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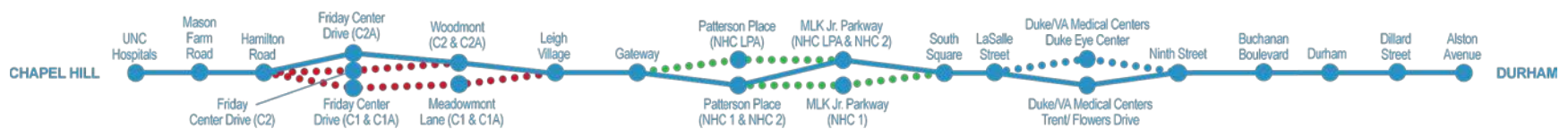
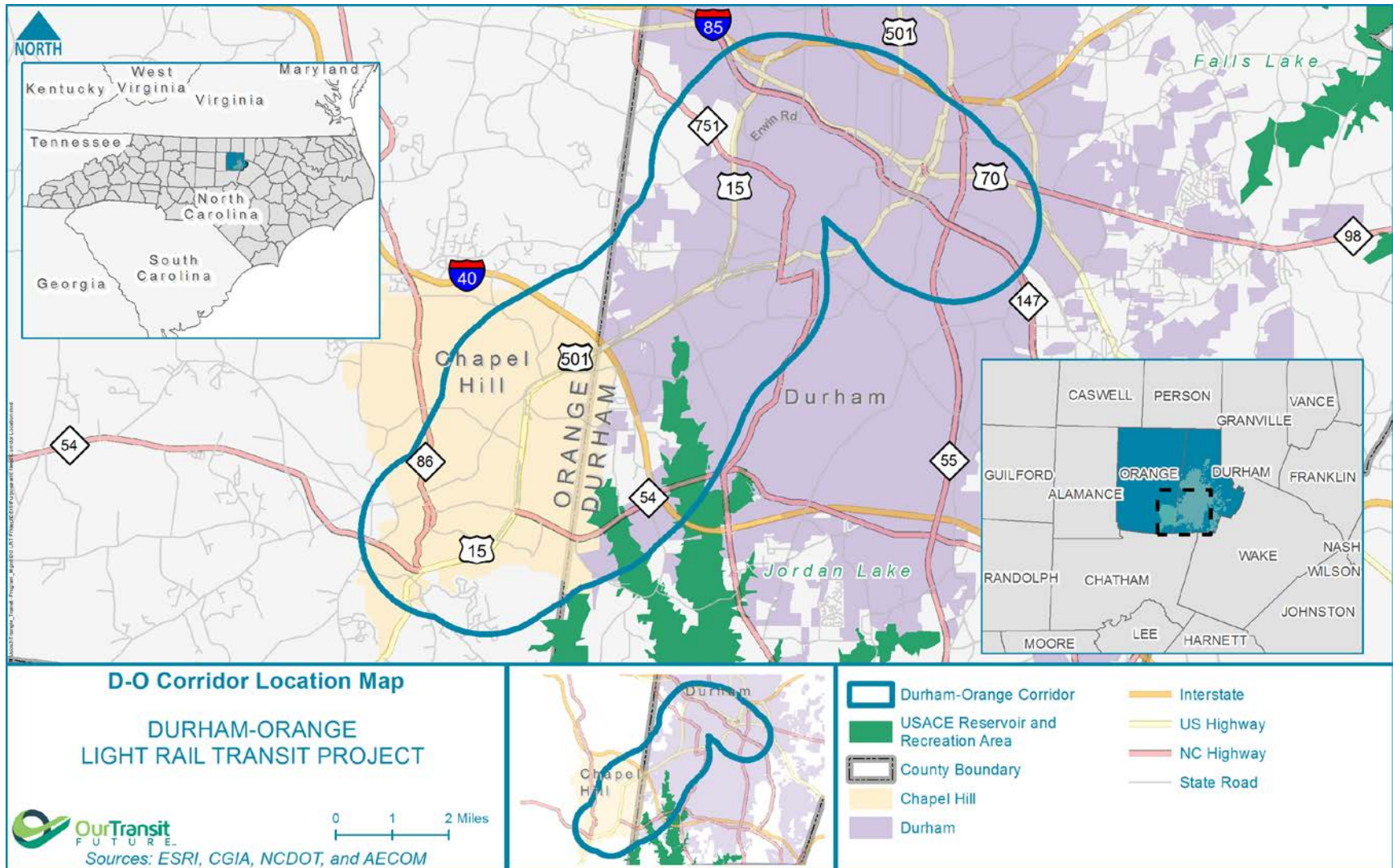
Purpose and Need

Research Triangle Regional Public Transportation Authority d/b/a Triangle Transit d/b/a GoTriangle (Triangle Transit), in cooperation with the Federal Transit Administration (FTA), prepared this Draft Environmental Impact Statement (DEIS) pursuant to the National Environmental Policy Act (NEPA) to evaluate a potential high-capacity transit improvement within the Durham-Orange (D-O) Corridor between Chapel Hill and Durham. This chapter provides an overview of the proposed D-O Light Rail Transit (LRT) Project, describes the purpose of the proposed project, and explains the need for transportation

improvements within the D-O Corridor (**Figure 1.0-1**).

The purpose of the proposed project is to provide a high-capacity transit service within the D-O Corridor, between Chapel Hill and Durham, along the NC 54, I-40, US 15-501, Erwin Road, and NC 147 transportation corridors, that improves mobility, expands transit options, and supports future development plans.

Figure 1.0-1: D-O Corridor Location Map



1.1 Research Triangle Region

The Research Triangle is a region in the Piedmont of North Carolina anchored by the University of North Carolina at Chapel Hill (UNC), Duke University (Duke), North Carolina Central University (NCCU), North Carolina State University, and the municipalities of Chapel Hill, Durham, Cary, and Raleigh (the state capital). Triangle Transit, the regional transportation authority serving Durham, Orange, and Wake counties, is responsible for creating, planning, financing, organizing, and operating a regional public transportation system for the Triangle region.

