

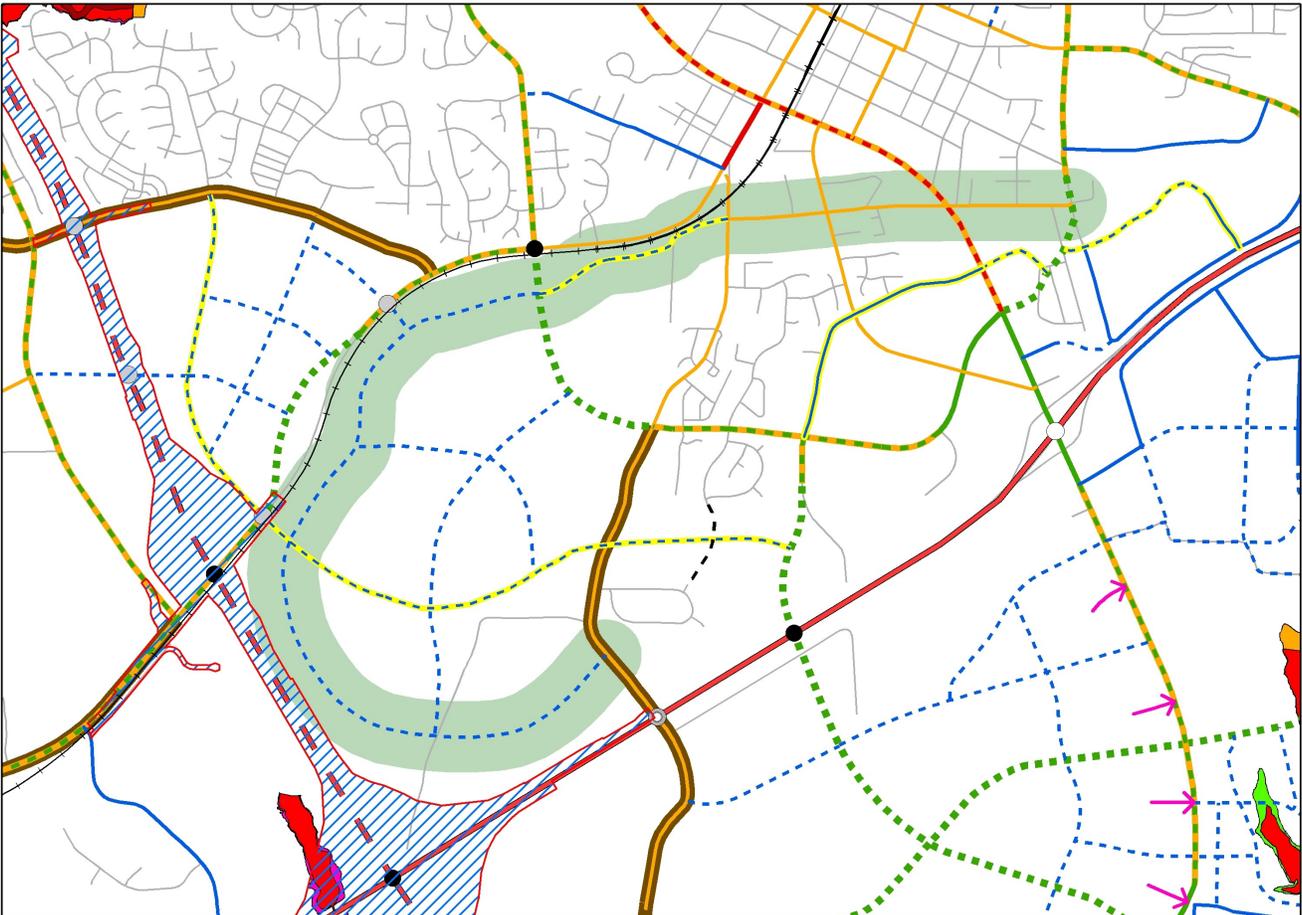
Hunter Street is the eastern continuation of Olive Chapel Road. Where it begins at NC 55 Hunter Street becomes a local street that provides residential access as well as access to Baucom Elementary School and the Apex Town Hall. Because it serves a local, more urban area, Hunter Street should accommodate a moderate amount of low-speed vehicular traffic and a moderate to high amount of pedestrian and bicycle traffic.



## James Street

### **Vision and Purpose**

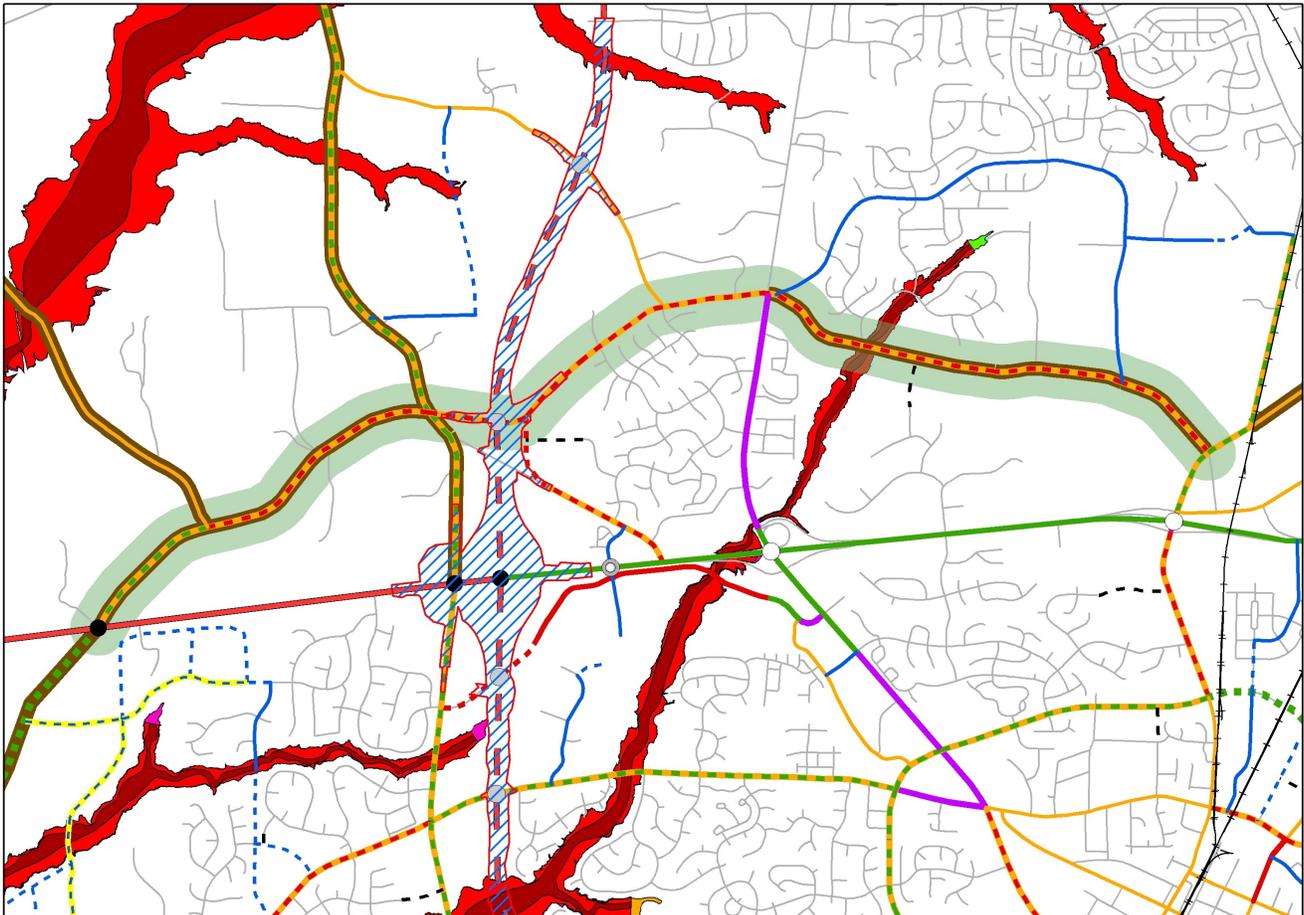
James Street is a minor connection between Tingen Road and Schieffelin Road (future Apex Peakway). It provides access to NC 55 and Hughes Street. A future extension will connect to the Apex Peakway to the west of Tingen Road and parallel the CSX railroad tracks to the south of town as shown in the 540/South Salem Street Small Area Plan. James Street provides a transition from the downtown grid to new subdivisions in southern Apex.



## Jenks Road/Old Jenks Road

### **Vision and Purpose**

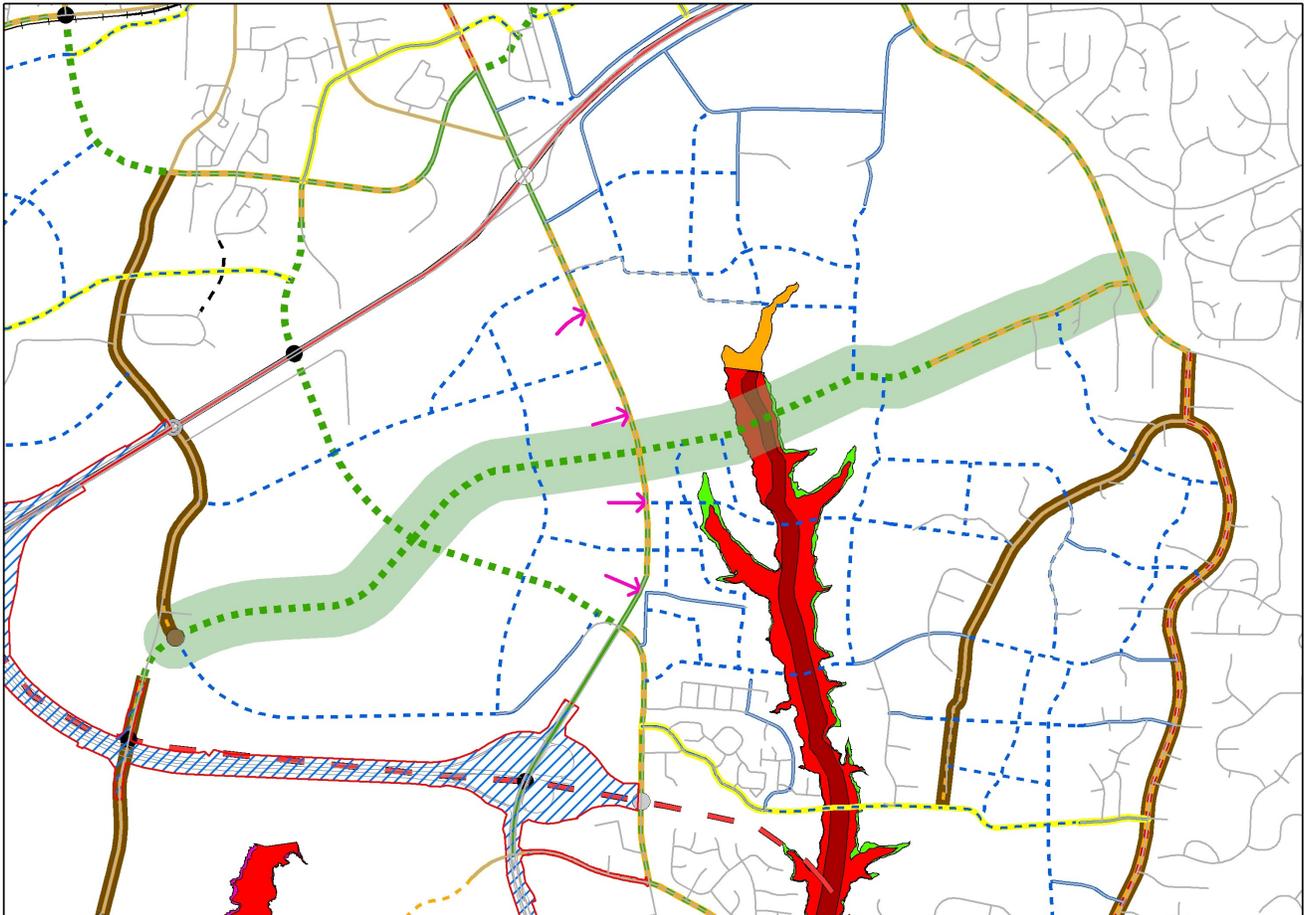
Jenks Road is a local route providing an alternative local connection along the northern portion of Apex's corporate limits connecting Davis Drive, Holt Road, NC 55, Roberts Road, Kelly Road, Wimberly Road, and US 64. The road crosses a northern fork of Beaver Creek and will provide a grade-separated crossing of NC 540. In the future, Jenks Road will serve as a major access point at US 64 with a planned interchange and extension to the south to connect to Richardson Road. Near the future interchange, Jenks Road will need to accommodate a higher volume of traffic before tapering down to a more local thoroughfare. Jenks Road and Old Jenks Road should maintain a rural feel as a transition from urban development to rural areas.



## Jessie Drive

### **Vision and Purpose**

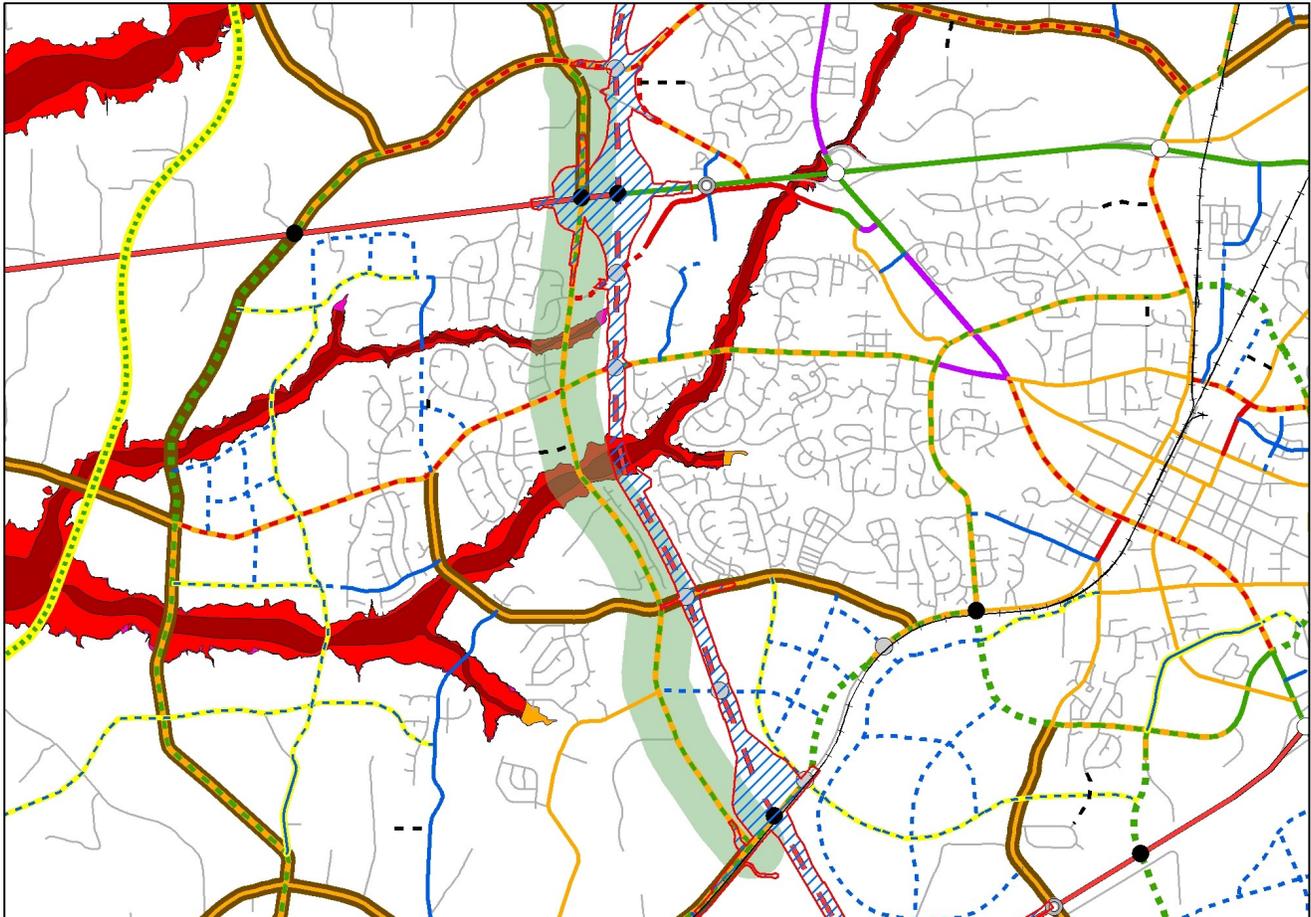
Jessie Drive is envisioned as a future major connection between NC 55 and Ten Ten Road. The connection will be critical for alleviating some congestion along NC 55 and US 1. Jessie Drive will also act as a main access point for the proposed Veridea development. To the west the road will access NC 540 via a grade-separated interchange and will cross Middle Creek between NC 55 and Jessie Drive. Because it will be designed to carry a large amount of vehicular traffic, Jessie Drive should be a multi-lane facility.



