4.0 Needs and Opportunities

4.1 Diverse Transportation Benefits[1]

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

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

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

1 - 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 Unites 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

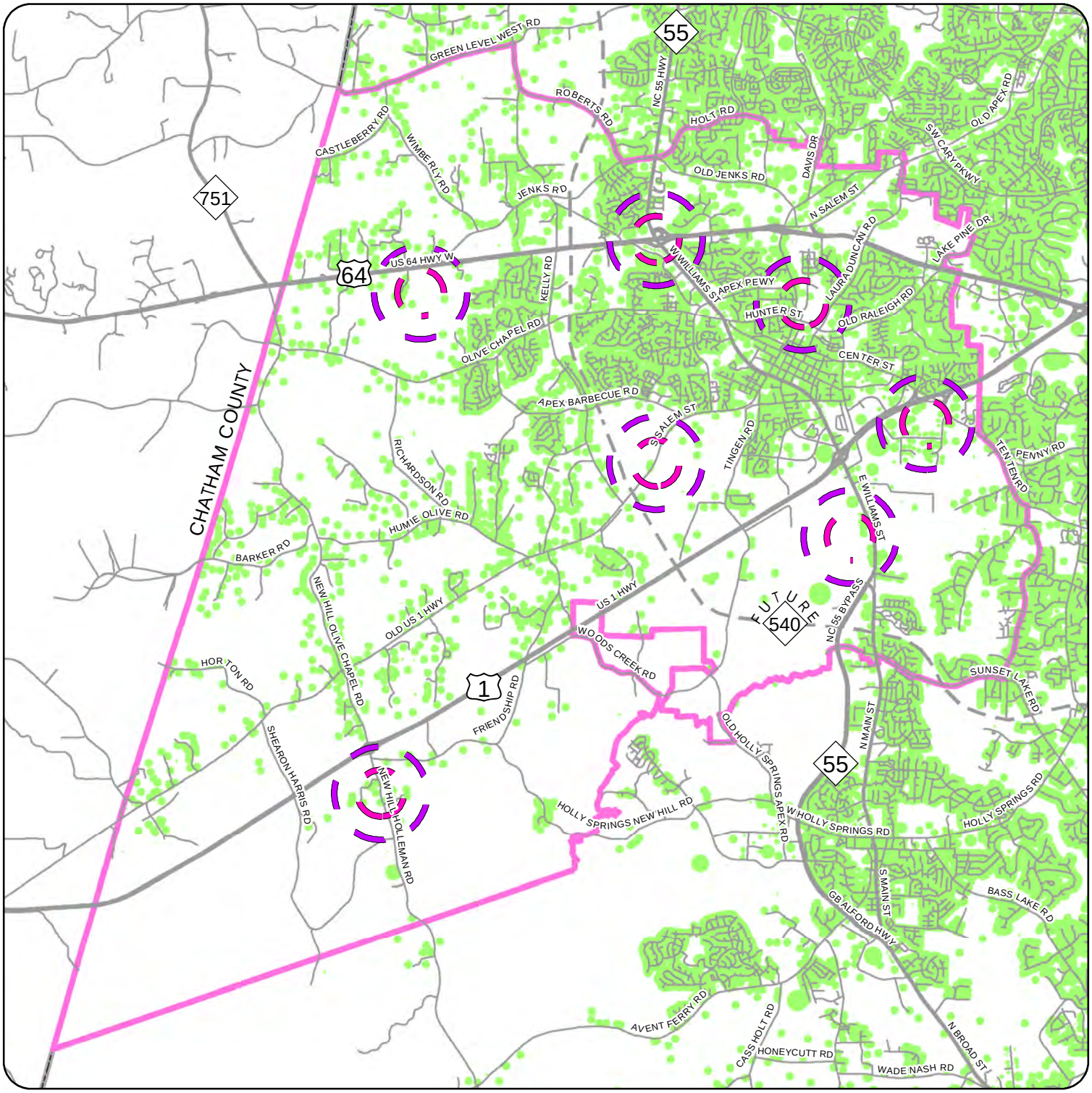

Figure 4.1
Growth Areas

0 0.5 1 2 Miles

- Existing Building
- Activity Center ¼-Mile
- Activity Center ½-Mile
- Study Area
- County Line
- Street

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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.