The population of the three-county area of Orange, Durham, and Wake counties has grown 30 percent in each of the last three decades and is expected to grow another 80 percent by 2040 (Durham-Chapel Hill-Carrboro [DCHC] Metropolitan Planning Organization [MPO] and Capital Area Metropolitan Planning Organization [CAMPO], *2040 Metropolitan Transportation Plan* [MTP] Socioeconomic Data). Despite the recent economic downturn, the region has continued to grow due to its strong economic base. The Triangle's economy is driven by the presence of state and local government offices, universities and colleges, medical centers, and research and development industries. The region is home

to more than a dozen primary industries, including biotechnology, pharmaceuticals, clean technology, smart grid technology, and information technology, as well as global Fortune 100 companies and the Research Triangle Park (RTP) (RTP, 2015). In 2012, Durham and Chapel Hill had the sixth highest real gross domestic product (GDP) per capita of any metropolitan area in the United States (Bureau of Economic Analysis, 2013).

The Triangle is comprised of two urbanized areas (UZA) and is thus under the purview of two MPOs, the CAMPO and the DCHC MPO. CAMPO covers the eastern UZA of the Triangle region and includes all of Wake County and portions of Franklin, Granville, Harnett, and Johnston counties, including 18 municipalities within these 5 counties. The DCHC MPO is responsible for the western UZA of the Triangle covering all of Durham County; a portion of Orange County including the towns of Chapel Hill, Carrboro, and Hillsborough and a small portion of southwest Granville County and northeast Chatham County. The D-O Corridor is located within the DCHC MPO UZA.

Rapid growth is outpacing the Triangle's ability to repair, replace, and expand its highways and bridges. The key highways under the purview of the DCHC MPO include Interstate 40 (I-40), Interstate 85 (I-85), United States (US) Highway 15-501 (US 15-501), US Highway 70 (US 70), NC

Highway 54 (NC 54), NC Highway 55 (NC 55), and NC Highway 147 (NC 147), all of which experience congestion during morning and evening commute times. As a result, average travel speeds within the region are expected to decrease, further limiting the mobility of Triangle residents and visitors. Given these mobility constraints, the Triangle is embracing alternative transportation options as exemplified by a 140 percent increase in Triangle Transit's bus ridership between Triangle Transit fiscal years (FY) 2005 and FY 2014.

1.1.1 Durham-Orange Corridor

The D-O Corridor extends roughly 17 miles from southwest Chapel Hill to eastern Durham and includes several educational, medical, and other key activity centers, which generate a large number of trips each day. These activity centers include (**Figure 1.1-1**):

- Colleges and universities including UNC, Duke, NCCU, and Durham Technical Community College (DTCC)
- Major medical facilities, including UNC Hospitals, Durham Veterans Affairs (VA) Medical Center, and Duke Medical Center

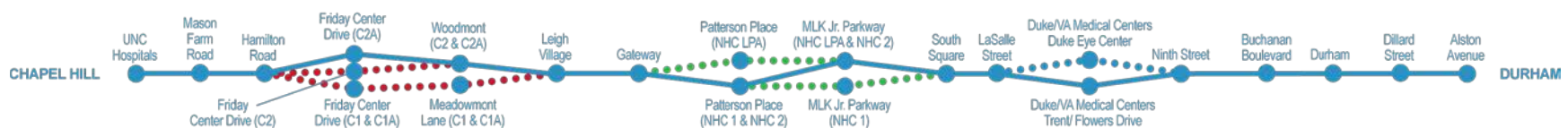
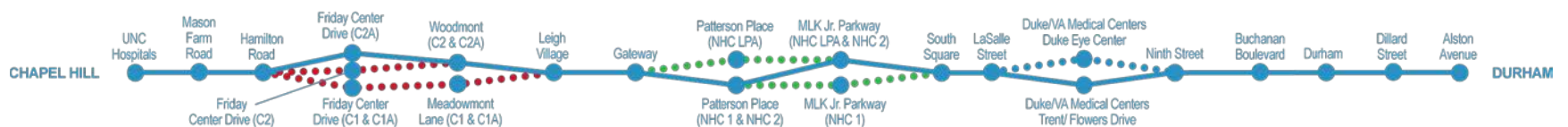
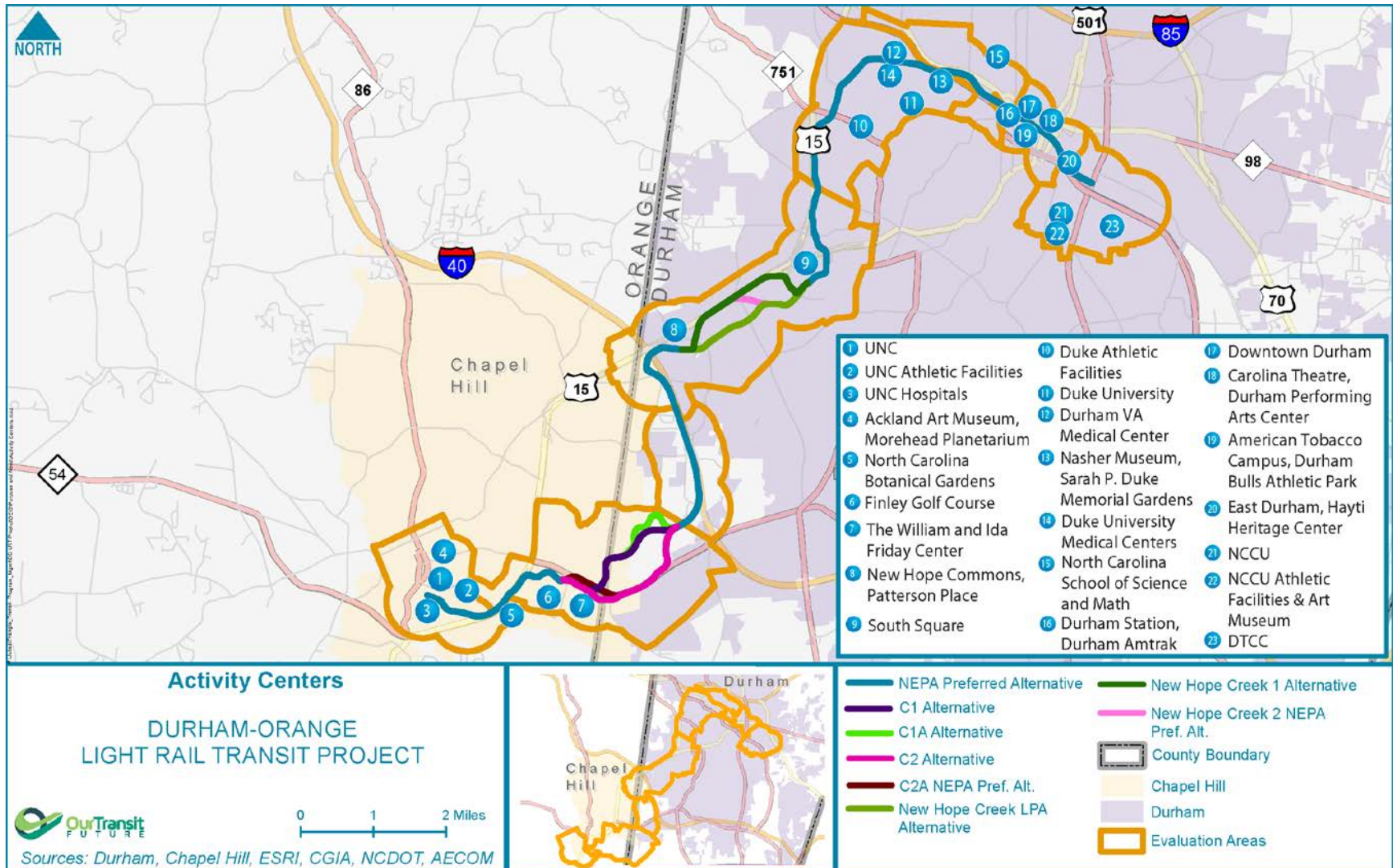