## Kelly Road

### **Vision and Purpose**

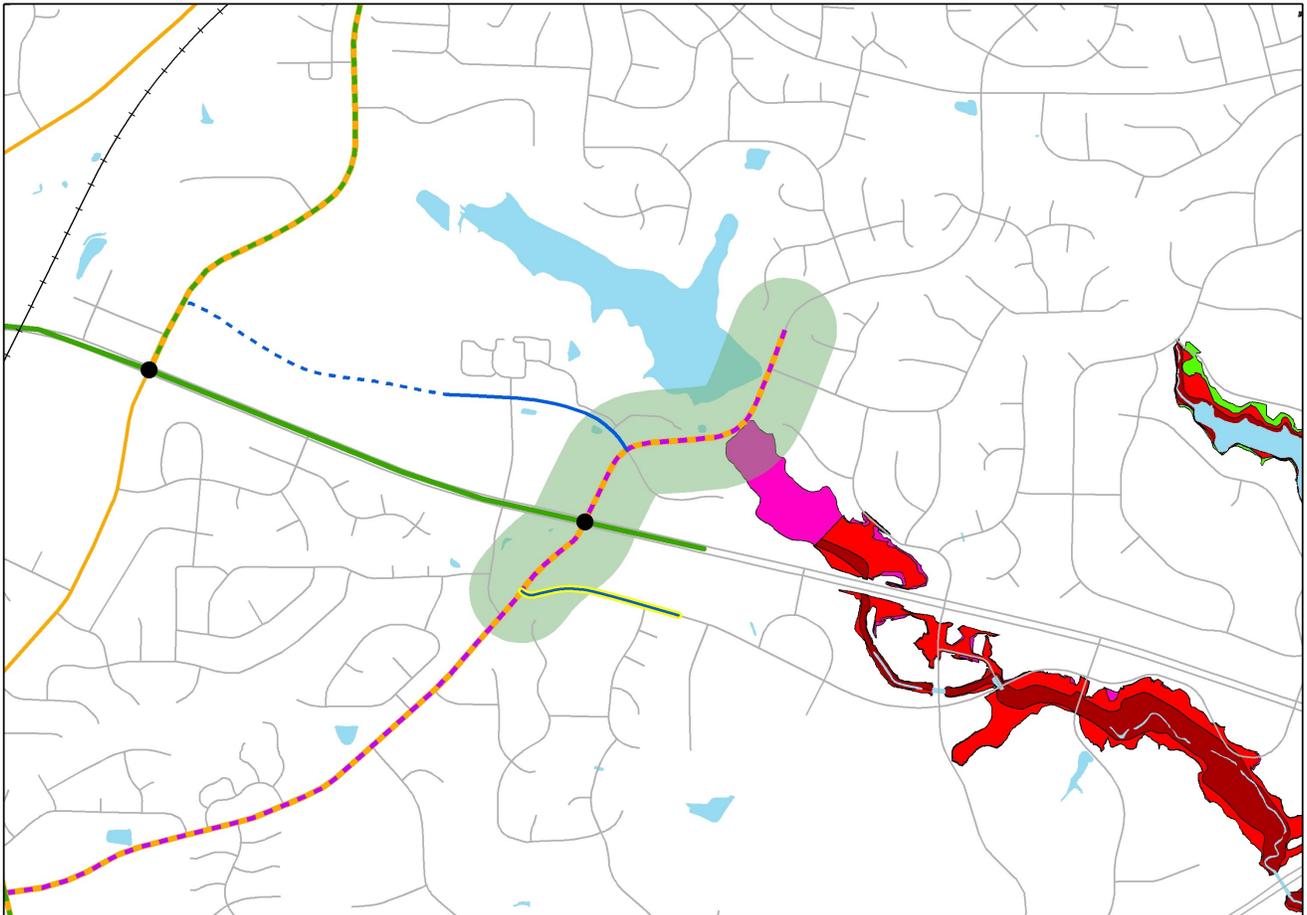
Kelly Road is a primary north-south thoroughfare serving the western portion of Apex. It is a parallel free alternative to the NC 540 toll facility and extends from Old US 1 to just north of US 64, with a crossing of Beaver Creek. Kelly Road continues into west Cary as Green Level Church Road. The current directional crossover at US 64 will be replaced with a grade-separated interchange as a part of the NC 540 project, increasing roadway capacity for both Kelly Road and US 64. Because of its proximity to several residential neighborhoods and the direct north-south connection it provides, Kelly Road will carry increasing levels of traffic. As a result, the road should be improved to accommodate 4 travel lanes with a median, sidewalks, and bicycle facilities.



## Lake Pine Drive

### **Vision and Purpose**

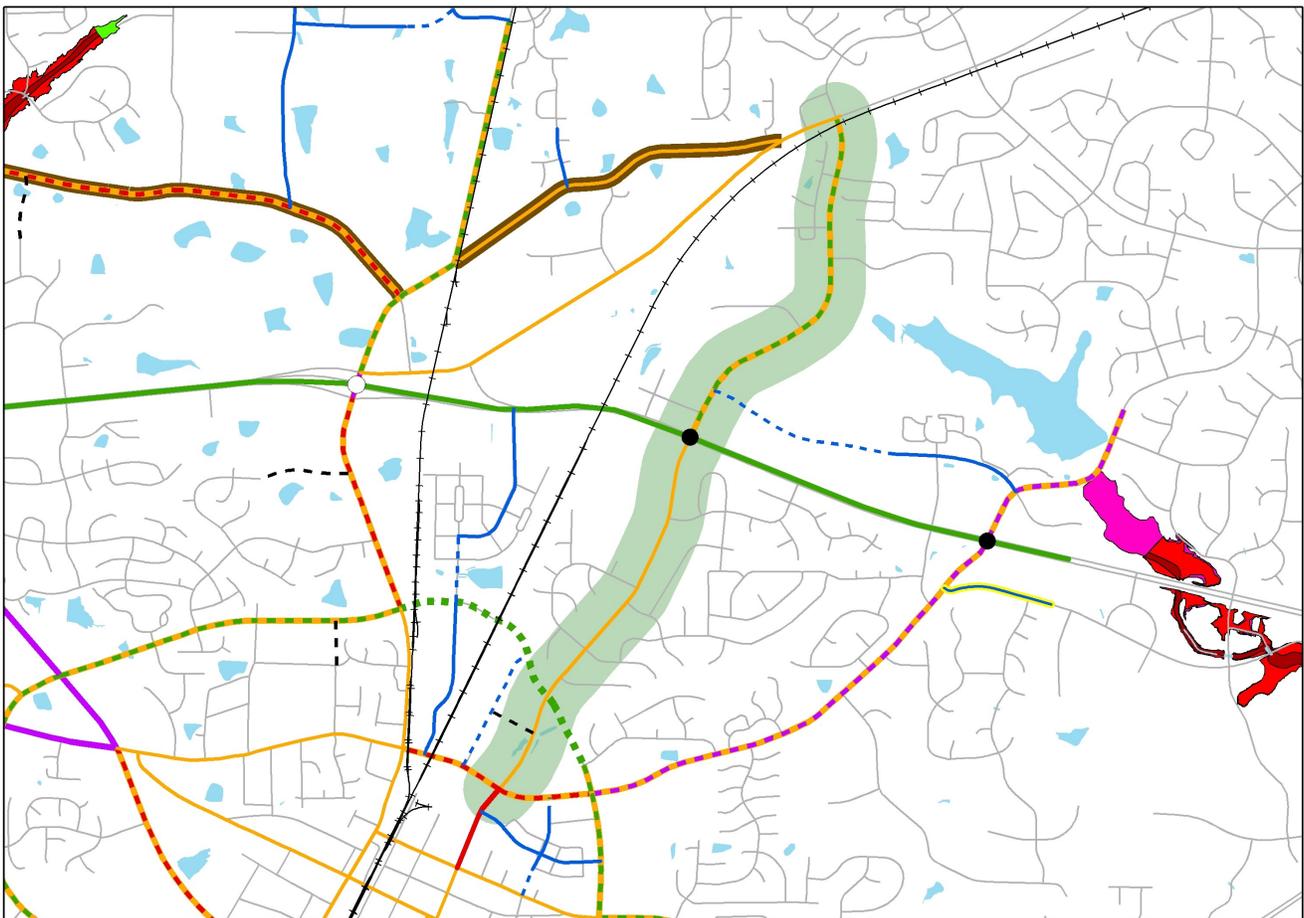
Lake Pine Drive is a continuation of Old Raleigh Road, and subsequently Hunter Street and Olive Chapel Road. It connects Downtown Apex and the Apex Parkway with US 64 and Cary. The intersection at US 64 is a major access point for both Apex and Cary onto the highway. The US 64 Corridor Study identified this intersection as a priority for installation of a grade-separated interchange. In addition to its regional context, Lake Pine Drive also serves local shopping areas, a county library, and the Apex Community Park. The future roadway should facilitate the movement of pedestrians, bicyclists, and motor vehicles, while acting as a welcoming entrance into Apex.



## Laura Duncan Road

### **Vision and Purpose**

Despite its connection to Apex High School and its intersections with the Apex Parkway and US 64, the road currently only carries a moderate level of traffic. Built as a 2-lane local street, Laura Duncan will not support widening for additional travel lanes south of US 64 without major impacts to adjacent residential properties. The section north of US 64 has room to construct additional travel lanes that would connect Apex with southwest Cary while providing access to the Apex Community Park. Laura Duncan Road also crosses the CSX railroad near the border with Cary.



## Mason Street

### **Vision and Purpose**

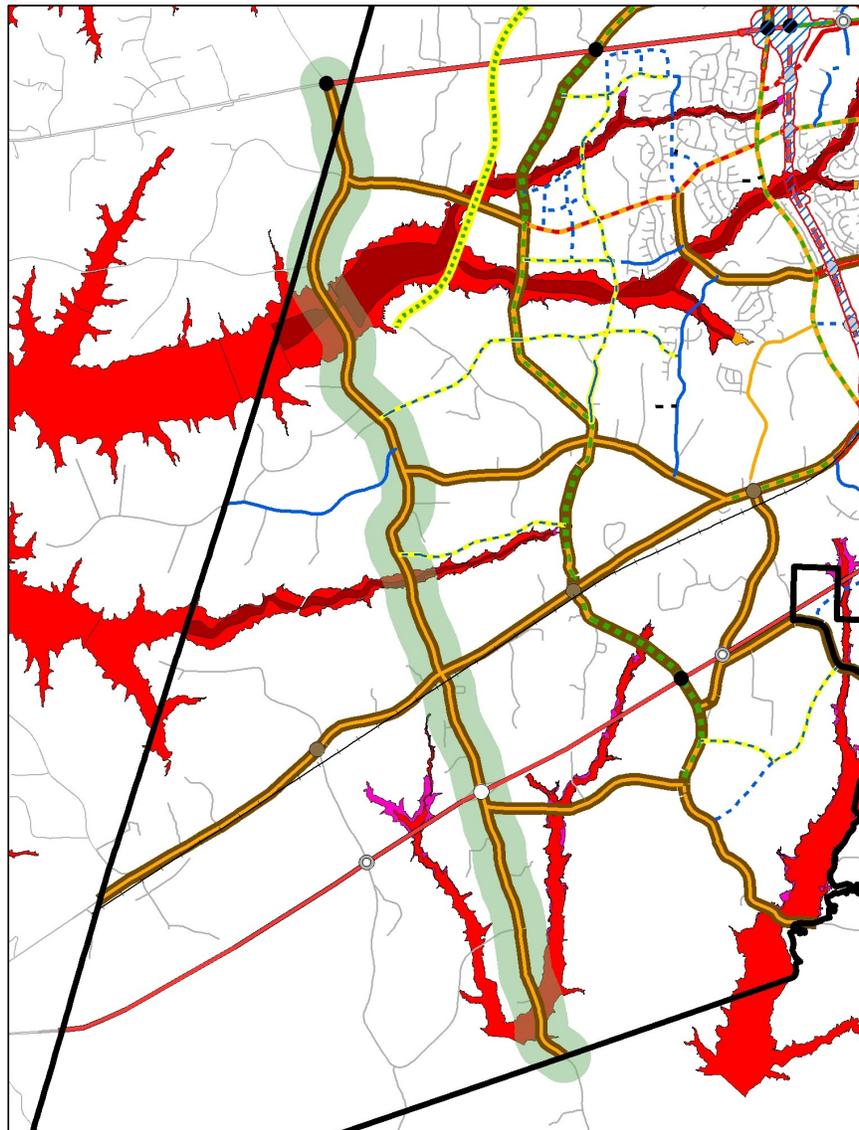
Mason Street is a short urban street in the old rectilinear grid of roads. It acts as a transition between Laura Duncan Road and the downtown grid network. Because of its proximity to the Apex Peakway and its connection with Center Street and Laura Duncan Road, Mason Street will carry slightly more traffic than nearby local streets. Mason Street will function in the future as an urban 3-lane thoroughfare that supports a moderate level of vehicles and pedestrians while maintaining access to adjacent properties.