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Figure 4.2 -- Apex 10-year Population Growth Rates

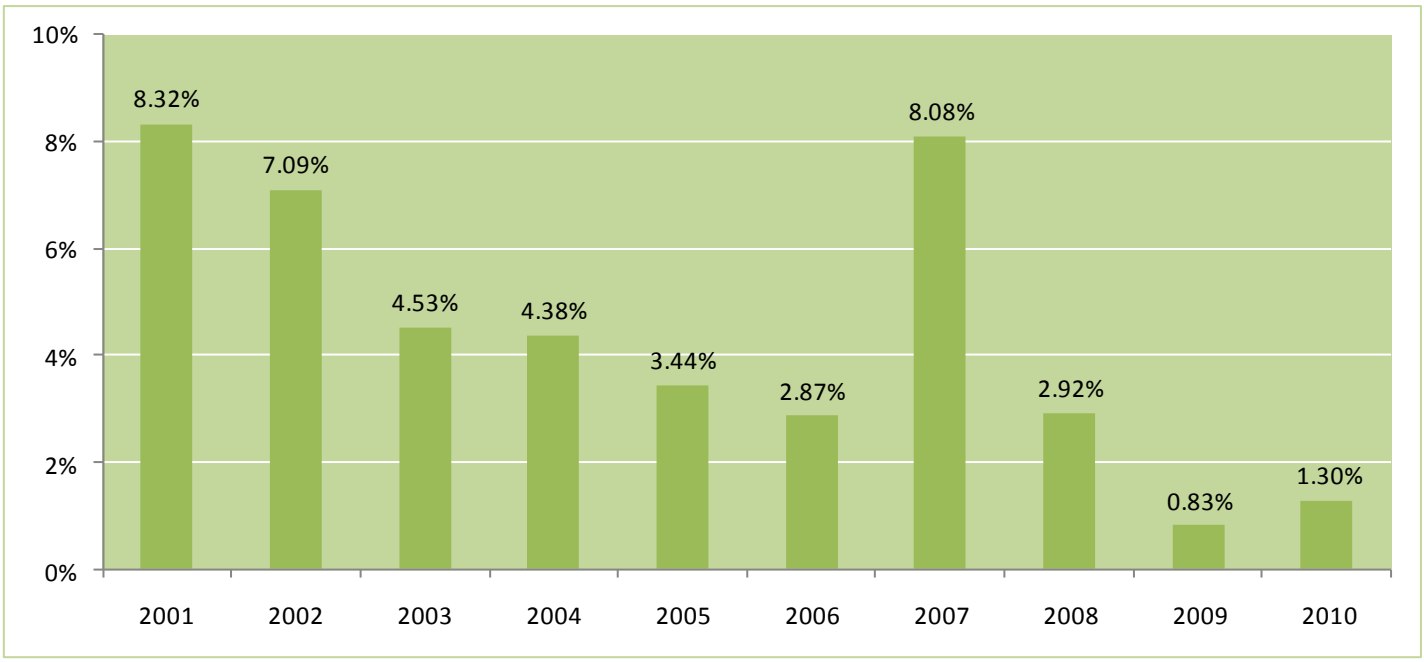
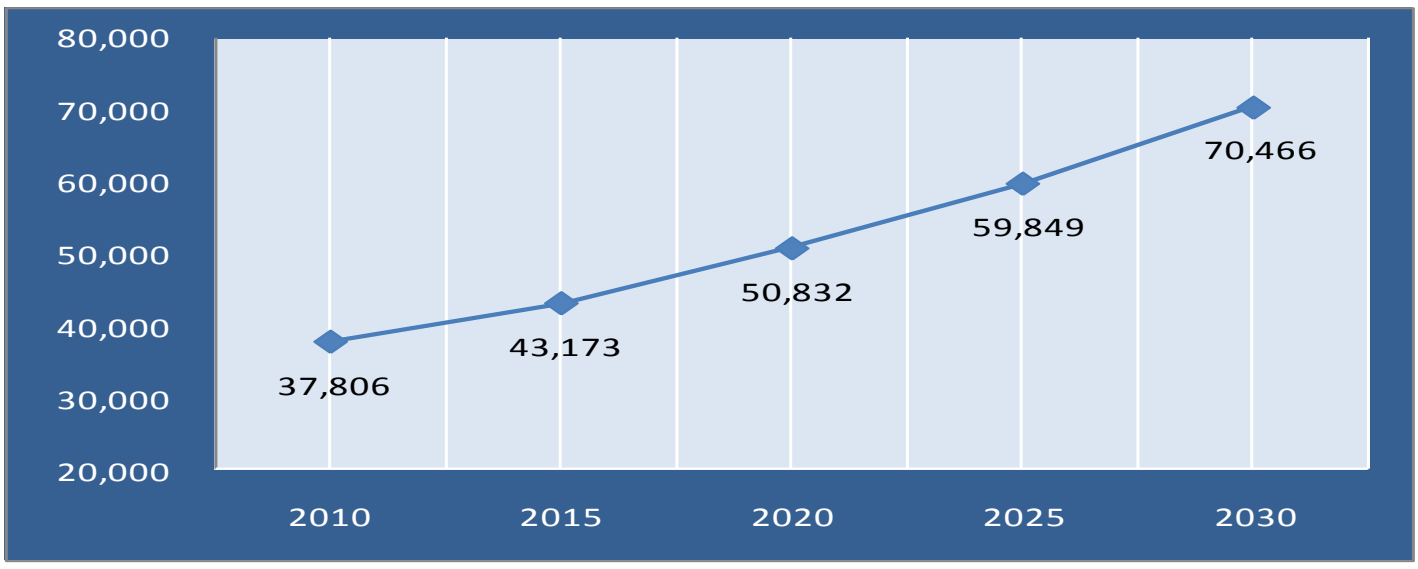