Figure 1.1-1: Activity Centers in the D-O Corridor



- Employment centers, including not only the area universities and medical facilities but also multiple mixed-use office and retail destinations, including Patterson Place, South Square, the American Tobacco Campus, and downtown Durham
- Major athletics facilities at UNC (Dean E. Smith Center, Kenan Memorial Stadium, Carmichael Arena, Finley Golf Course), Duke (Cameron Indoor Stadium, Wallace Wade Stadium, Washington Duke Golf Club), downtown Durham (Durham Bulls Athletic Park, home of the AAA Durham Bulls), and NCCU (O’Kelly-Riddick Stadium, McDougald-McClendon Gymnasium)
- Major arts and cultural facilities, including the Ackland Art Museum, Morehead Planetarium, Memorial Hall, NC Botanical Gardens, the William and Ida Friday Center for Continuing Education (Friday Center), Nasher Museum of Art, Sarah P. Duke Memorial

Gardens, Carolina Theatre, Durham Performing Arts Center, Hayti Heritage Center, and the NCCU Art Museum

- Major transportation hubs like Durham Station (serving intercity, local, and regional bus service) and Durham Amtrak Station

Within the D-O Corridor, population growth and cultural and economic diversity are even more pronounced than in the Triangle region overall. In fact, according to 2007-2011 American Community Survey estimates, census tracts located within the corridor feature a median household income of \$41,696, which is 19 percent lower than the regional figure of \$51,490 for Durham and Orange counties. In addition, over 13 percent of households in the corridor have no vehicle available and 42.6 percent have just one vehicle available, as compared to 8.1 percent and 36.7 percent, respectively, in the counties of Durham and Orange.

Between 2010 and 2040, the population of each county is expected to grow by 64

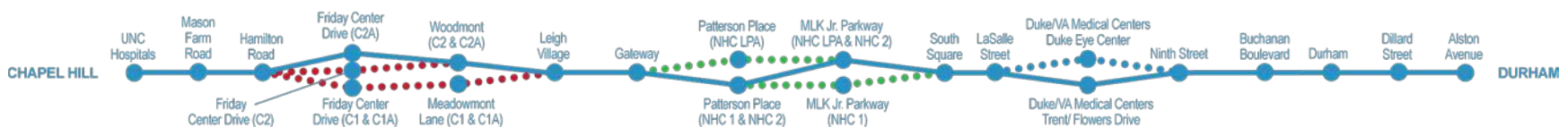
percent and 52 percent, respectively (**Table 1.1-1**). The D-O Corridor is located in the heart of the forecasted growth area, and the corridor’s population is expected to double during the same timeframe, outpacing the projected growth of the Triangle as a whole. This growth is spurred by UNC, Duke, their respective medical centers (both of which are Level I trauma centers), the Durham VA Medical Center, NCCU, DTCC, and downtown Durham.

Existing and forecasted populations illustrate transit ridership potential in the densely populated locations along the D-O Corridor. Growth is projected to be concentrated within Chapel Hill and the westernmost sections of Durham, which are closest to Chapel Hill and I-40. Much of this growth can be attributed to increased residential development for employees and students at UNC to keep pace with rising student enrollment. In 2007, UNC had just over 28,000 students and by 2017 total enrollment is projected to reach 33,000 students, a net increase of 18 percent.

Table 1.1-1: Forecasted Population Growth

	2010	2040	Percent Change
Durham County	258,000	422,000	64%
Orange County	129,000	197,000	52%
D-O Corridor	27,000	54,000	100%

Source: DCHC MPO 2012.



Durham will absorb some of this increased residential development in locations such as the planned Leigh Village development, as well as new commercial development. Downtown Durham will also continue to develop and prosper. While already home to a significant number of jobs in government, hospitality, and banking, several new development projects from \$10 million to \$200 million are planned, and the downtown's renaissance is spurring infill development in adjacent neighborhoods.

will also result in sprawling development patterns, which would lead to the reduction of open space and farmlands. Local land use plans call for focused, compact development to manage future growth and reduce the likelihood of sprawl, but these plans require a high-quality transportation infrastructure solution to support the development (**Figure 1.1-2**). For more information on land use, see DEIS section 4.1.