## New Hill Olive Chapel Road/New Hill Holleman Road

### **Vision and Purpose**

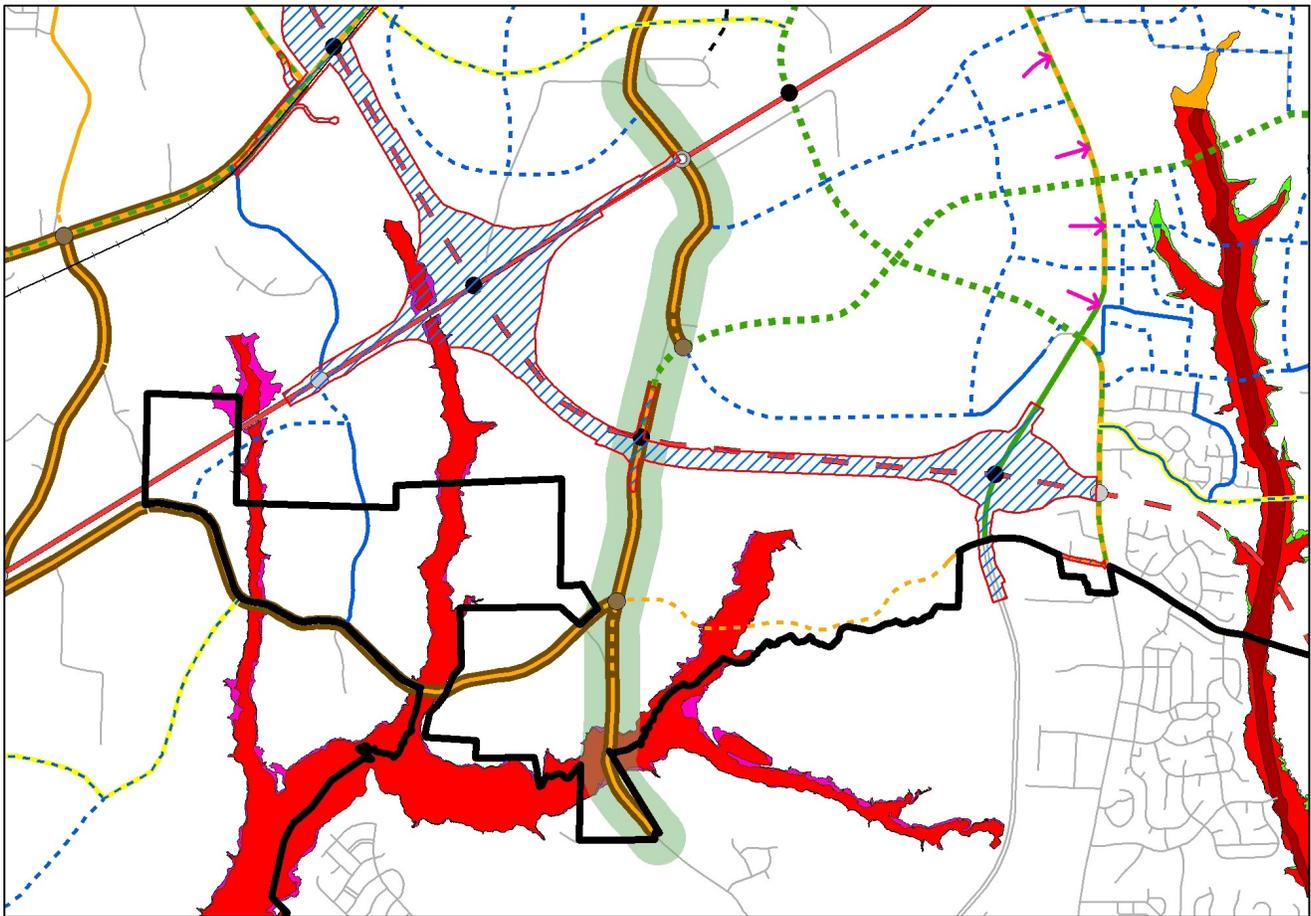
New Hill Olive Chapel Road (and New Hill Holleman Road) is a north-south rural road along the western edge of Wake County extending from Holly Springs to New Hill, providing access to US 64 and US 1 as well as a trailhead for the American Tobacco Trail. The road is essentially a southern extension of NC 751 which is a major route to Durham. The road also crosses Beaver Creek right before it enters Jordan Lake. From the Western Area Plan meetings it was determined that this road should maintain its rural feel with the major north-south mobility accommodated along Richardson Road. Despite the plan to maintain a rural cross-section, New Hill Olive Chapel Road should be located within a 100' right-of-way in order to provide additional space for future travel lanes or nonmotorized facilities should development patterns change west of Apex.



## Old Holly Springs Apex Road

### **Vision and Purpose**

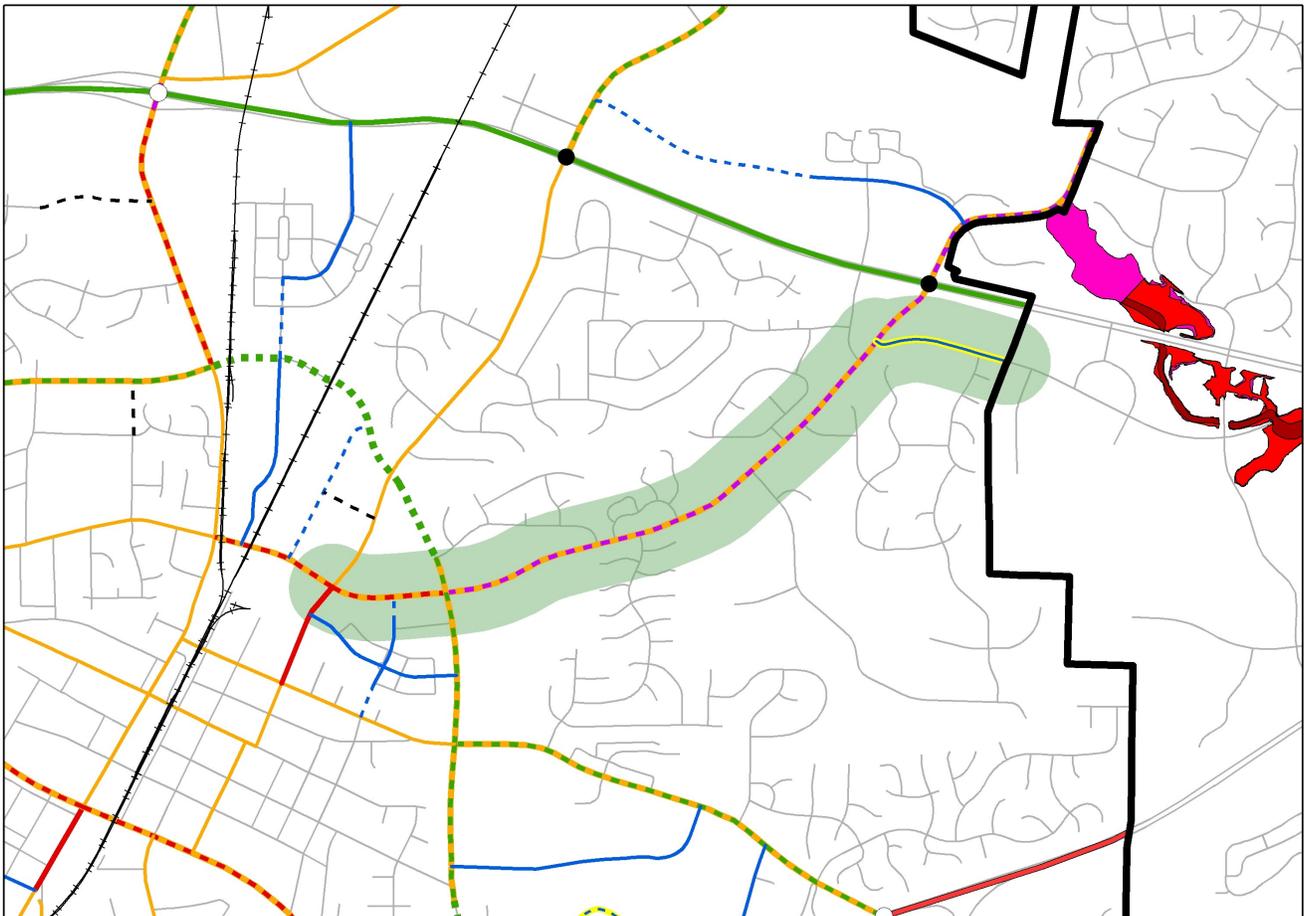
Old Holly Springs Apex Road is a rural connection between Holly Springs and the southern portion of Apex connecting with Tingen Road and South Salem Street. The road carries little traffic but provides an essential grade-separated crossing over US 1 and is planned to connect to NC 540 with an interchange. The road will be an integral part of the transportation network that accesses the Veridea mixed-use development. The road may be realigned at the intersection with Jessie Drive Extension as the area is developed.



## Old Raleigh Road

### Vision and Purpose

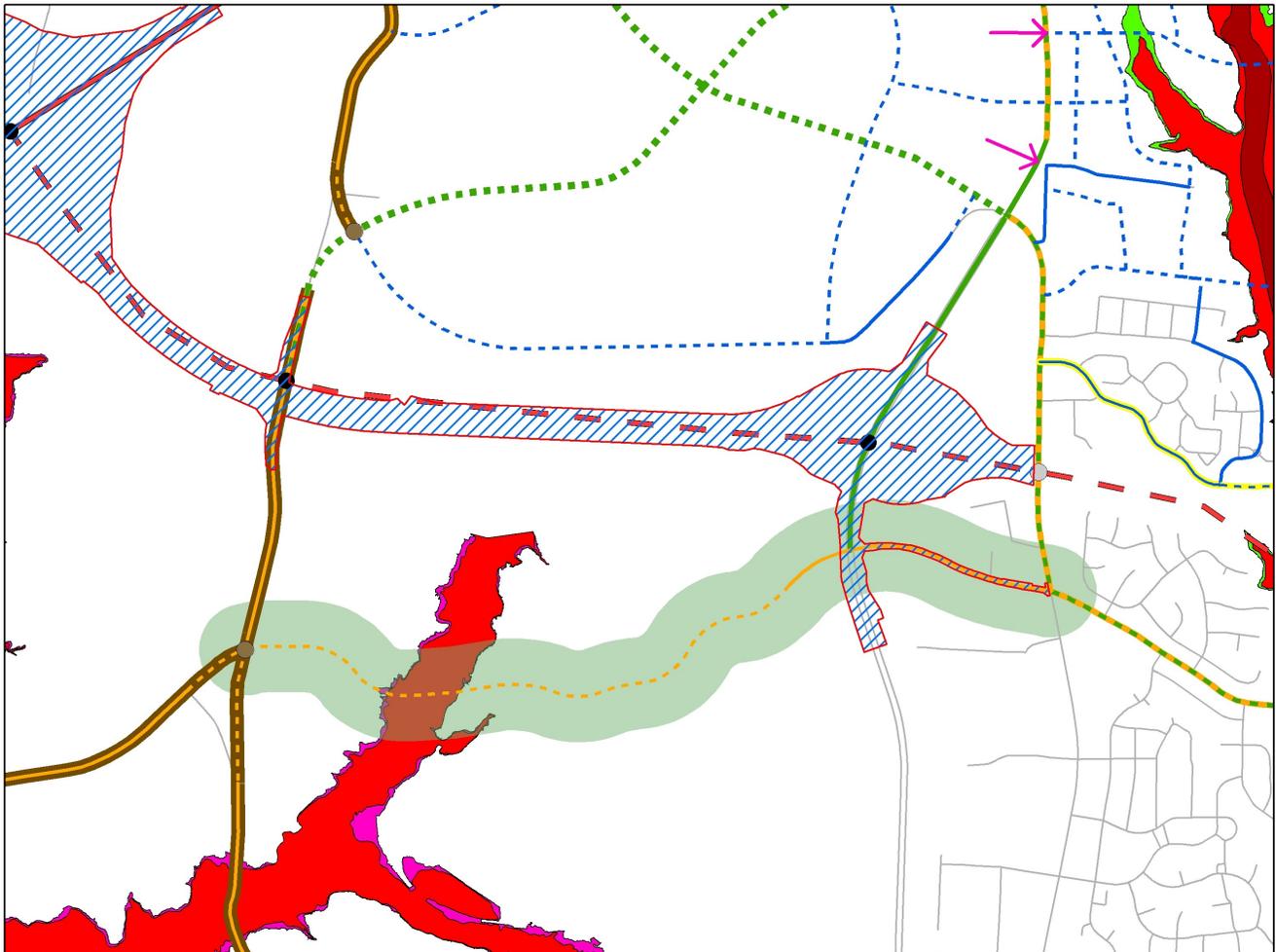
Old Raleigh Road is an eastern continuation of Olive Chapel Road and Hunter Street. Because it connects the Apex Peakway and US 64 (via Lake Pine Drive), Old Raleigh Road will carry a moderate amount of traffic. Where it turns to the east, Old Raleigh Road creates a local connection between Cary and Apex. Due to other alternate routes to US 64, Old Raleigh Road will likely not carry enough traffic to justify a 5-lane facility; however, because much of the road has already be set at that width, the remainder of the sections should match as development occurs. Old Raleigh Road also functions as important gateway into town.



## Old Smithfield Road

### **Vision and Purpose**

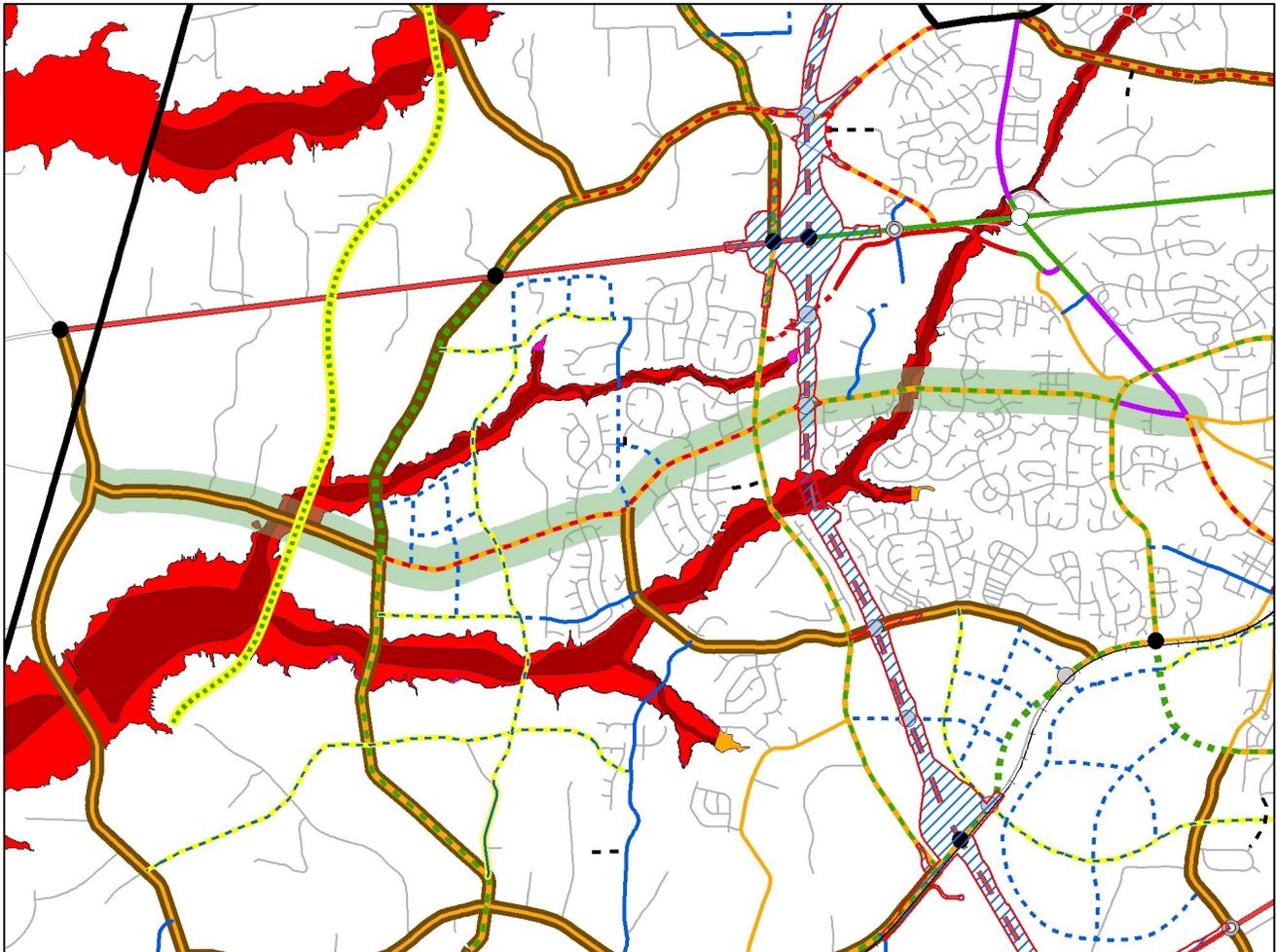
Old Smithfield Road is a future western extension of Sunset Lake Road. The road is planned to run through the Wake County Landfill property before connecting to Old Holly Springs Apex Road. The road will provide a local alternative to the southern portion of NC 540 with a stream crossing of Big Branch. As a local road, Old Smithfield Road will not carry much traffic but will provide moderate connectivity for southern Apex.