Figure 4.3 -- Apex Population Projection from 2010 - 2030



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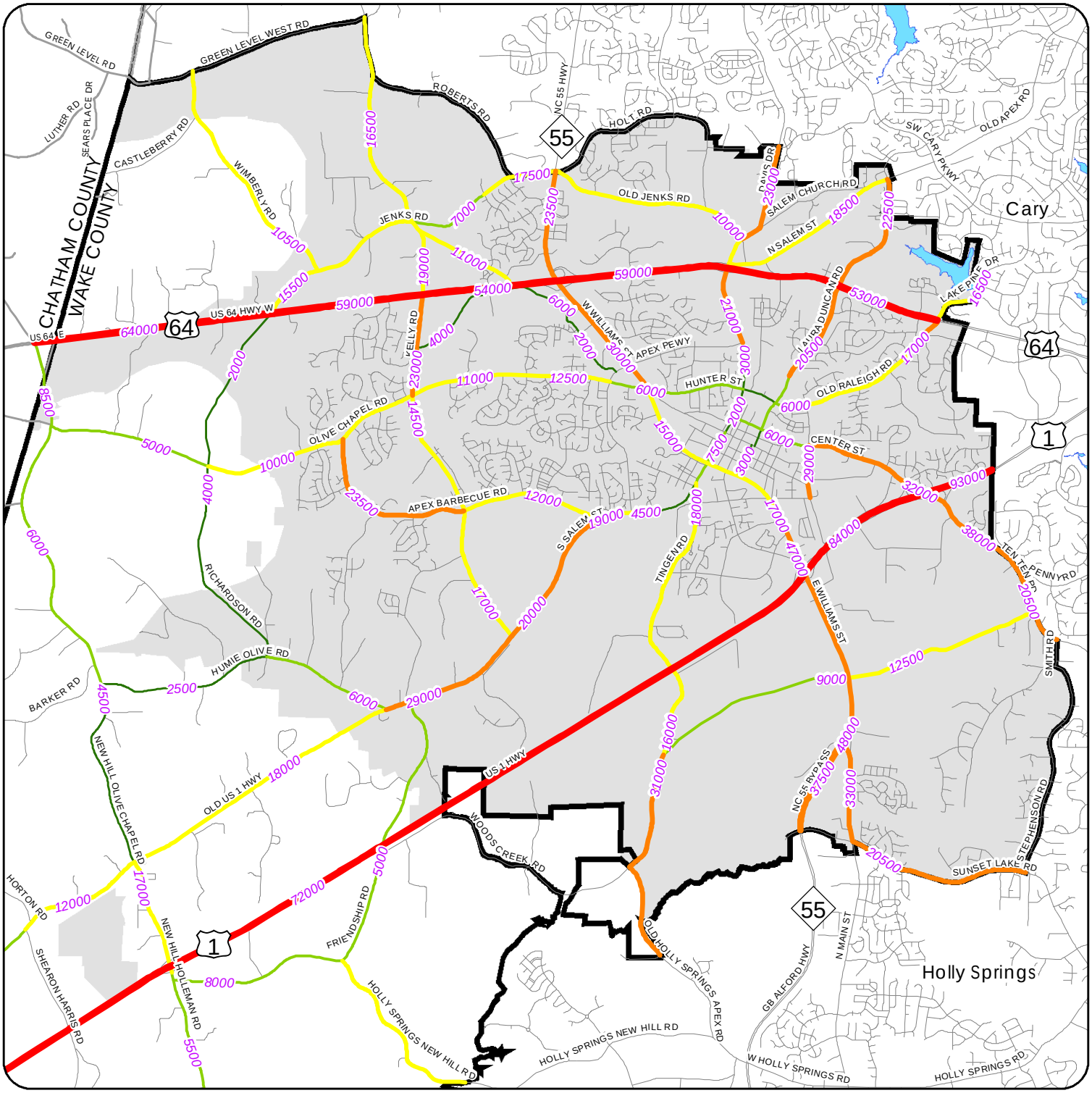

Figure 4.4
2035 Projected Daily Traffic Volume

0 0.5 1 2 Miles

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

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4.2.4 Environmental Features

Environmental features play an important role in the location of transportation facilities and the feasibility and cost of constructing the facility. While the recommendations in this plan are somewhat general and are subject to realignment during detailed analysis and design when site plans are created, careful consideration of environmental issues at an early stage can help ensure that the recommendations of this plan are feasible.