1.1.2 Transportation Challenge

Continued population and employment growth in the region, and more specifically in the D-O Corridor, is straining the already congested roadway network: I-40, US 15-501, NC 54, NC 147, and Erwin Road. This results in increased travel times and reduced reliability of the transportation system between Chapel Hill and east Durham as discussed in DEIS chapter 3. These roadways provide access for residents, visitors, and the workforce travelling to the major activity and employment centers within the corridor whose populations have a high propensity for transit use. The existing built and natural environments limit the ability to widen the roadways to accommodate additional travel lanes, which could meet the increasing mobility needs as the population continues to grow. If left unmanaged, this rapid growth will not only continue to constrain corridor mobility, but

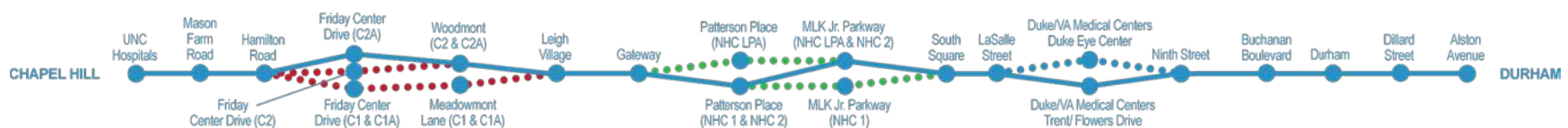
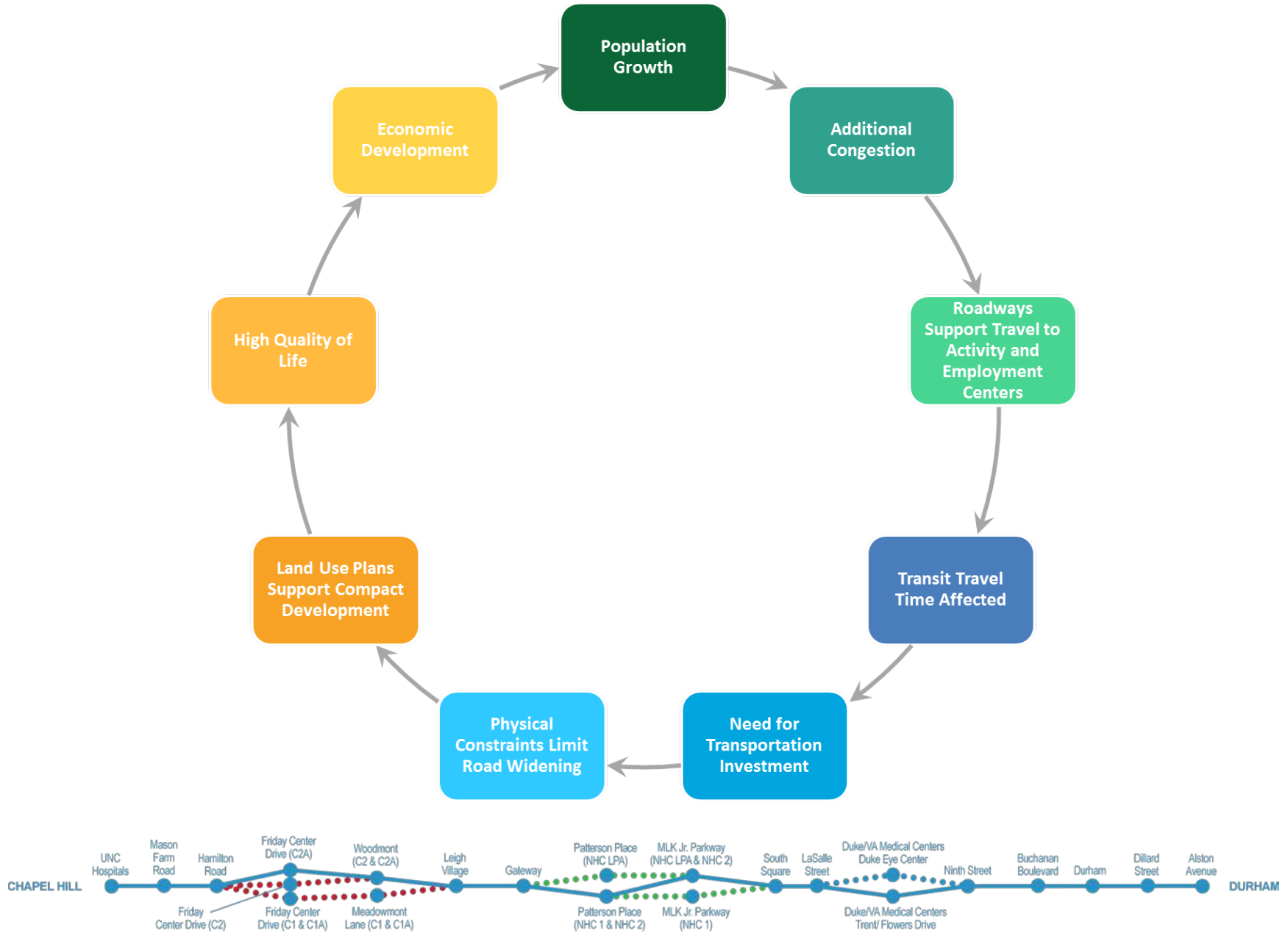


Figure 1.1-2: Transportation Challenge



1.2 D-O Corridor Setting

This section describes the physical and natural setting of the D-O Corridor that supports the proposed project’s purpose and need.

1.2.1 Land Use and Activity Centers

The D-O Corridor is located within the Triangle region (**Figure 1.2-1**). It extends roughly 17 miles from southwest Chapel Hill to east Durham, and includes several educational, medical, and other key activity centers that generate a large number of trips each day (**Figure 1.3-1**). The land uses in the D-O Corridor are supported by a network of major highways, including NC 54, I-40, US 15-501, Erwin Road, and NC 147.