## Olive Chapel Road

### **Vision and Purpose**

Olive Chapel Road is a picturesque east-west thoroughfare paralleling US 64. Listed as one of the Steering Committee's favorite roads for its scenic qualities, Olive Chapel Road is perhaps the most iconic road in Apex. Olive Chapel Road connects urban Apex with the rural, undeveloped land to the west bordering Jordan Lake. The road connects NC 55, Apex Peakway, Kelly Road, Richardson Road, and New Hill Olive Chapel Road, while serving several residential neighborhoods and commercial developments. Olive Chapel Road acts as a local alternative to US 64 with a crossing of Beaver Creek and a bridge over NC 540. The road also provides access to the American Tobacco Trail. As it leaves the Apex corporate limits Olive Chapel Road should transition from a multi-lane facility to a 2-lane road and from urban curb-and-gutter to a rural shoulder section.



## Perry Road Extension

### **Vision and Purpose**

This road is a future extension of Perry Road to the south and across US 1. The road and its future interchange at US 1 will provide a major access point into the proposed Veridea development. To the south, Perry Road Extension will connect to NC 55 Business at the existing Technology Drive, which will be realigned. Because it will connect NC 55, Jessie Drive, US 1, and the Apex Peakway, the extension will be a multi-lane facility.

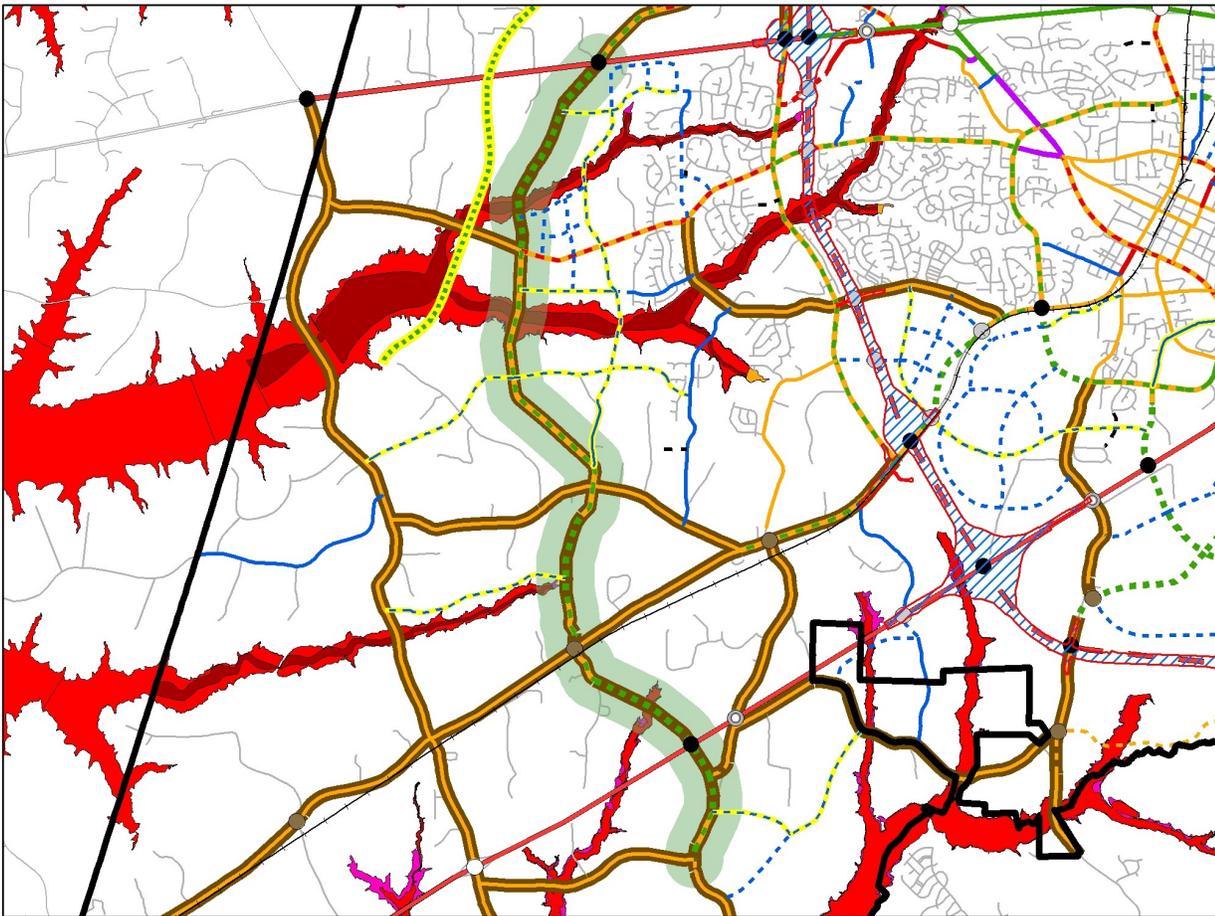


## Richardson Road

### Vision and Purpose

Currently existing as a minor rural connection between Humie Olive Road and Olive Chapel Road, Richardson Road will become a major connection between US 64, US 1, and southwest Apex. As determined by citizens in the Western Area Plan, Richardson Road will be the predominant north-south movement in the future in order to protect the rural nature of New Hill Olive Chapel Road. Richardson Road will extend to Jenks Road at US 64 via a grade-separated interchange and will connect Olive Chapel Road, Humie Olive Road, Old US 1, US 1, and Holly Springs New Hill Road. In addition to the planned interchange at US 64 there will be a grade-separated interchange at US 1 providing access to southwest Apex and Holly Springs as well as a crossing of the CSX railroad tracks.

Richardson Road should be built as a rural roadway to transition between urban and rural areas. New location sections of Richardson Road that do not initially warrant a multi-lane facility should be built as a 2-lane, median-divided road with a shoulder section to be expanded when necessary.



## Roberts Road

### **Vision and Purpose**

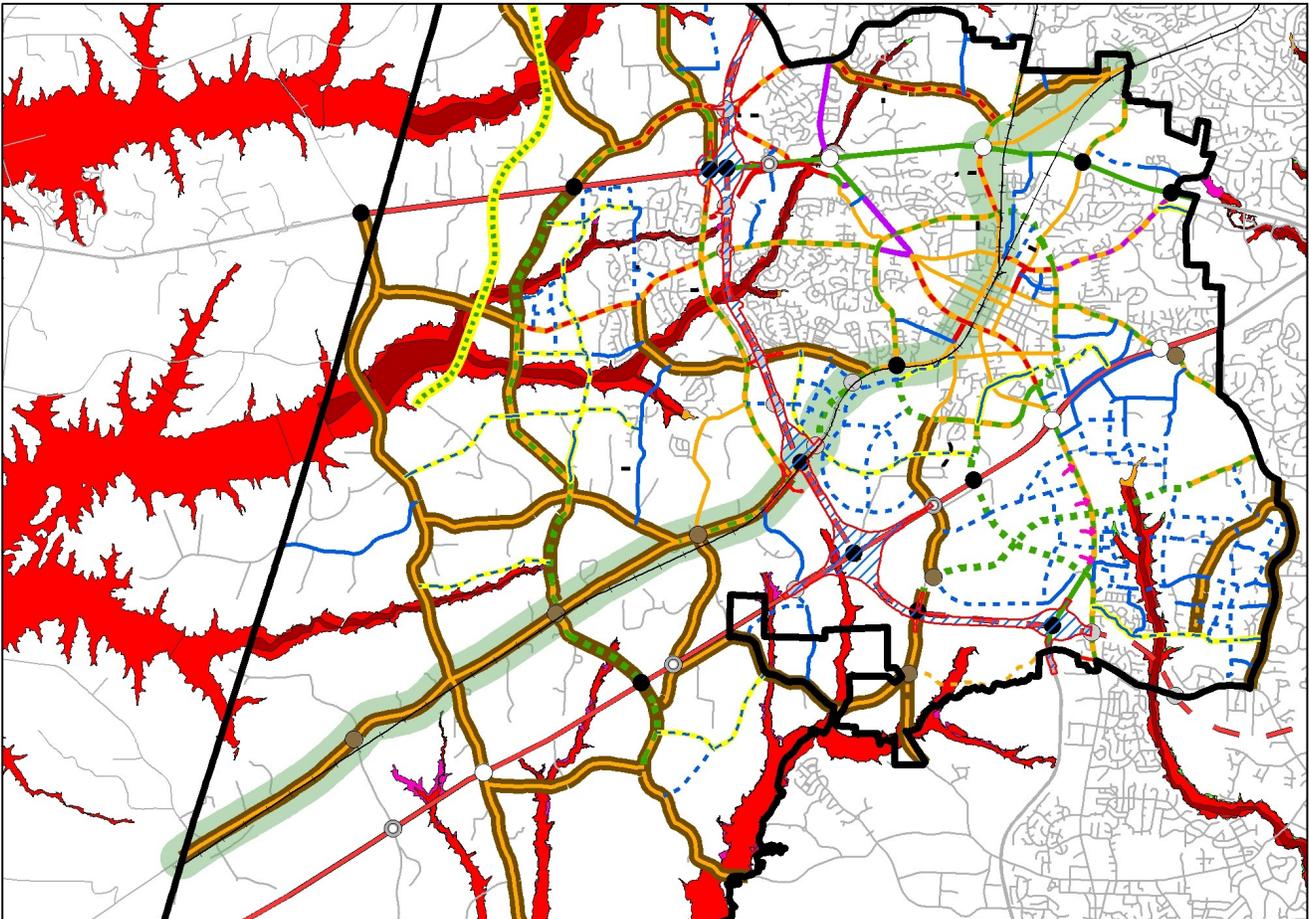
Roberts Road is a minor thoroughfare serving the northwest portion of Apex. It connects Jenks Road and Green Level Church Road. The road will provide a grade-separated crossing of NC 540 and will help serve the Green Level community as it develops. Because of the rural nature of the surrounding area, Roberts Road will stay as a 2-lane road except where turn lanes are needed.



## Salem Street/Old US 1

### Vision and Purpose

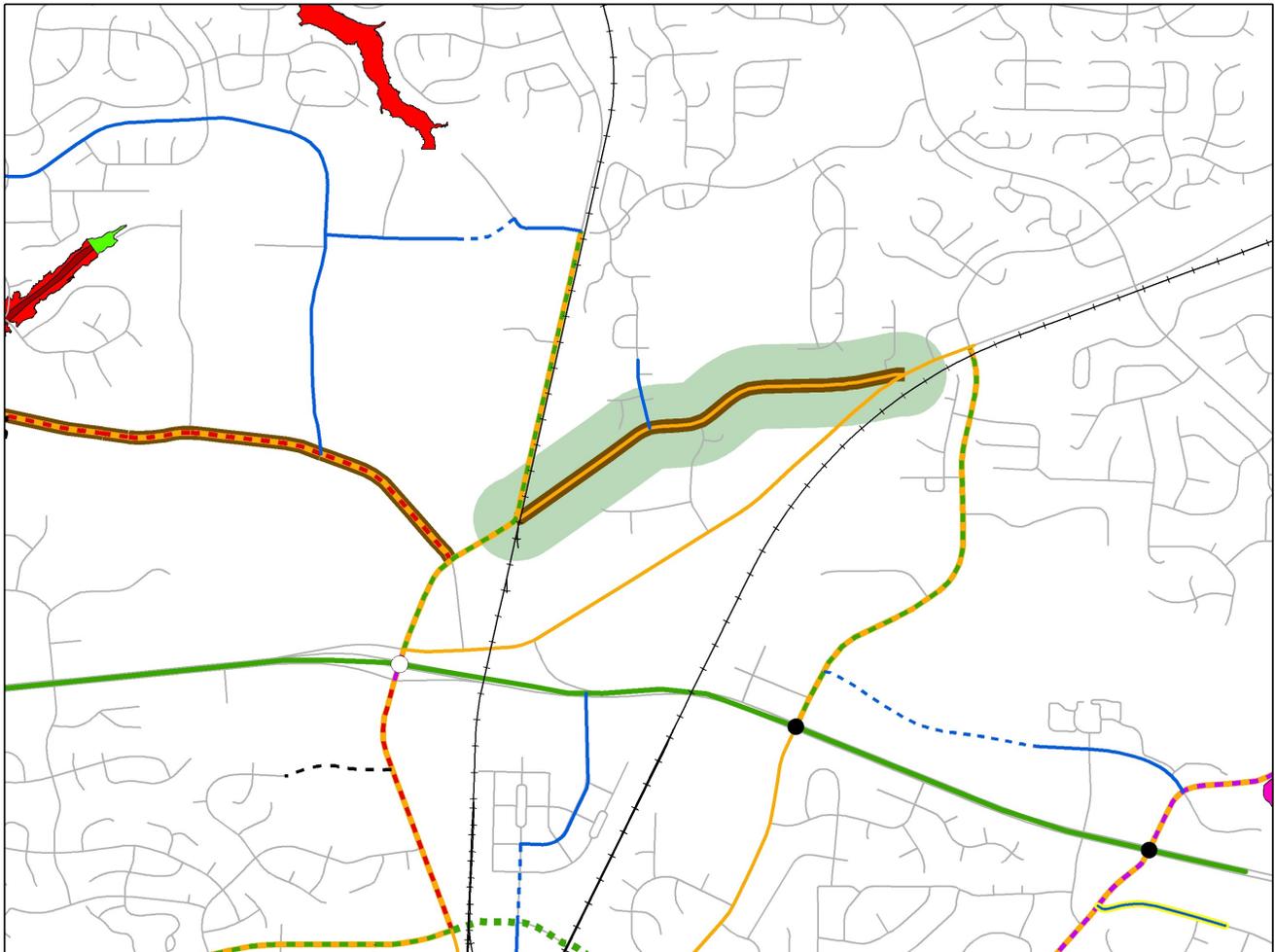
Part of the original US 1 Highway, Salem Street/Old US 1 represent an historical connection to the original highway system. The road showcases Apex over time as it passes through contemporary subdivisions, historic downtown, and horse farms, while paralleling the CSX railroad tracks. The road connects Davis Drive, US 64, Apex Parkway, Hunter Street, Chatham Street, NC 55, Tingen Road, Apex Barbecue Road, NC 540, Kelly Road, Holland Road, Humie Olive Road, and New Hill Olive Chapel Road. Salem Street also has grade-separated interchanges at US 64 and NC 540.