Environmental features that are considered when evaluating recommended transportation facilities include:

- Water bodies
- Floodplains
- Stream buffers
- Steep terrain

A map showing these environmental features is included in **Figure 4.5**. When site plans are submitted a detailed analysis of the environmental impact of a facility should be conducted beyond the general review at the town-wide level.

4.2.5 Infrastructure

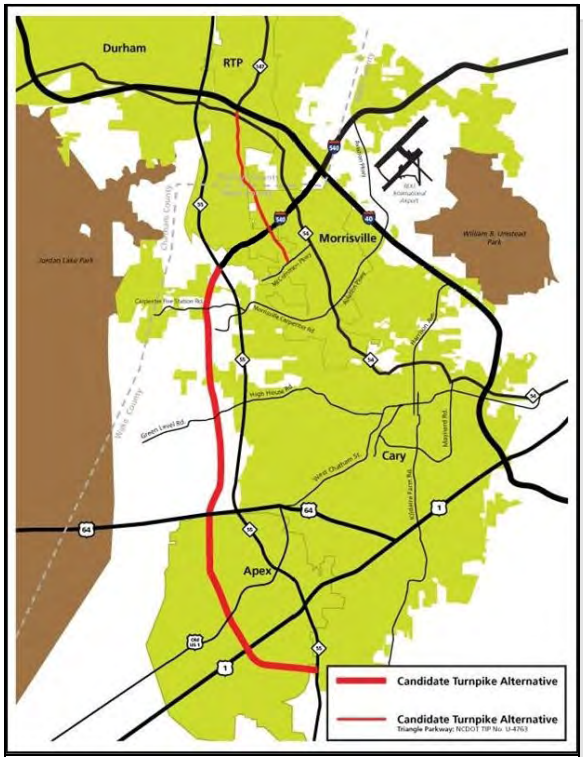
Major transportation projects are planned in and around Apex that will shape the future growth for the region and transportation planning for the Town. Projects currently being planned include:

- Western Wake Freeway/NC540
- US 64 Conversion to Expressway/Freeway
- Apex Peakway

Western Wake Freeway

The Western Wake Freeway is a component of Triangle Expressway that forms the western portion of the 540 Outer Loop. This section of the Triangle Expressway extends from NC 55 near Morrisville south to NC 55 Bypass near Holly Springs (12.6 miles) with a construction cost of $784 million.

The Western Wake Freeway will be a toll facility constructed by the North Carolina Turnpike Authority (NCTA) that will provide, among other benefits, a freeway link between communities south of Apex and the Research Triangle Park.



The proposed route for the Western Wake Freeway would provide a major north-south route near Apex. *Source: http://ncturnpike.org/*

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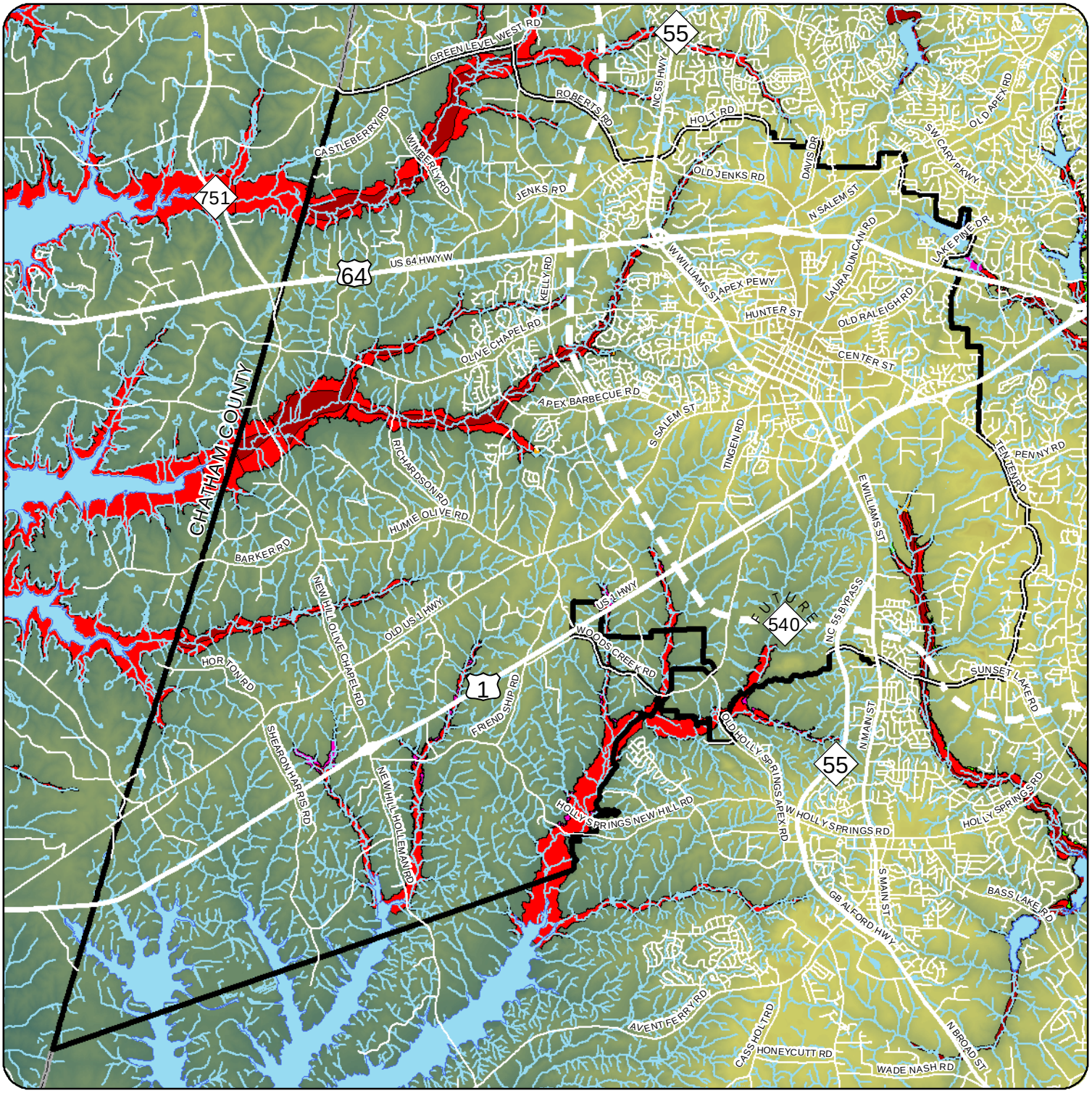