1.2.2 Employment

Population growth in the D-O Corridor is spurred by major employers such as UNC and Duke, their respective medical centers, the Durham VA Medical Center, NCCU, DTCC, Blue Cross Blue Shield of North Carolina, and the downtown Durham central business district.

According to the US Census, in 2010 there were 71,000 jobs in Orange County and 190,100 in Durham County. The total number of jobs in all the proposed station areas was 75,000, or 29 percent of the jobs in both counties combined. Currently, the

D-O Corridor has more than 150,000 employees and students.

In 2040, the proposed station area employment is expected to grow to roughly 119,000 jobs, which would represent approximately 28 percent of the total jobs in Durham and Orange counties combined. The increase in the number of jobs will require the movement of people throughout the city and increasingly from station to station while connecting walkable suburban neighborhoods with multiple activity centers within the D-O Corridor.

1.2.3 Household Characteristics

According to the US Census, there were 55,900 housing units in Orange County and 118,700 in Durham County in 2010. The total number of housing units in all the proposed station areas was 15,500, or 9 percent of the housing units in Orange and Durham counties combined. DEIS section 4.2 provides specific estimates of population, housing, and employment at the station area level.

As noted earlier, the Durham-Chapel Hill Metropolitan Statistical Area outperforms larger metropolitan areas like Washington, D.C., Seattle, Boston, Houston, and Charlotte in per capita real GDP (the economic output of a locality per person taking out the effect of inflation). However, according to 2007-2011 American Community Survey estimates, census tracts

located within the D-O Corridor have a median household income of \$41,696, which is 19 percent lower than the combined median household income of \$51,490 in Durham and Orange counties. Over 13 percent of households in the corridor have no vehicle available and 42.6 percent have just one vehicle available, as compared to the respective 8.1 percent and 36.7 percent in the counties of Durham and Orange. The economic disparity and high prevalence of mobility-challenged households within the D-O Corridor supports the need for more robust transportation options.

1.2.4 Other Characteristics Leading to Likely Transit Use

University students, university employees, and transit-dependent populations make up a large portion of the travelers in the D-O Corridor. The university campuses and medical centers offer pedestrian-friendly environments, limited parking, and transit passes. The presence of these populations along with the campus and medical center characteristics provide the base for high transit use in the corridor.

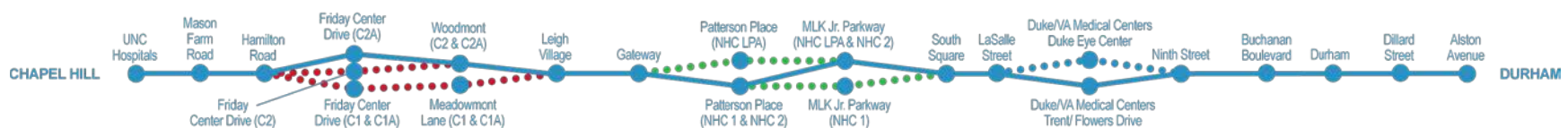
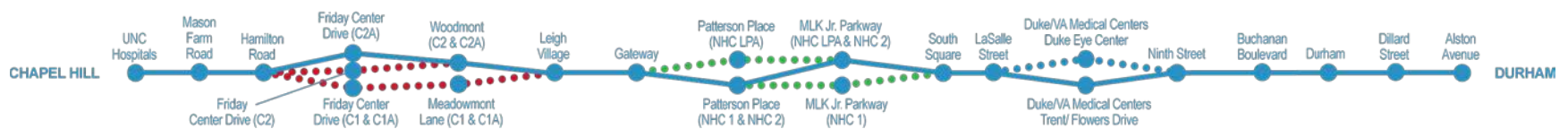
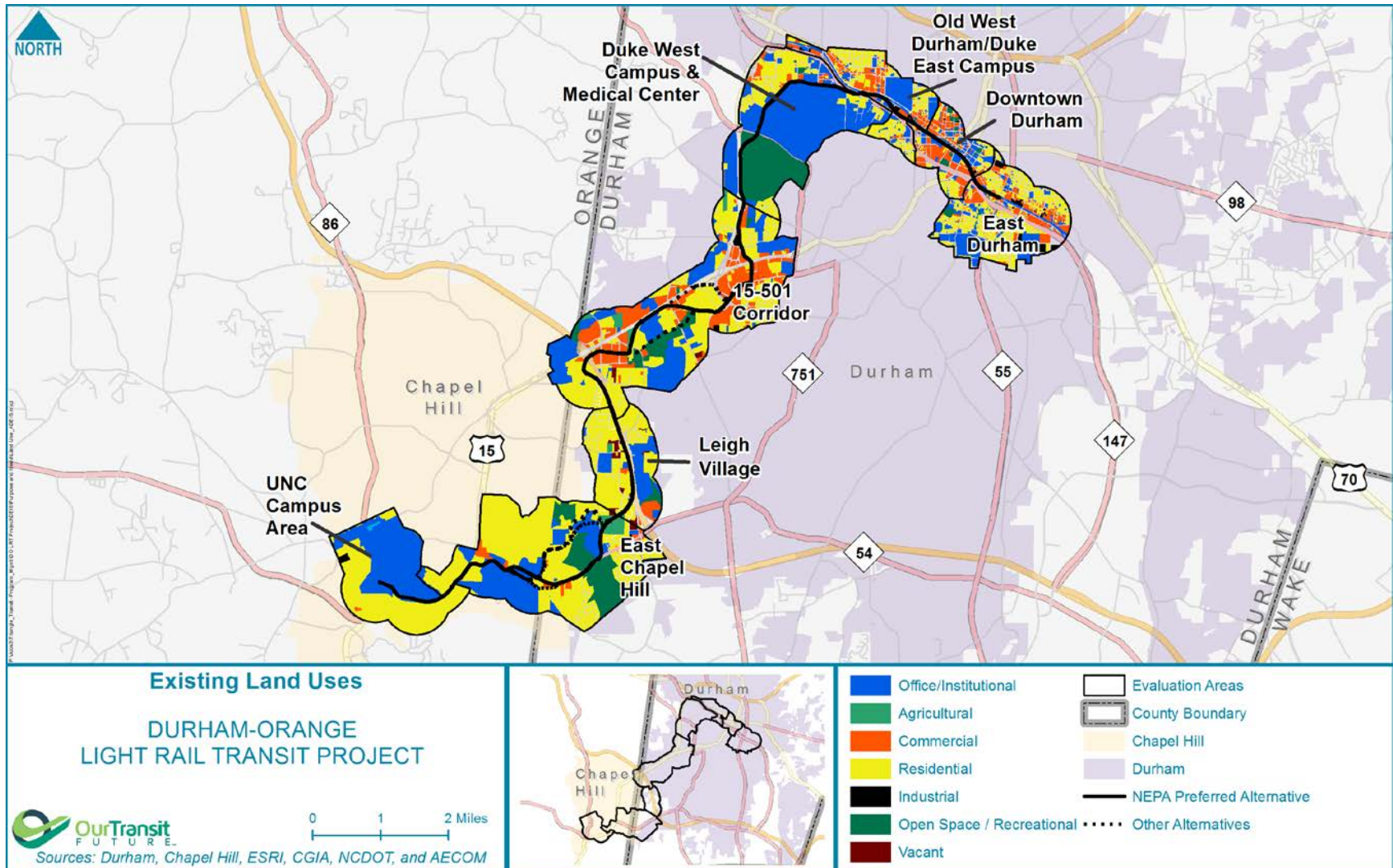