## Salem Church Road

### **Vision and Purpose**

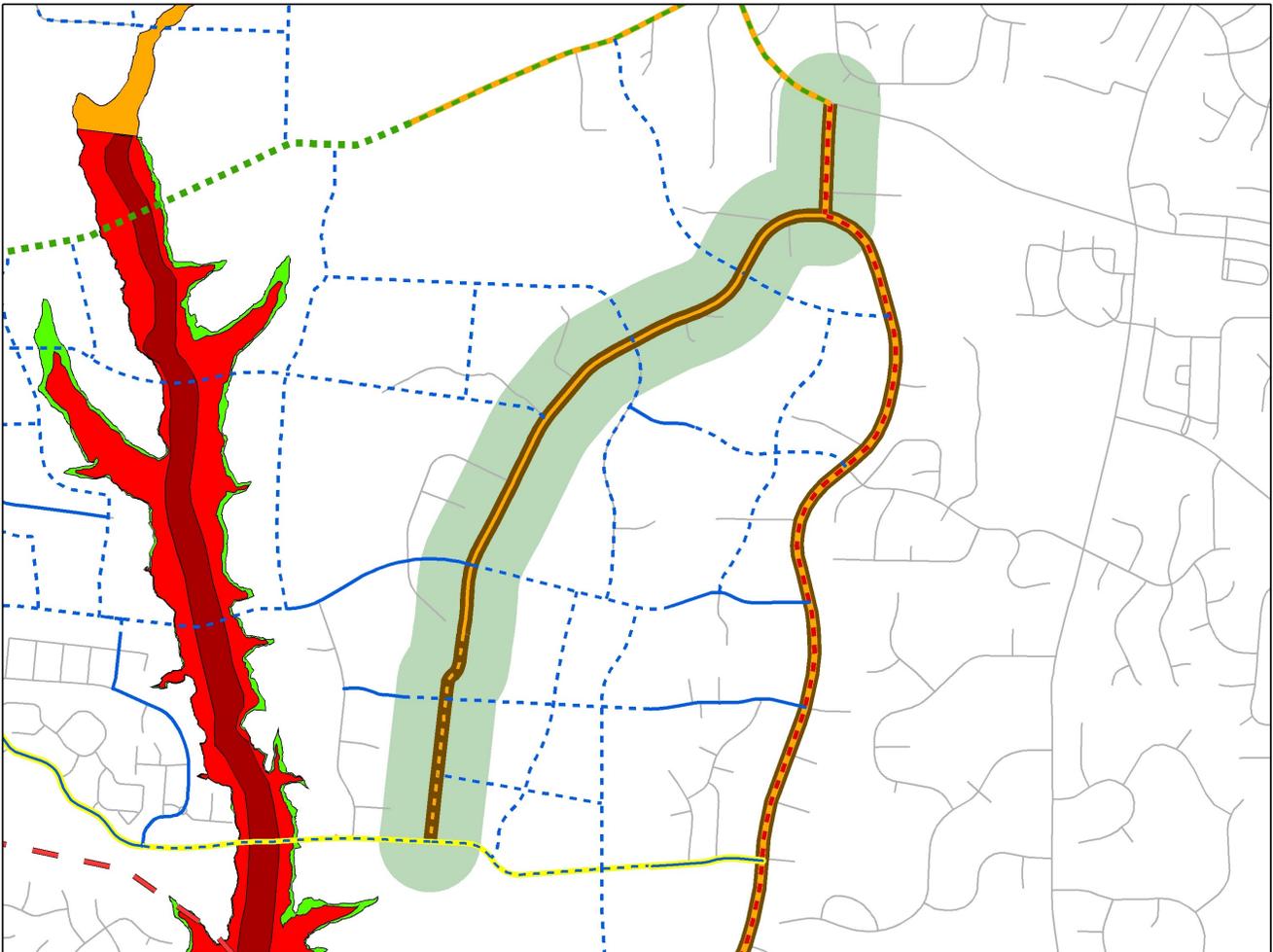
Salem Church Road is a short minor thoroughfare that has decreased in necessity with the increased use of Davis Drive and Old Apex Road in Cary. The road connects these two other thoroughfares and provides access to Salem Baptist Church and several neighborhoods. In addition, Salem Church Road has an existing crossing of the CSX tracks to Durham; however, due to the low traffic volumes at this intersection, the crossing may be considered for consolidation in the future.



## Smith Road

### **Vision and Purpose**

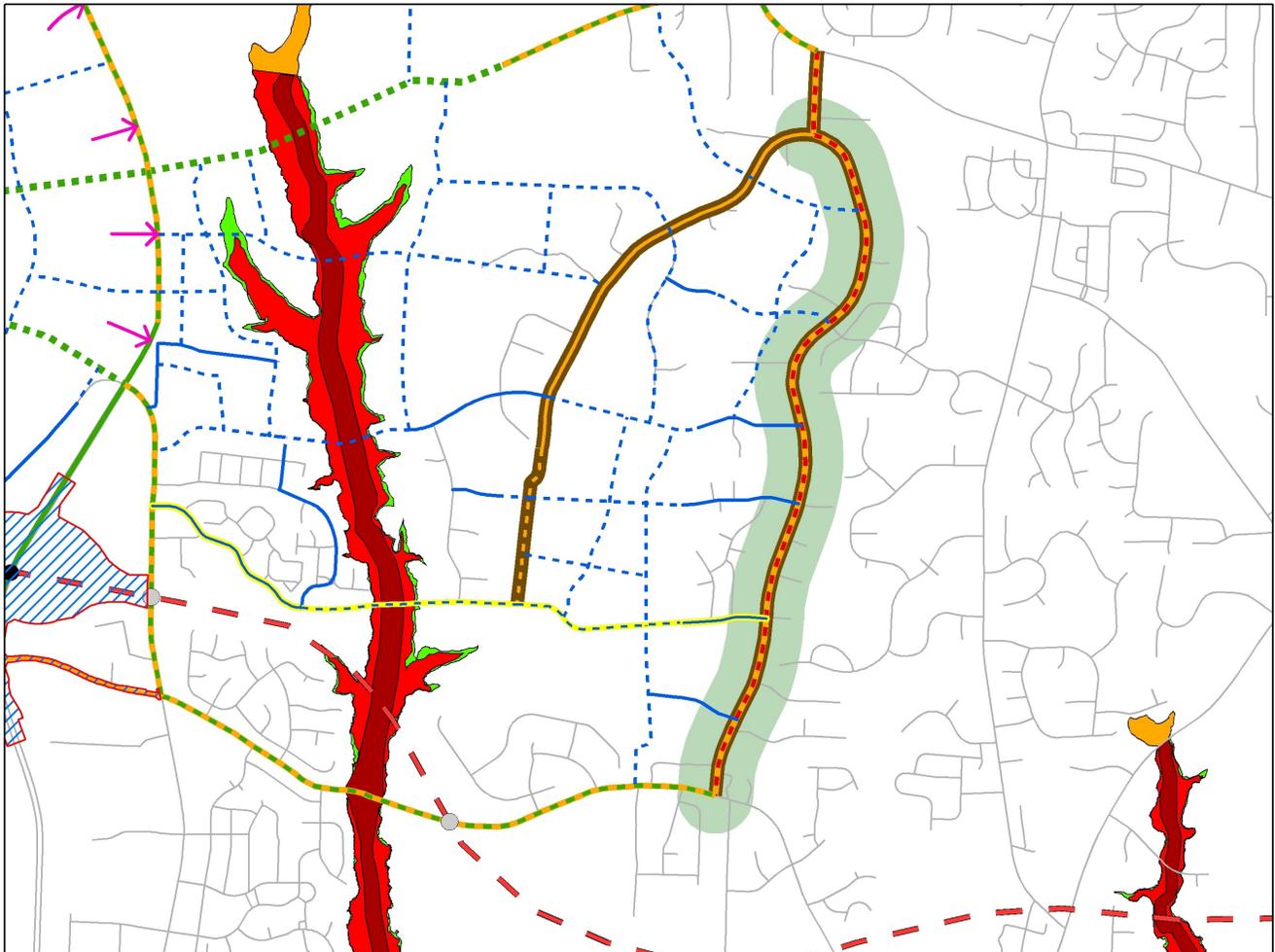
Smith Road and the surrounding area were added into the town's jurisdiction during the 2007 expansion of the ETJ. The existing dendritic street network in the area relies solely on Smith Road for its access to the rest of the region. Roughly 180 houses and 25,000 feet of roads are served by Smith Road alone prior to its connection with Stephenson Road. To better ensure future connectivity for emergency response, Smith Road should be integrated into the overall road network in Apex with, at minimum, a connection to NC 55, Stephenson Road, and Sunset Lake Road.



## Stephenson Road

### **Vision and Purpose**

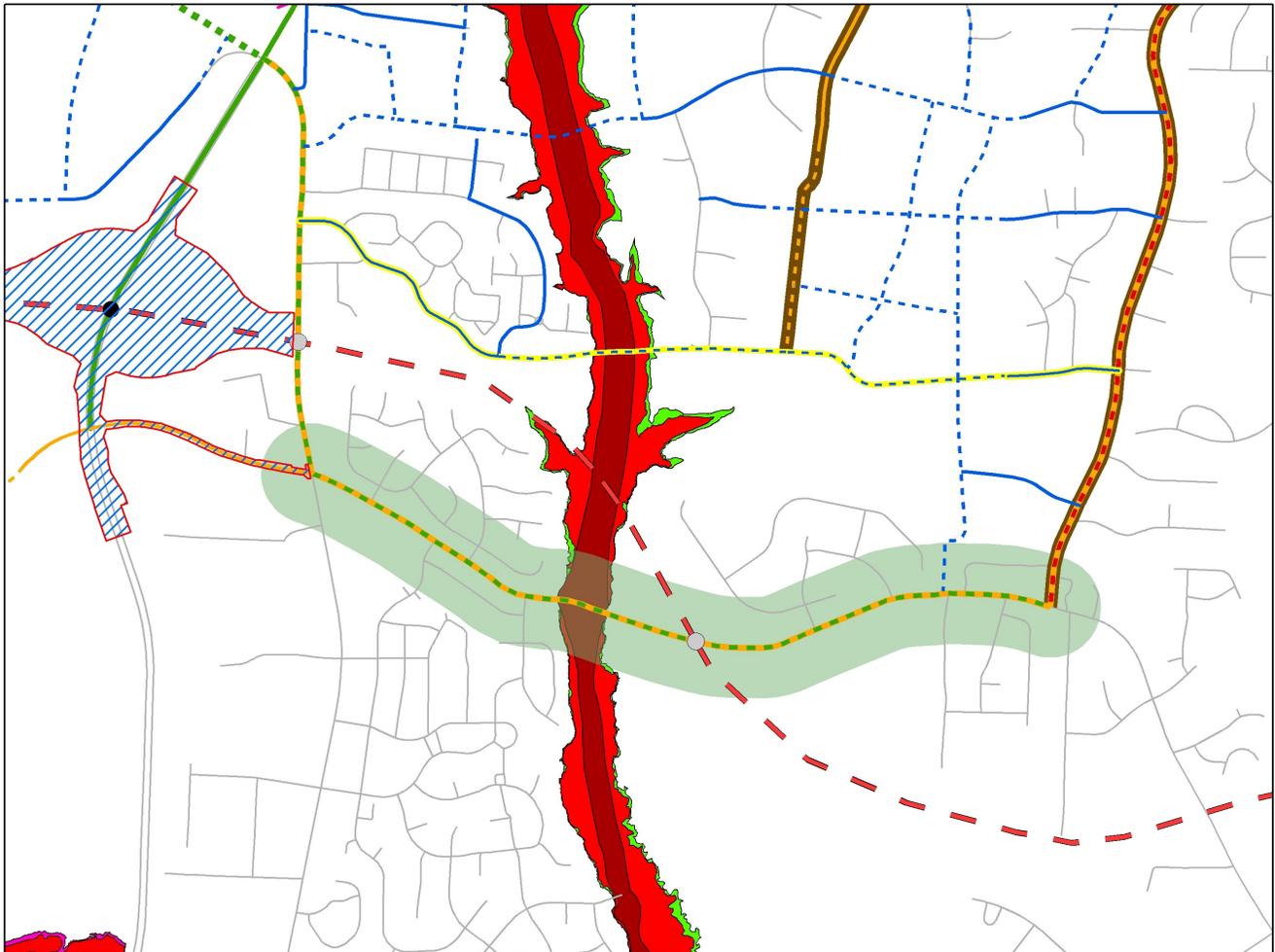
Stephenson Road is the easternmost thoroughfare in Apex. It provides a connection between Ten Ten Road and Sunset Lake Road. The road serves Apex as well as southeast Cary, northeast Holly Springs, and unincorporated Wake County. The road should reflect its rural nature while providing local land use access. Coordination between Apex, Cary, and Holly Springs will be essential to ensure a uniform roadway cross-section.



## Sunset Lake Road

### **Vision and Purpose**

Sunset Lake Road serves as the southern boundary between the jurisdictions of Apex and Holly Springs east of NC 55. The road currently crosses Middle Creek and in the future will have a grade-separated crossing of NC 540. Much of the traffic along this road originates in Holly Springs or unincorporated Wake County. With the opening of NC 540, Sunset Lake Road will continue to see an increase in vehicles between east Holly Springs and NC 55. Sunset Lake Road will likely require multiple travel lanes to accommodate the traffic.



## Tingen Road

### **Vision and Purpose**

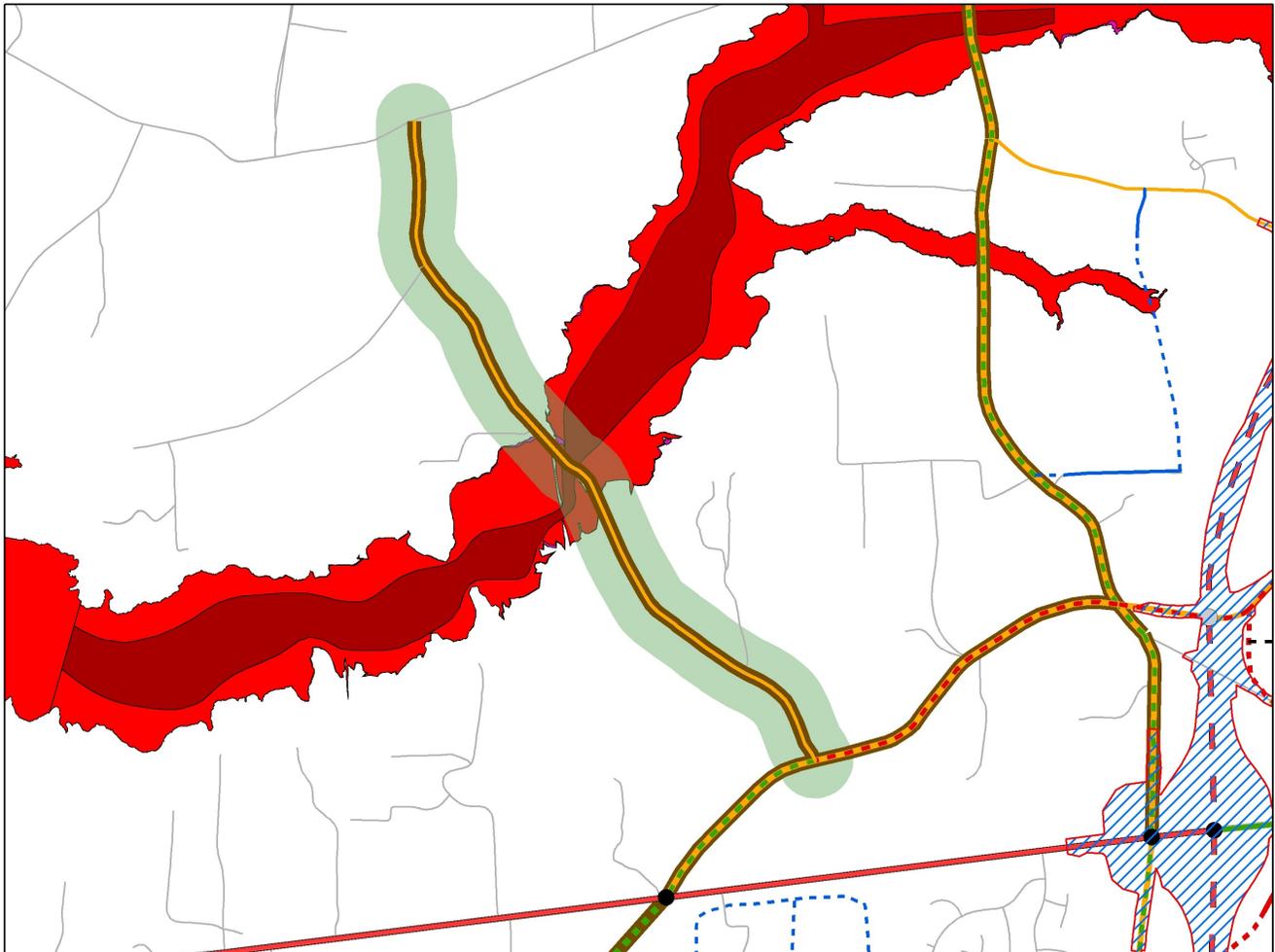
Tingen Road provides a direct connection between downtown Apex and southern Apex. Continuing as Old Holly Springs Apex Road, Tingen Road extends across US 1 into the Veridea property. It connects South Salem Street, James Street, and Apex Peakway, and bridges across US 1. South of the Apex Peakway, Tingen Road should maintain its rural nature.