Figure 4.5

Environmental Features

0 0.5 1 2 Miles

Elevation: High – Low

- 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

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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:

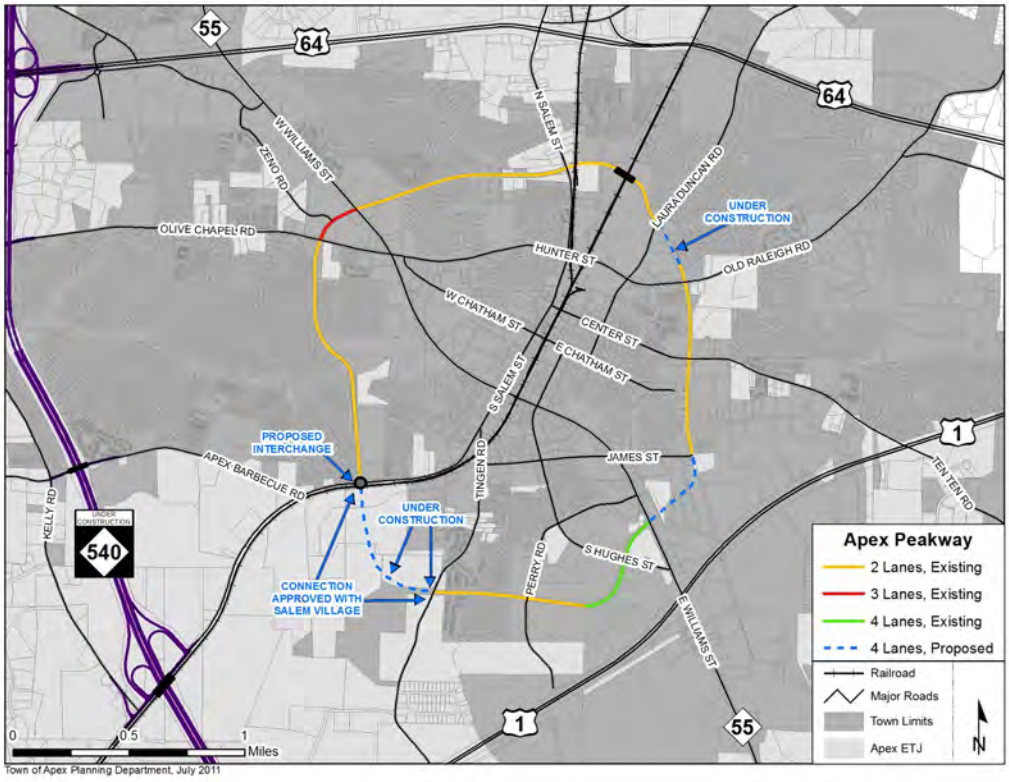
http://www.ncdot.org/doh/preconstruct/tpb/SHC/studies/US64/Report/

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.

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

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.



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**.