Figure 1.2-1: Existing Land Uses in the D-O Corridor



1.3 Transportation System

1.3.1 Existing Road Network

The existing roadway network experiences high levels of congestion, which will increase in severity with rises in population and employment within the D-O Corridor. The majority of the current travel demand on the existing transportation system focuses around trips between Chapel Hill and Durham and the many activity centers within and between these municipalities, as illustrated on **Figure 1.1-1**. DEIS section 3.2 discusses the regional travel patterns and existing roadways in more detail.

1.3.2 Existing Transit Network

Over the past 10 years, Triangle Transit increased bus ridership by more than 140 percent adding more than a million additional trips from 2005 to 2014 (**Figure 1.3-2**).

Due to the growing levels of congestion within the D-O Corridor, it is becoming difficult to maintain schedule adherence and consistency in travel times for bus routes in the corridor. On-time performance for weekday regional routes operating within the D-O Corridor is equal to or worse than the overall Triangle Transit system average (**Table 1.3-1** and **Figure 1.3-3**).

To better understand the trips within the D-O Corridor, data from the Triangle Regional

Transportation Demand Model is used to identify the location of the major activity centers within the corridor that are driving trip generation within the study area. **Figure 1.5-3** illustrates travel intensity expressed as trips per square mile. Transportation improvements that target those high intensity areas would be the most effective in serving the greatest number of trips.

Another important concept when evaluating trips within the corridor is to understand where trips begin and where they end. Unlike many other areas where most trips flow from suburban/residential areas into downtown in the morning and in the opposite direction in the afternoon, many more trips occur within and between travel subareas in the D-O Corridor. This is true for both the 2010 base year and the 2040 forecast year.

Travel between activity centers and multiple trip origins and destinations within the D-O Corridor illustrate the current travel market and future travel challenges of the Triangle region. **Figure 1.3-4** illustrates projected daily trips in 2040 between subareas within the D-O Corridor. As the map indicates, the highest intra-corridor travel occurs in both directions between Duke and downtown Durham subareas. The Duke subarea produces 17,000 daily trips that are attracted to the downtown Durham subareas. Conversely, the downtown Durham subarea produces 20,000 daily trips that are attracted to the Duke subarea. Such high volumes

between these subareas are due to the high population density pockets combined with high employment density pockets within each subarea. Major daily trip attractors within these subareas include Duke, Duke Medical Center, Durham VA Medical Center, downtown Durham, NCCU, and DTCC.

Subarea is an area, smaller than the full D-O Corridor, containing key activity centers. The D-O Corridor is comprised of five subareas as shown on **Figure 1.3-4**.

Travel in both directions is expected to contribute significantly to a fixed-guideway transit project's ridership. A substantial portion of travel within the D-O Corridor is trips to and from the three major universities and the large community college. Students, faculty, staff, and visitors use transit, given the walkable nature of college campuses, the cost of parking, and the use of prepaid transit passes. Additional details can be found in DEIS section 3.7.