## Wimberly Road

### **Vision and Purpose**

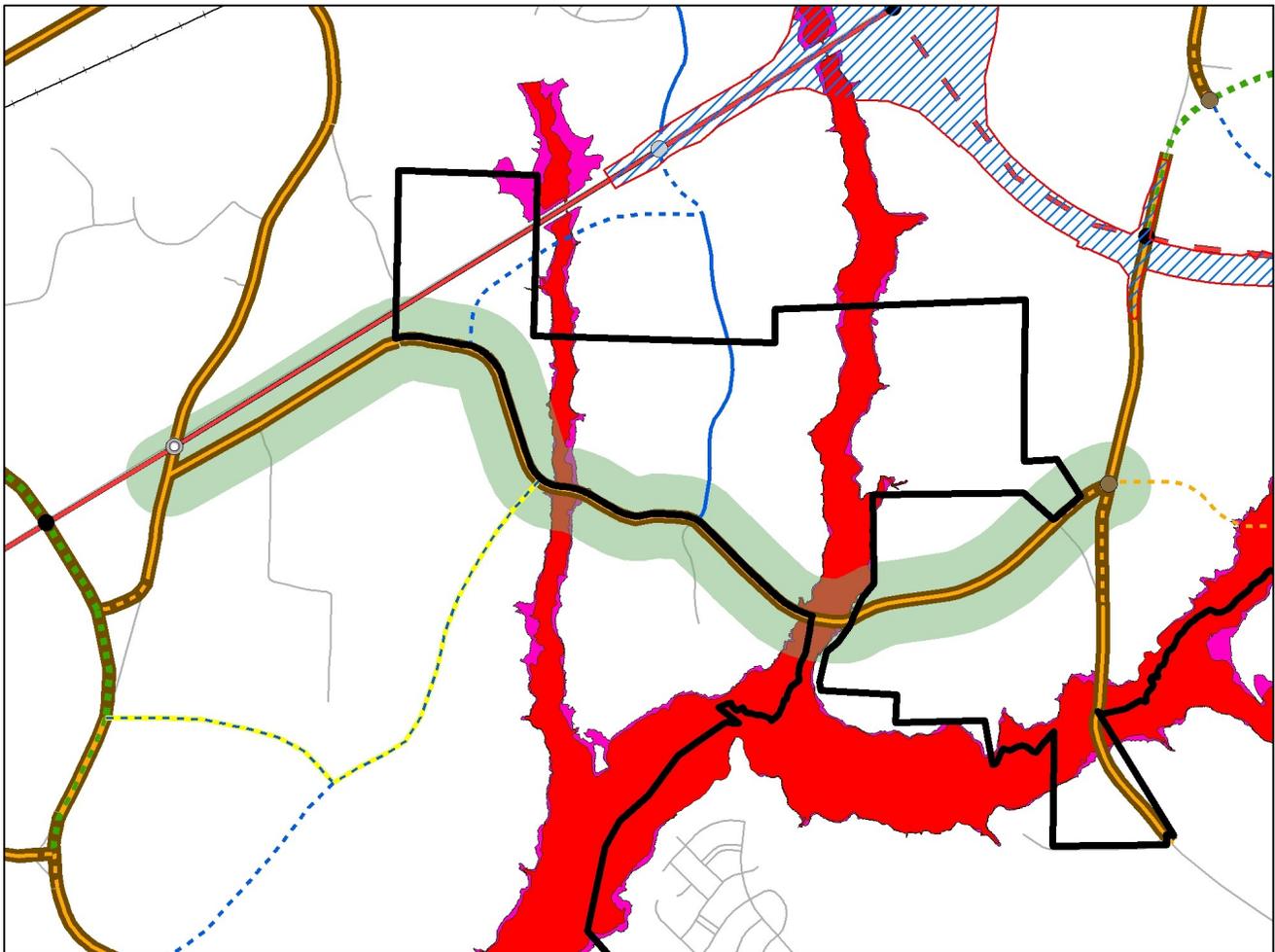
Wimberly Road is a minor rural thoroughfare between Jenks Road and Green Level West Road. When an interchange at Jenks Road and US 64 is constructed, Wimberly Road will likely experience an increase in motor vehicle traffic. Otherwise, the road will predominantly serve a rural area and provide access to the American Tobacco Trail. Wimberly Road also crosses White Oak Creek and will connect to a future greenway into Cary.



## Woods Creek Road

### **Vision and Purpose**

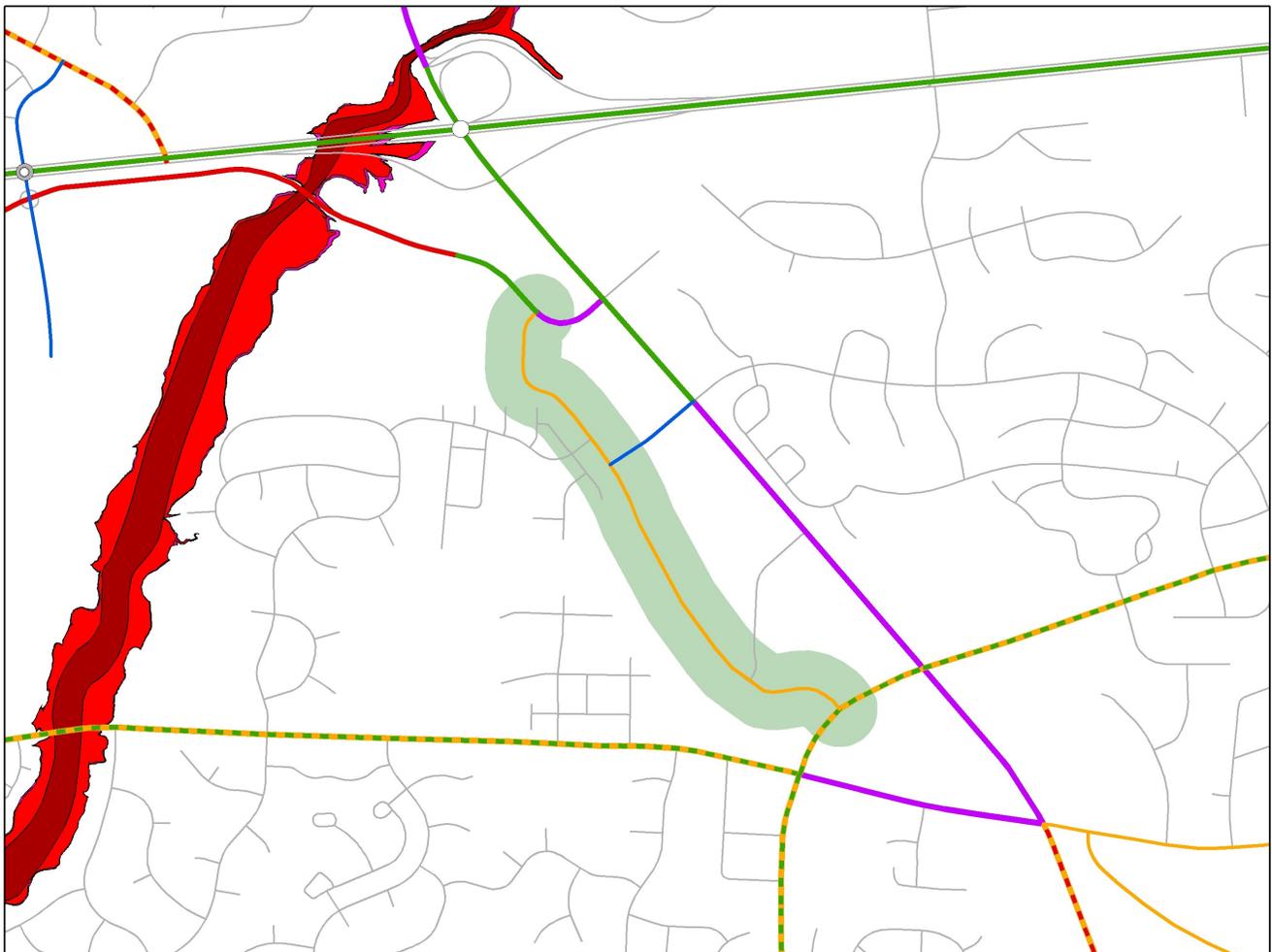
Woods Creek Road is a minor rural thoroughfare paralleling US 1. The road connects Friendship Road and Old Holly Springs Road, serving southwest Apex and northwest Holly Springs. The road should remain rural in order to reflect the limited development to take place in the area. Woods Creek Road also crosses two branches of White Oak Creek that feed Harris Lake.



## Zeno Road

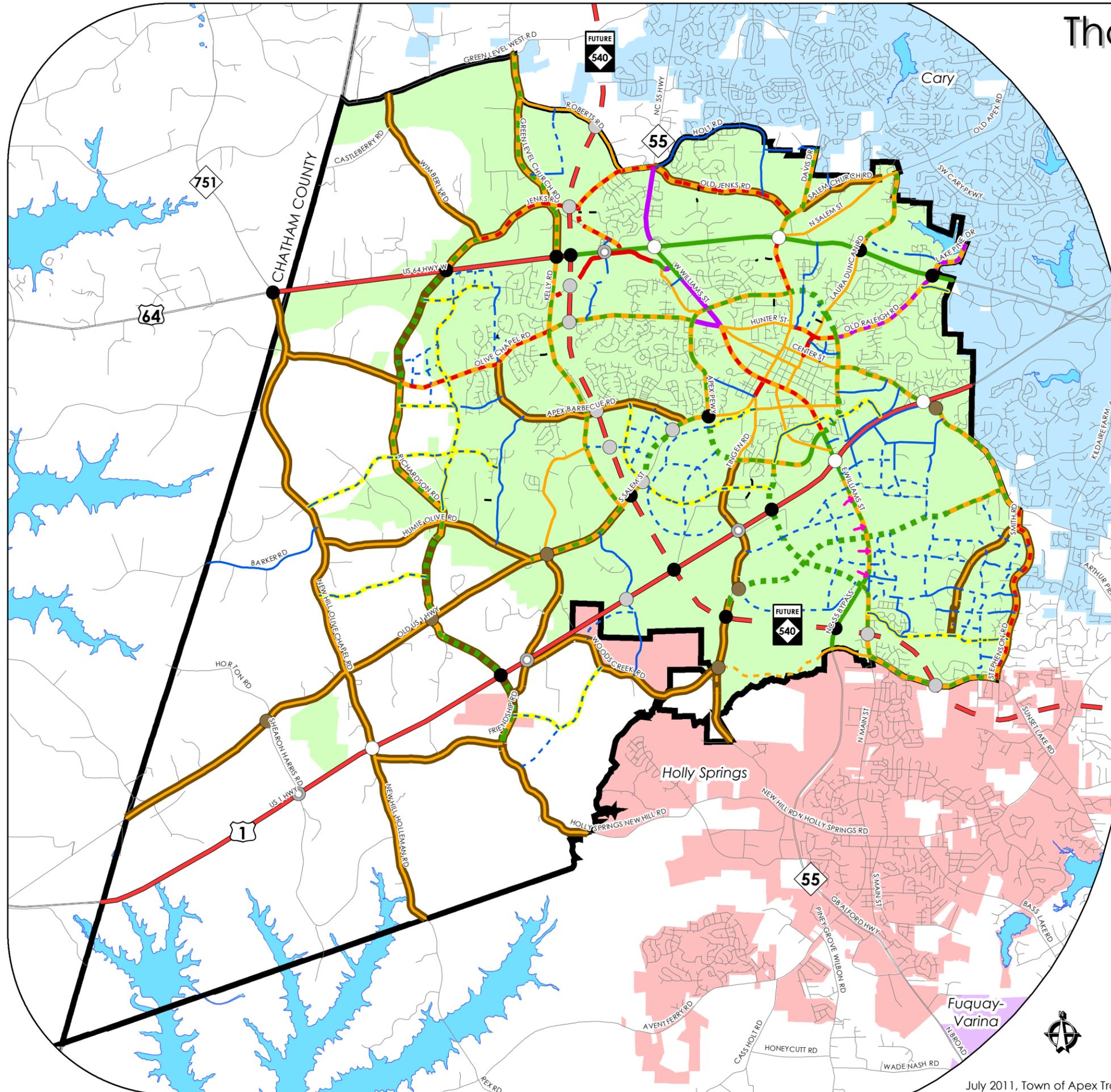
### **Vision and Purpose**

Zeno Road is a minor thoroughfare connecting Apex Peakway and Beaver Creek Commons Drive. It serves Olive Chapel Village, the WakeMed Apex Healthplex, and Beaver Creek Commons Drive, while providing a parallel route to NC 55. Zeno Road will remain minor even as it develops and should continue to provide access to local land uses.





# Thoroughfare and Collector Street Plan Appendix B



**Intersection Treatments:**

- Future Realignment
- Existing Grade Separation
- Future Grade Separation
- Existing Interchange
- Future Interchange
- ➔ Future Full-Movement Intersection

**Special Street Designations:**

- Rural
- - - Future Local Connector

**Collector Streets:**

**Minor Collector:**

- Existing
- - - New Location

**Major Collector:**

- Existing
- - - New Location

**Thoroughfares:**

**2 Lanes:**

- Existing
- - - New Location

**3 Lanes:**

- Existing
- - - New Location
- Widening

**4 Lanes with Median:**

- Existing
- - - New Location
- Widening

**5 Lanes:**

- Existing
- Widening

**Freeway:**

- Existing
- New Location

— Existing Streets    Water Body    Apex Jurisdiction    Study Area    Wake County Line

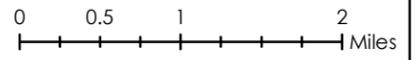
The Town of Apex Planning Department and Geographic Information Services (GIS) shall not be held liable for any errors concerning content or positional accuracy of this mapped information. "New Location" roadway alignments are not exact. Proposed locations for future roadways are chosen using the best data available at the time of approval. The user must consult the primary sources from which the Town of Apex Planning Department and GIS compiled this product.