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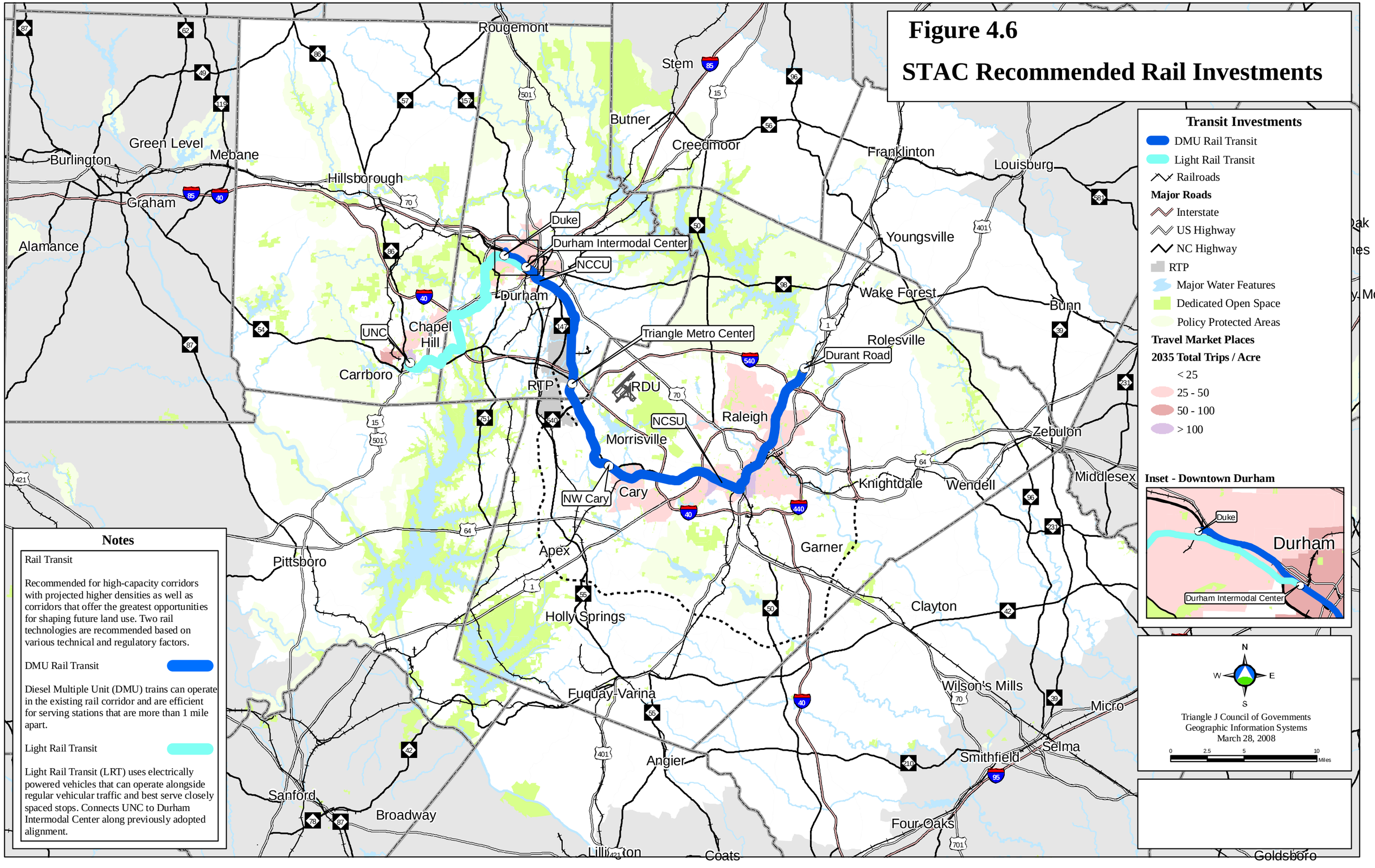
Figure 4.6

STAC Recommended Rail Investments



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.