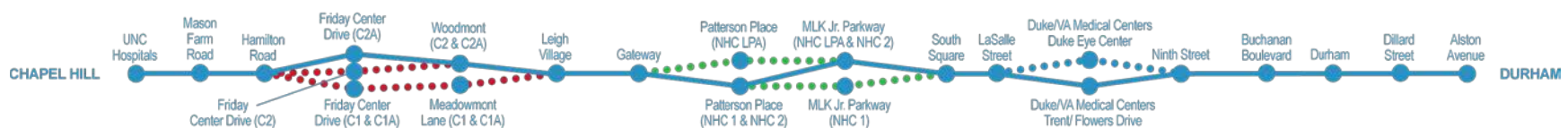


Figure 1.3-1: Existing Roadway Network

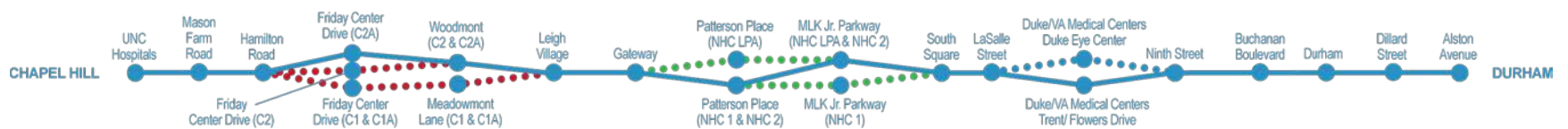
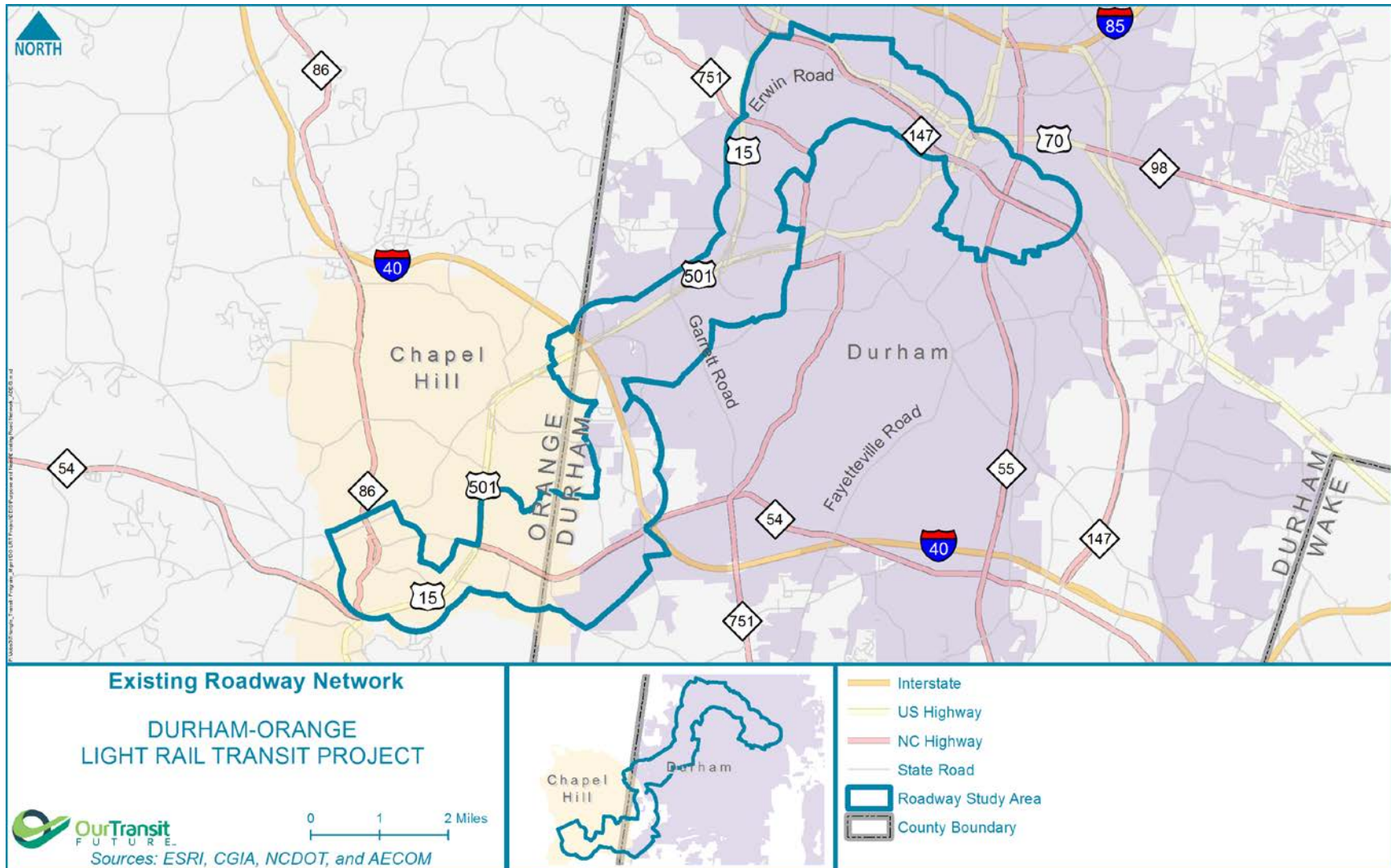
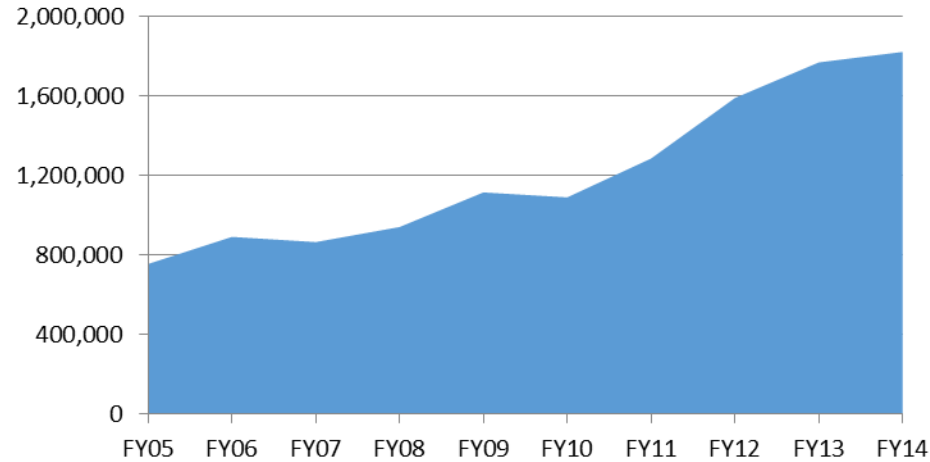


Figure 1.3-2: Growth in Triangle Transit Bus Ridership, 2005-2014

Triangle Transit Annual Bus Ridership



Source: Triangle Transit 2015.

Table 1.3-1: On-Time Performance for Select Triangle Transit Routes

	Route	Primary Roadway used in D-O Corridor	Percent of Trips that are Late ^a
Weekday	RSX	US 15-501	N/A
	400	US 15-501, Erwin Road, and NC 147	26%
	405	US 1501, Erwin Road, and NC 147	15%
	CRX	I-40, NC 54	24%
	800	NC 54	12%
	805	NC 54	16%
Saturday	800	NC 54	19%
	400	US 15-501, Erwin Road, and NC 147	30%
System average			12%

Source: Triangle Transit 2013.

^a Late being defined as greater than 5 minutes off the scheduled time at end-of-line time point.