Adopted by Town of Apex Board of Commissioners October 15, 2002

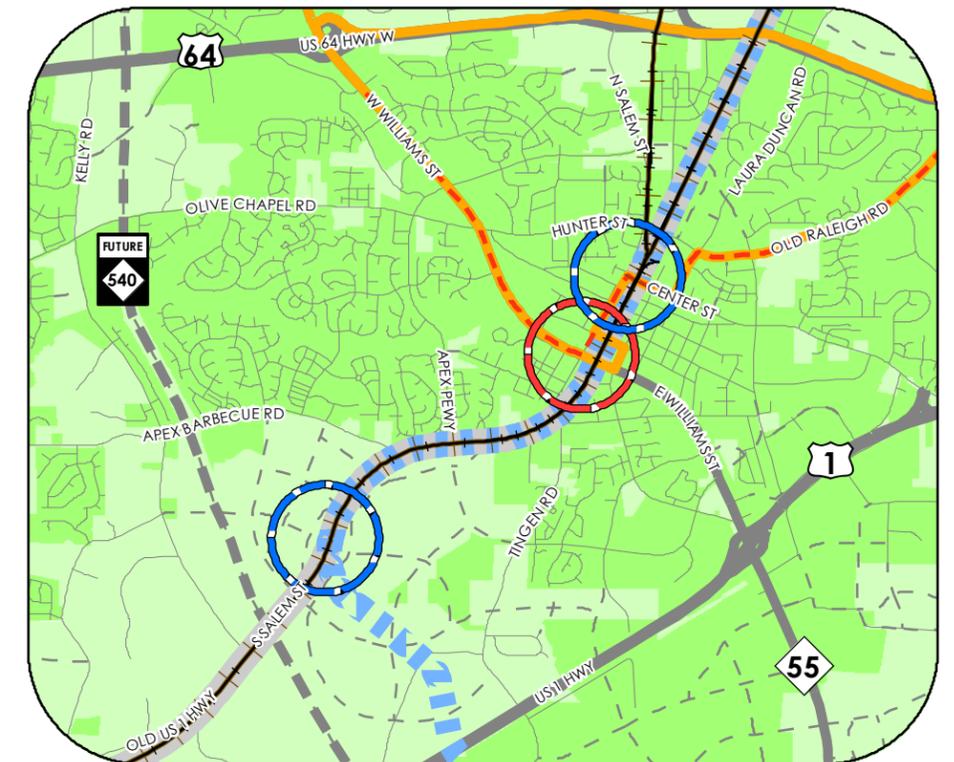
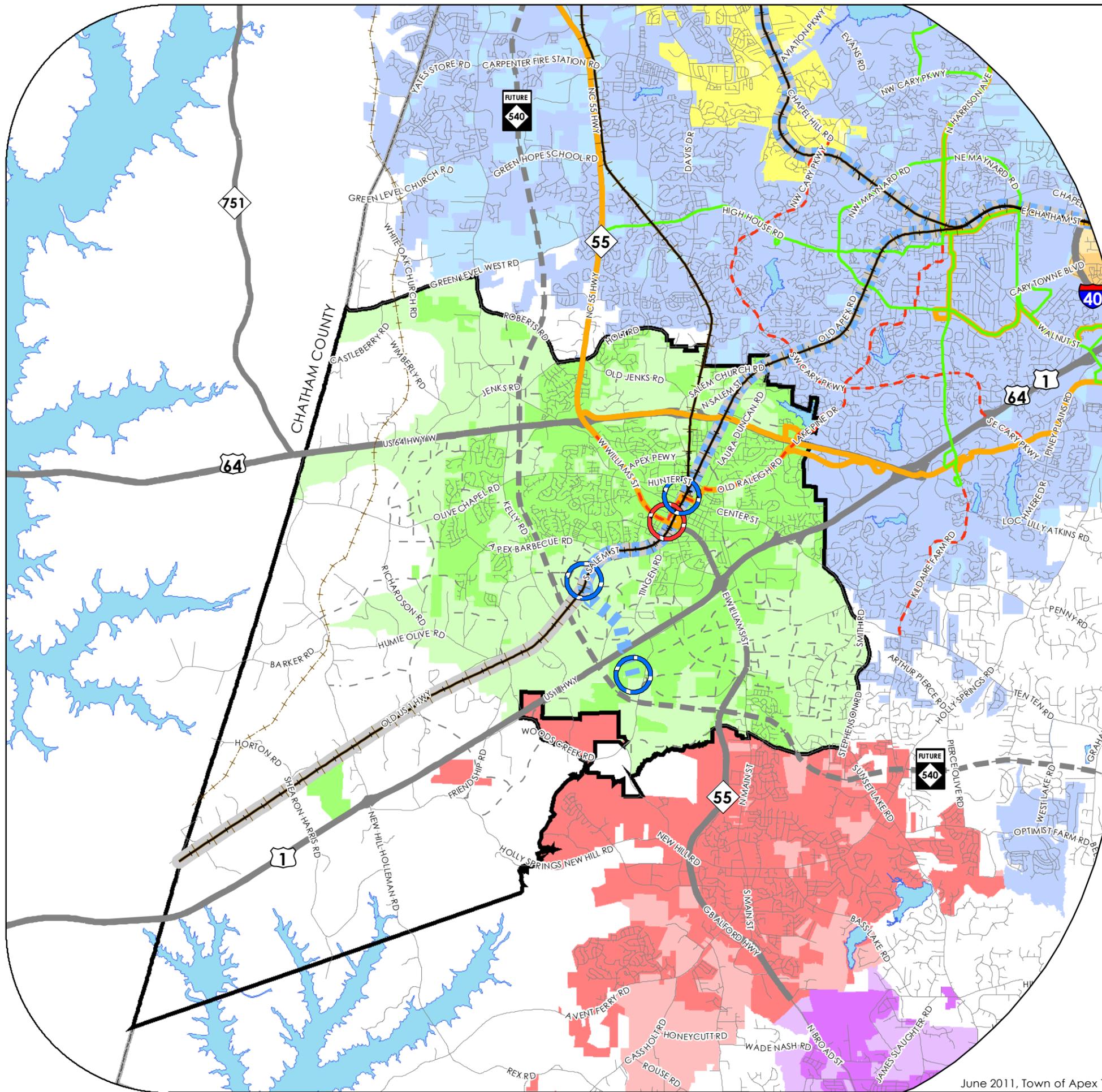
Amended:  
 March 16, 2004                      July 20, 2004                      March 15, 2005  
 May 18, 2004                         October 19, 2004                      May 17, 2005

Updated by the Town of Apex Town Council March 21, 2006

Amended:  
 February 20, 2007                      July 15, 2008                      October 19, 2010  
 August 21, 2007                         October 21, 2008  
 October 16, 2007                         December 15, 2009



# Transit Plan Appendix C

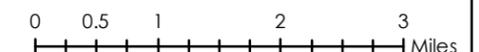


- |                                  |  |   |
|----------------------------------|--|---|
| <b>Potential Transit Center:</b> | Bus                                    | Study Area                                  |
|                                  | Rail and Bus                           | Wake County Line                            |
| <b>Transit Corridor:</b>         | Existing Cary Transit Bus Corridor     | Lake  |
|                                  | Existing Triangle Transit Bus Corridor | Apex Corporate Limits                       |
|                                  | Future Cary Transit Bus Corridor       | Apex Extraterritorial Jurisdiction          |
|                                  | Former Rail Corridor, Preserved        | Cary Corporate Limits                       |
|                                  | Existing Rail Corridor                 | Cary Extraterritorial Jurisdiction          |
|                                  | Existing Amtrak Corridor               | Fuquay-Varina Corporate Limits              |
|                                  | Possible Light Rail Corridor           | Fuquay-Varina Extraterritorial Jurisdiction |
|                                  | Existing Major Commuter Highway        | Holly Springs Corporate Limits              |
|                                  | Future Major Commuter Highway          | Holly Springs Extraterritorial Jurisdiction |
|                                  | Existing Street                        | Morrisville Corporate Limits                |
|                                  | Future Street                          | Morrisville Extraterritorial Jurisdiction   |
|                                  |  | Raleigh Corporate Limits                    |
|                                  |  | Raleigh Extraterritorial Jurisdiction       |

Adopted by Town of Apex Town Council October 15, 2002

Amended:  
March 15, 2005  
September 15, 2009

October 19, 2010



# Appendix D

Road Name		Street Type	Width (ft)		ROW (ft)		Lanes		Median/LT Treatment		Speed Limit (mph)		ADT		Capacity		ADT/Capacity		No Build ADT/Cap	FLOS	BLOS	BCI	
From	To		2010	2035	2010	2035	2010	2035	2010	2035	2010	2035	2010	2035	2010	2035	2010	2035					
Apex Barbecue Road	South Salem Street/Old US 1	Kelly Road	Minor T-fare	20	30	60	100	2	2	None	As Needed	45	45	4500	12000	12000	18000	0.375	0.666667	1	D	D	
	Kelly Road	Olive Chapel Road	Minor T-fare	21	30	60	100	2	2	None	As Needed	45	45	2100	23500	12000	18000	0.175	1.305556	1.958333333	D	D	
Apex Peakway	NC 55/West Williams Street	North Salem Street	Minor T-fare	28	71	100	100	2	4	None	Landscaped Median	35	35	NR	—	16500	36700	—	—	—			
	North Salem Street	Laura Duncan Road	Minor T-fare	n/a	71	n/a	100	n/a	4	Not Constructed	Landscaped Median	35	35	—	—	16500	36700	—	—	—			
	Laura Duncan Road	Old Raleigh Road	Minor T-fare	n/a	71	n/a	100	n/a	4	Not Constructed	Landscaped Median	35	35	—	—	16500	36700	—	—	—			
	Old Raleigh Road	Center Street	Minor T-fare	60	71	90	100	2	4	Landscaped Median	Landscaped Median	35	35	NR	—	16500	36700	—	—	—			
	Center Street	James Street	Minor T-fare	20	71	60	100	2	4	None	Landscaped Median	35	35	4000	—	16500	36700	0.242424	—	—	D	D	
	James Street	NC 55/East Williams Street	Minor T-fare	n/a	71	n/a	100	n/a	4	Not Constructed	Landscaped Median	35	35	—	—	16500	36700	—	—	—			
	NC 55/East Williams Street	Hughes Street	Minor T-fare	71	71	100	100	2	4	Landscaped Median	Landscaped Median	35	35	17500	—	36700	36700	0.476839	—	—	—		
	Hughes Street	Perry Road	Minor T-fare	Varies	71	100	100	2	4	Concrete Median	Landscaped Median	35	35	NR	—	16500	36700	—	—	—			
	Perry Road	Tingen Road	Minor T-fare	28	71	90	100	2	4	None	Landscaped Median	35	35	NR	—	16500	36700	—	—	—			
	Tingen Road	Old US 1	Minor T-fare	n/a	71	n/a	100	n/a	4	Not Constructed	Landscaped Median	35	35	—	—	16500	36700	—	—	—			
Center Street	Old US 1	Olive Chapel Road	Minor T-fare	28	71	90	100	2	4	None	Landscaped Median	35	35	NR	—	16500	36700	—	—	—			
	Olive Chapel Road	NC 55/West Williams Street	Minor T-fare	Varies	71	90	100	3	5	TW/LTL	TW/LTL	35	35	NR	—	16500	36700	—	—	—			
	North Salem Street	North Mason Street	Major T-fare	36	36	50	50	2	2	As Needed	As Needed	25	25	7900	7000	18000	18000	0.438889	0.388889	0.388888889	C	C	
West Chatham Street	North Mason Street	Schieffelin Rd/Apex Peakway	Major T-fare	20	20	50	50	2	2	As Needed	As Needed	35	35	12300	6000	18000	18000	0.683333	0.333333	0.333333333	D	E	
	Schieffelin Rd/Apex Peakway	Lufkin Road	Major T-fare	22	75	60	100	2	4	None	Landscaped Median	45	45	19500	32000	12000	38000	1.625	0.842105	2.666666667	E	F	
East Chatham Street	Hunter Street	Jones Street	Minor T-fare	25	35	50	60	2	2	None	As Needed	25	25	2100	n/a	12000	18000	0.175	n/a	—	C	C	
	Jones Street	Salem Street	Minor T-fare	32	35	50	60	2	2	None	As Needed	25	25	2100	n/a	12000	18000	0.175	n/a	—	C	C	
Davis Drive	Salem Street	Elm Street	Minor T-fare	32	32	50	50	2	2	None	None	25	25	2900	n/a	12000	12000	0.241667	n/a	—	C	C	
	Elm Street	Mason Street	Minor T-fare	21	21	40	50	2	2	None	None	25	25	2900	n/a	12000	12000	0.241667	n/a	—	C	C	
Friendship Road	Farmpond Road	Salem Church Road	Major T-fare	24	75	30	100	2	4	None	Landscaped Median	45	45	14500	23000	12000	38000	n/a	0.605263	1.916666667	D	E	
	Salem Church Road	Old Jenks Road	Major T-fare	24	75	60	100	2	4	None	Landscaped Median	45	45	14500	22000	12000	38000	1.208333	0.578947	1.833333333	D	E	
	Old Jenks Road	North Salem Street	Major T-fare	32	75	60	100	2	4	As Needed	Landscaped Median	45	45	14500	18000	18000	38000	n/a	0.473684	1	D	D	
Green Level Church Road	New Hill Holleman Road	Holly Springs New Hill Road	Major T-fare	20	30	60	65	2	2	None	As Needed	55	45	NR	8000	12000	18000	n/a	0.444444	0.666666667	-	-	
	Holly Springs New Hill Road	Old US 1	Major T-fare	20	30	60	65	2	2	None	As Needed	45	45	NR	5000	12000	18000	n/a	0.277778	0.416666667	-	-	
NC 55 Bypass	Green Level West Road	Jenks Road	Major T-fare	18	75	60	100	2	4	None	Landscaped Median	45	45	5900	16500	12000	38000	0.491667	0.434211	1.375	D	D	
	Jenks Road	US 64	Major T-fare	18	43	60	70	2	2	None	TW/LTL	45	45	8300	11000	12000	20000	0.691667	0.55	0.916666667	D	E	
Holly Springs New Hill Road	East Williams Street	Old Smithfield Road	Major T-fare	75	75	100	100	4	4	Not Constructed	Landscaped Median	55	55	2600	37500	38000	38000	0.684211	0.986842	0.986842105	D	E	
	Friendship Road	Holly Springs Town Limit	Minor T-fare	21	30	60	65	2	2	None	As Needed	55	45	7000	15000	12000	18000	0.058333	0.833333	1.25	C	D	
Humie Olive Road	NC 55/East Williams Street	Perry Road	Minor T-fare	20	35	60	60	2	2	None	None	35	35	2900	n/a	12000	12000	0.241667	n/a	—	D	D	
	Perry Road	NC 55/East Williams Street	Minor T-fare	20	35	60	60	2	2	None	None	25	25	1900	n/a	12000	12000	0.158333	n/a	—	C	C	
Hunter Street	New Hill Olive Chapel Road	Richardson Road	Minor T-fare	19	30	60	65	2	2	None	As Needed	45	45	NR	2500	12000	18000	n/a	0.138889	0.208333333	-	-	
	Richardson Road	Old US 1	Minor T-fare	19	30	60	65	2	2	None	As Needed	45	45	1500	6000	12000	18000	0.125	0.333333	0.5	D	D	
James Street	NC 55/West Williams Street	North Salem Street	Minor T-fare	35	35	60	60	2	2	None	As Needed	35	35	10300	6000	12000	18000	0.858333	0.333333	0.5	D	D	
	North Salem Street	Laura Duncan Road/North Mason Street	Minor T-fare	27	43	80	80	2	2	None	TW/LTL	35	35	11000	4500	12000	20000	0.916667	0.225	0.375	D	D	
Jenks Road	Tingen Road	South Hughes Street	Minor T-fare	18	35	60	60	2	2	None	As Needed	25	25	2700	n/a	12000	18000	0.225	n/a	—	C	C	
	South Hughes Street	NC 55/East Williams Street	Minor T-fare	20	35	50	60	2	2	None	As Needed	25	25	NR	n/a	12000	18000	n/a	n/a	—	D	C	
	NC 55/East Williams Street	Schieffelin Rd/Apex Peakway	Minor T-fare	20	35	60	60	2	2	None	As Needed	25	25	3500	n/a	12000	18000	0.291667	n/a	—	D	C	
Old Jenks Road	US 64	Green Level Church Road	Minor T-fare	19	43	60	70	2	2	None	TW/LTL	45	45	2400	15500	12000	20000	0.2	0.775	1.291666667	D	D	
	Green Level Church Road	Colony Woods Drive	Minor T-fare	19	43	60	70	2	2	None	TW/LTL	45	45	2700	7000	12000	20000	0.225	0.35	0.583333333	D	D	
	Colony Woods Drive	NC 55/West Williams Street	Minor T-fare	29	43	60	70	2	2	TW/LTL	TW/LTL	45	45	3900	17500	20000	20000	0.195	0.875	0.875	C	D	
Jessie Drive	NC 55/West Williams Street	Davis Drive	Minor T-fare	22	38	60	75	2	2	None	TW/LTL	45	45	3600	10000	12000	20000	0.3	0.5	0.833333333	D	D	
	E. Williams Street	Old Holly Springs Apex Road	Minor T-fare	n/a	n/a	n/a	n/a	4	4	Not Constructed	Landscaped Median	n/a	45	n/a	9000	n/a	38000	n/a	n/a	0.328947	-	-	
Kelly Road	Ten Ten Road	East Williams Street	n/a	n/a	75	n/a	100	n/a	4	Not Constructed	Landscaped Median	n/a	45	n/a	12500	n/a	38000	n/a	n/a	0.328947	-	-	
	Green Level Church Road	US 64	Major T-fare	27	75	60	100	2	4	None	Landscaped Median	45	45	700	19000	12000	38000	0.058333	0.5	1.583333333	C	C	
	US 64	Olive Chapel Road	Major T-fare	21	75	60	100	2	4	As Needed	Landscaped Median	45	45	9000	23000	18000	38000	0.5	0.605263	1.277777778	D	D	
Lake Pine Drive	Apex Barbecue Road	Old US 1	Major T-fare	19	75	60	100	2	4	As Needed	Landscaped Median	45	45	5300	14500	18000	38000	0.294444	0.381579	1.805555556	D	D	
	Apex Barbecue Road	Old US 1	Major T-fare	20	75	60	100	2	4	None	Landscaped Median	45	45	NR	17000	12000	38000	n/a	0.447368	1.416666667	-	-	
Laura Duncan Road	US 64	Versailles Drive	Major T-fare	24	69	80	100	2	4	None	TW/LTL	35	35	16900	16500	12000	32000	1.408333	0.515625	1.375	D	E	
	Old Apex Road	US 64	Major T-fare	20	75	60	105	2	4	None	Landscaped Median	45	45	6500	22500	12000	38000	0.541667	0.592105	1.875	D	D	
	US 64	Apex Peakway	Major T-fare	20	43	60	65	2	2	None	As Needed	35	35	9600	20500	12000	18000	0.8	1.138889	1.708333333	D	D	
North Mason Street	Apex Peakway	Hunter Street/Old Raleigh Road	Major T-fare	20	43	75	75	2	2	None	As Needed	35	35	7600	5000	12000	18000	0.633333	0.277778	0.416666667	D	D	
	Hunter Street/Old Raleigh Road	Center Street	Minor T-fare	20	20	40	50	2	2	None	TW/LTL	25	25	7700	5000	12000	20000	0.641667	0.25	0.416666667	D	D	
South Mason Street	Center Street	East Chatham Street	Minor T-fare	28	28	40	50	2	2	None	None	25	25	4300	3000	12000	12000	0.358333	0.25	0.25	C	C	
	East Chatham Street	NC 55/East Williams Street	Minor T-fare	19	35	50	60	2	2	None	None	25	25	NR	3000	12000	12000	n/a	0.25	0.25	-	-	
NC 55/West Williams St	Jenks Road	US 64	Major T-fare	64	69	150	150	4	4	TW/LTL	TW/LTL	45	45	35000	23500	32000	32000	1.09375	0.734375	0.734375	D	F	
	US 64	Haddon Hall Drive	Major T-fare	Varies	69	100	100	4	4	Concrete Median	Concrete Median	45	45	35900	30000	38000	38000	0.942105	0.789474	0.789473684	D	F	
	Haddon Hall																						