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

Inset - Downtown Durham

N
W E
S

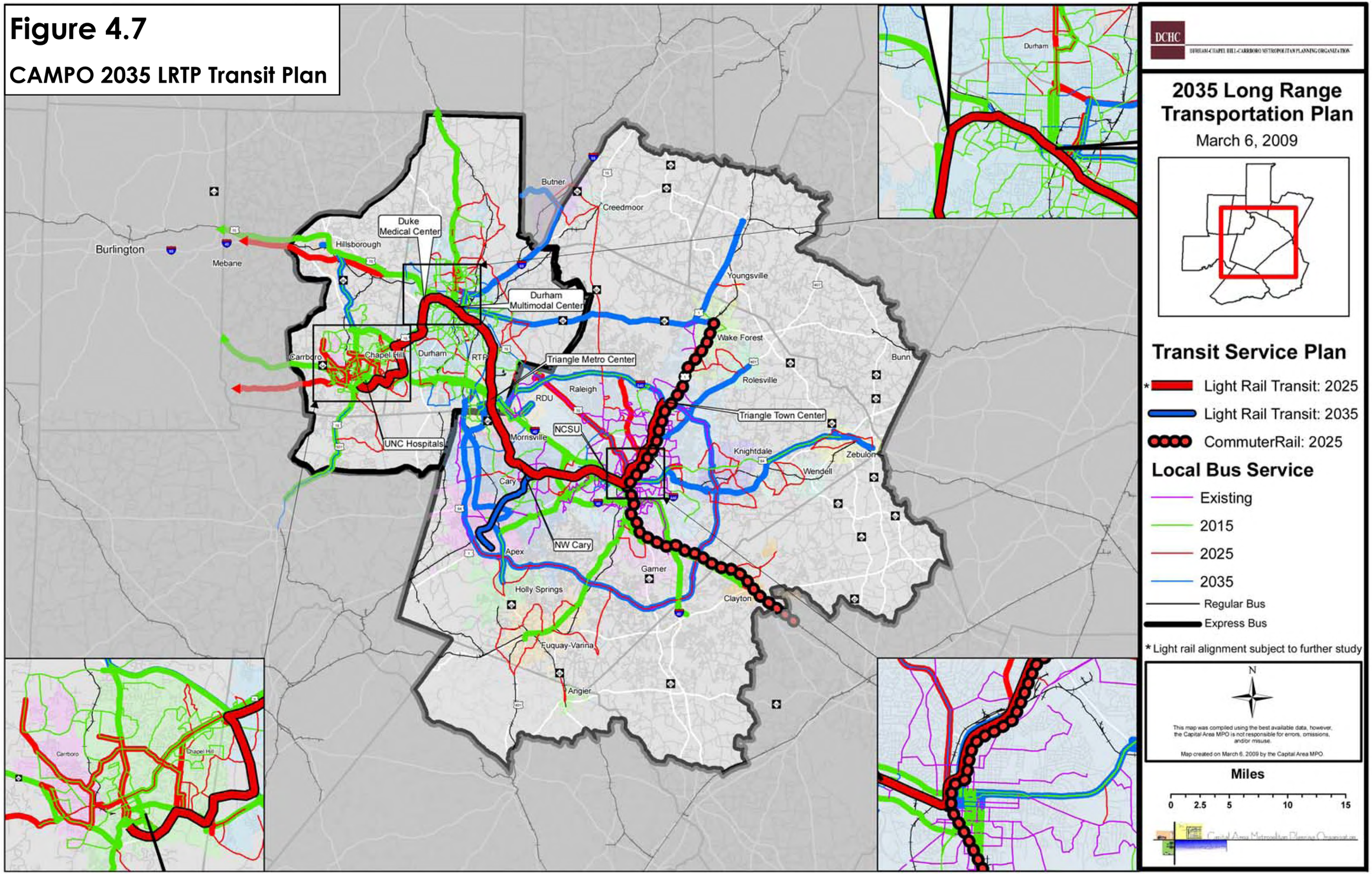
Triangle J Council of Governments
Geographic Information Systems
March 28, 2008

0 2.5 5 10 Miles

Apex Transportation Plan

Figure 4.7

CAMPO 2035 LRTP Transit Plan



Apex Transportation Plan