# Appendix D

Road Name		Street Type	Width (ft)		ROW (ft)		Lanes		Median/LT Treatment		Speed Limit (mph)		ADT		Capacity		ADT/Capacity		No Build ADT/Cap	FLOS	BLOS	BCI
From	To		2010	2035	2010	2035	2010	2035	2010	2035	2010	2035	2010	2035	2010	2035	2010	2035				
Old Raleigh Road/Lake Pine Drive	Laura Duncan Road/North Mason Street	Apex Peakway	Major T-fare	Varies	43	70	2	2	None	None	35	35	10600	6000	20000	20000	0.53	0.3	0.3		D	D
	Apex Peakway	US 64	Major T-fare	Varies	69	Varies	100	2	4	Varies	45	45	10500	17000	12000	32000	0.875	0.53125	1.416666667		D	D
Old US 1	Apex Barbecue Road	Kelly Road	Major T-fare	22	75	50	100	2	4	None	45	45	NR	20000	12000	38000	n/a	0.526316	1.666666667	-	-	-
	Kelly Road	Humie Olive Road	Major T-fare	22	75	50	100	2	4	None	45	45	3900	29000	12000	38000	0.325	0.763158	2.416666667		D	D
	Humie Olive Road	New Hill Olive Chapel Road	Major T-fare	19	30	60	70	2	2	None	45	45	2800	18000	12000	18000	0.233333	1	1.5		D	D
	New Hill Olive Chapel Road	Shearon Harris Road	Major T-fare	22	30	50	70	2	2	None	45	45	NR	12000	12000	18000	n/a	0.666667	1	-	-	-
	Shearon Harris Road	County Line	Major T-fare	22	30	60	70	2	2	None	45	45	NR	5500	12000	18000	n/a	0.305556	0.458333333	-	-	-
Olive Chapel Road	New Hill Olive Chapel Road	Richardson Road	Major T-fare	18	30	60	70	2	2	None	55	55	NR	5000	12000	18000	n/a	0.277778	0.416666667	-	-	-
	Richardson Road	Apex Barbecue Road	Major T-fare	22	43	60	70	2	2	None	45	45	NR	10000	12000	20000	n/a	0.5	0.833333333	-	-	-
	Apex Barbecue Road	Kelly Road	Major T-fare	22	43	60	70	2	2	As Needed	45	45	8900	11000	18000	20000	0.484444	0.55	0.611111111		D	D
	Kelly Road	White Dogwood Road	Major T-fare	32	75	60	100	2	4	TW/LT	45	45	6300	11000	20000	38000	0.215	0.289474	0.55		D	D
	White Dogwood Road	Apex Peakway	Major T-fare	Varies	75	60	100	2	4	Varies	45	45	9600	12500	18000	38000	0.533333	0.528947	0.694444444		D	D
Richardson Road	Apex Peakway	NC 55/West Williams Street	Major T-fare	Varies	69	60	95	2	4	Varies	45	45	7800	6000	18000	32000	0.433333	0.1875	0.333333333		D	D
	US 64	Olive Chapel Road	Major T-fare	n/a	75	n/a	100	n/a	4	Not Constructed	n/a	45	n/a	2000	n/a	38000	n/a	0.052832		-	-	-
Salem Church Road	Olive Chapel Road	Humie Olive Road	Major T-fare	21	30	60	70	2	4	None	45	45	500	4000	12000	18000	0.041667	0.222222	0.333333333		B	D
	North Salem Street	Davis Drive	Minor T-fare	18	18	60	60	2	2	None	35	35	2800	n/a	12000	12000	0.233333	n/a			D	D
North Salem Street	Salem Church Road	US 64	Major T-fare	Varies	41	60	70	2	2	Varies	45	45	9300	18500	18000	20000	0.516667	0.925	1.027777778		F	D
	US 64	Apex Peakway	Major T-fare	22	41	20	60	2	2	None	35	35	17100	21000	12000	20000	1.425	1.05	1.75		F	E
	Apex Peakway	Hunter Street	Major T-fare	36	36	50	50	2	2	None	35	35	16500	3000	12000	12000	1.375	0.25	0.25		F	E
	Hunter Street	Chatham Street	Major T-fare	36	36	50	50	2	2	None	25	25	14600	2000	12000	12000	1.216667	0.166667	0.166666667		D	D
South Salem Street	Chatham Street	NC 55/Williams Street	Major T-fare	36	36	50	50	2	2	None	25	25	6900	7500	12000	12000	0.575	0.625	0.625		D	C
	NC 55/West Williams Street	Tingen Road	Major T-fare	43	43	60	70	2	2	TW/LT	35	35	10300	9000	12000	20000	0.858333	0.45	0.75		D	C
	Tingen Road	Apex Peakway	Major T-fare	22	35	50	60	2	2	None	45	45	9000	4500	12000	18000	0.75	0.25	0.375		D	D
Schieffelin Road	Apex Peakway	Apex Barbecue Road	Major T-fare	22	75	50	100	2	4	None	45	45	NR	19000	12000	38000	n/a	0.5	1.583333333		-	-
	Energy Drive	Center Street	Minor T-fare																			
Smith Road/Stephenson	Ten Ten Road	Sunset Lake Road	Minor T-fare	19	38	60	70	2	2	None	45	45	NR	n/a	12000	20000	n/a	n/a			-	-
	Sunset Lake Road	NC 55	Major T-fare	21	75	60	100	2	4	None	45	45	7100	20500	12000	38000	0.591667	0.539474	1.708333333		D	D
Ten Ten Road	US 1/Lufkin Road	Penny Road	Major T-fare	34	75	60	100	2	4	Varies	45	45	25800	38000	20000	38000	1.29	1	1.9		E	F
	Penny Road	Kildaire Farm Road	Major T-fare	27	75	60	100	2	4	As Needed	45	45	19600	20500	12000	38000	1.633333	0.539474	1.708333333		E	F
	Tingen Road	South Salem Street	Major T-fare	22	35	60	60	2	2	None	35	35	3500	18000	12000	18000	0.291667	1	1.5		D	C
Tingen Road/Old Holly Springs Apex Rd	Apex Peakway	Jessie Drive	Major T-fare	20	30	60	70	2	2	None	45	45	1500	16000	12000	18000	0.125	0.888889	1.333333333		C	D
	Ten Ten Road	NC 55/East Williams Street	Freeway	76	76	250	250	4	4	Landscaped Median	65	65	19500	84000	64000	64000	0.304688	1.3125	1.3125		-	-
	NC 55/East Williams Street	New Hill Holliman Road	Freeway	79	79	250	250	4	4	Landscaped Median	65	65	19500	72000	64000	64000	0.304688	1.125	1.125		-	-
US 64	New Hill Holliman Road	New Hill Holliman Road	Freeway	76	76	250	250	4	4	Landscaped Median	65	65	NR	72000	64000	64000	n/a	1.125	1.125		-	-
	New Hill Olive Chapel Road	Jenks Road	T-fare	78	78	200	200	4	4	Landscaped Median	55	55	21000	64000	38000	64000	0.552632	1	1.884210526		D	E
	Jenks Road	Kelly Road	T-fare	78	78	200	200	4	4	Landscaped Median	55	55	20000	59000	38000	64000	0.526316	0.921875	1.552631579		D	E
	Kelly Road	NC 55/West Williams Street	T-fare	78	78	200	200	4	4	Landscaped Median	55	55	28000	54000	38000	50000	0.738842	1.08	1.421052632		D	E
	NC 55/West Williams Street	North Salem Street	T-fare	78	78	200	200	4	4	Landscaped Median	55	55	38500	59000	38000	50000	1.013158	1.18	1.552631579		E	F
Wimberly Road	North Salem Street	Laura Duncan Road	T-fare	78	78	230	230	4	4	Landscaped Median	55	55	37000	55000	38000	50000	0.973684	1.1	1.447368421		E	F
	Laura Duncan Road	Lake Pine Drive	T-fare	78	78	230	230	4	4	Landscaped Median	55	55	36000	53000	38000	50000	0.947368	1.06	1.394736842		D	F
	Green Level West Road	Jenks Road	Major T-fare	21	30	60	100	2	2	None	55	55	1000	10500	12000	18000	0.083333	0.583333	0.875		C	D
Woods Creek Road	Friendship Road	Old Holly Springs Apex Road	Major T-fare	20	30	60	70	2	2	None	45	45	NR	n/a	12000	12000	n/a	n/a			-	-
	Apex Peakway	Beaver Creek Commons Drive	Minor T-fare	Varies	35	Varies	60	2	2	As Needed	25	25	2000	2000	3000	18000	0.666667	0.111111	0.666666667		C	C

# Appendix D

## Roadway Typical Sections

	Width* (ft)	Right-of-Way (ft)	Type	Median/LT treatment	Sidewalk	Multi-use path	On-road cycling	Example section or general category
One travel lane each direction	18-22 Var.	50-60 Var.	EOP with shoulders	LTs as needed	5' both sides	none	With traffic	Center St - N. Mason to Apex Pewy.
	27	50	Curb and gutter	None	5' one side	none	With traffic	<b>Minor residential street standard</b>
	27	60	Curb and gutter	None	5' both sides	none	With traffic	<b>Minor collector street standard</b>
	30	70	EOP with shoulders	LTs as needed	5' one side	10' one side	3' paved shoulders	Humie Olive Rd. - Richardson Rd. to Old US 1
		100**	EOP with shoulders	LTs as needed	5' both sides	none	3' paved shoulders	Apex Barbecue Rd. - Kelly Rd. to Old US 1
	32	60	Curb and gutter	None	5' both sides	none	With traffic	<b>Old collector street standard</b>
	35	60	Curb and gutter	As needed	5' one side	none	With traffic	<b>Major residential street standard</b>
	35	60	Curb and gutter	LTs as needed	5' both sides	none	15' travel lanes	<b>NCDOT minimum curb and gutter section; major collector standard</b>
	38	70	EOP with shoulders	TWLTL	5' both sides	none	With traffic	Smith Rd./Stephenson Rd. - Ten-Ten Rd. to Sunset Lake Rd.
		80	EOP with shoulders	TWLTL	5' one side	10' one side	With traffic	Old Jenks Rd. - NC 55 to Davis Dr.
	41	70	Curb and gutter	TWLTL	5' both sides	none	With traffic	N. Salem St. - US 64 to Apex Pewy.
43	70	Curb and gutter	TWLTL	5' both sides	none	13' outside lanes	<b>3-lane thoroughfare standard</b>	
Two travel lanes each direction	65	90	Curb and gutter	12' Landscaped Median	5' one side	10' one side	With traffic	Apex Pewy. - reduced section
	69	100	Curb and gutter	TWLTL	5' both sides	none	With traffic	<b>Old 5-lane thoroughfare standard</b>
	71	100	Curb and gutter	18' Landscaped Median	5' one side	10' one side	With traffic	Apex Pewy. - standard section
	75	100	Curb and gutter	18' Landscaped Median	5' both sides	none	14' outside lanes	<b>4-lane median-divided thoroughfare standard</b>
Three travel lanes each direction	89	110	Curb and gutter	TWLTL	5' both sides	none	With traffic	NC 55 - US 1 to NC 55 Bypass

\*Roadway widths are back-to-back for curb and gutter and edge-to-edge for shoulder sections

\*\*Provides for long term potential of widening to 75' 4-lane median divided roadway

Special note: does not include US routes and does not include all variations of existing and planned roadways in Apex