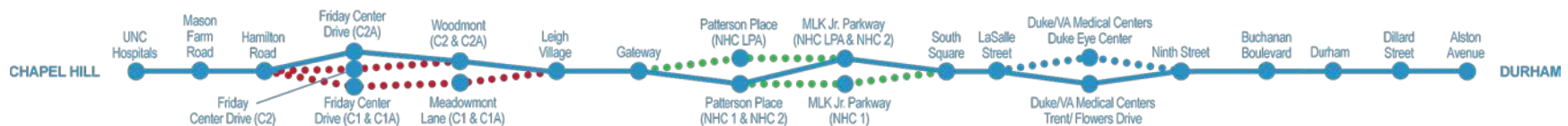
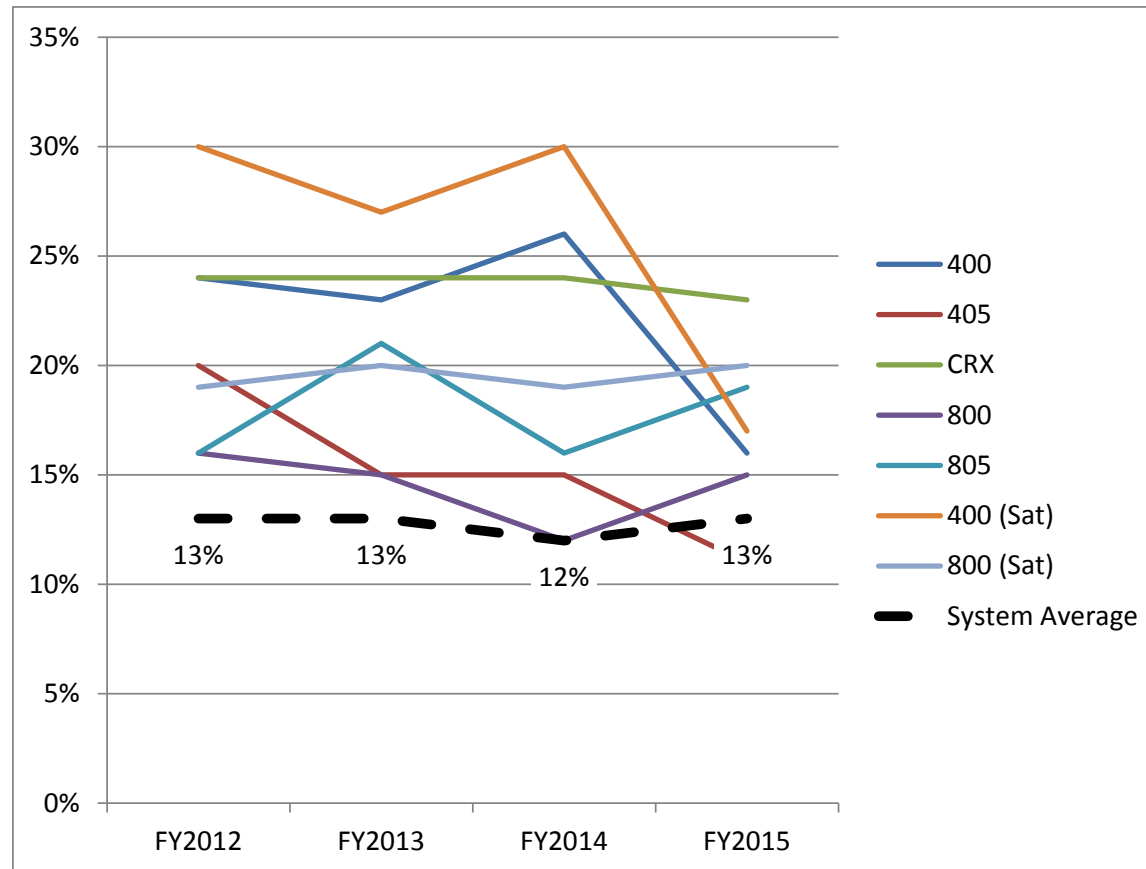


Figure 1.3-3: GoTriangle Corridor Routes – Percentage of Trips that are Late (2011-2015)



Note:

1. To improve on-time performance on Route 800 outbound from Chapel Hill during the afternoon rush hour, between 4:30 and 5:30 pm Route 800 buses were rerouted off NC 54 onto Barbee Chapel Road, Stagecoach Road and NC-751 to get to Renaissance Parkway. This service change took effect in 2013.
2. To improve on-time performance on Route 400, service to the New Hope Commons shopping center was eliminated in August 2014. New Hope Commons can still be accessed via a transfer to a GoDurham route at Patterson Place.
3. To improve on-time performance on Route CRX, schedule adjustments were made in August 2014 to allow additional time for buses to complete their route.
4. Schedule changes were made to Routes 400 and 405 in 2012 to improve on-time performance.

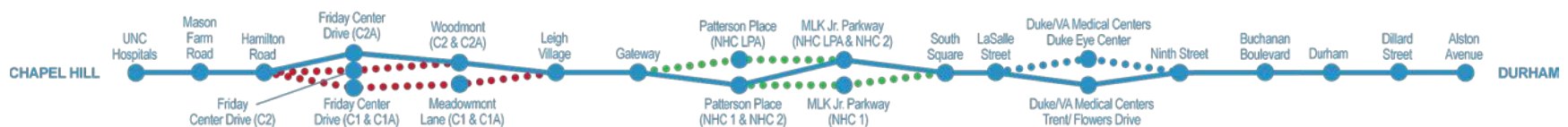
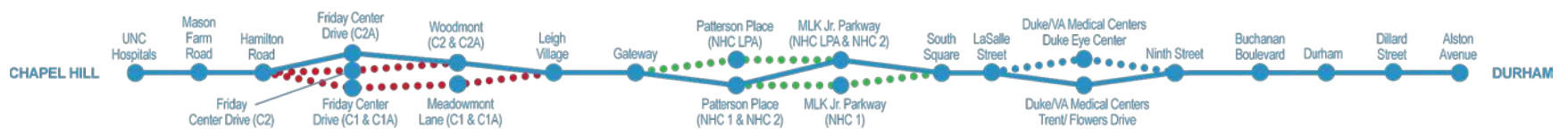
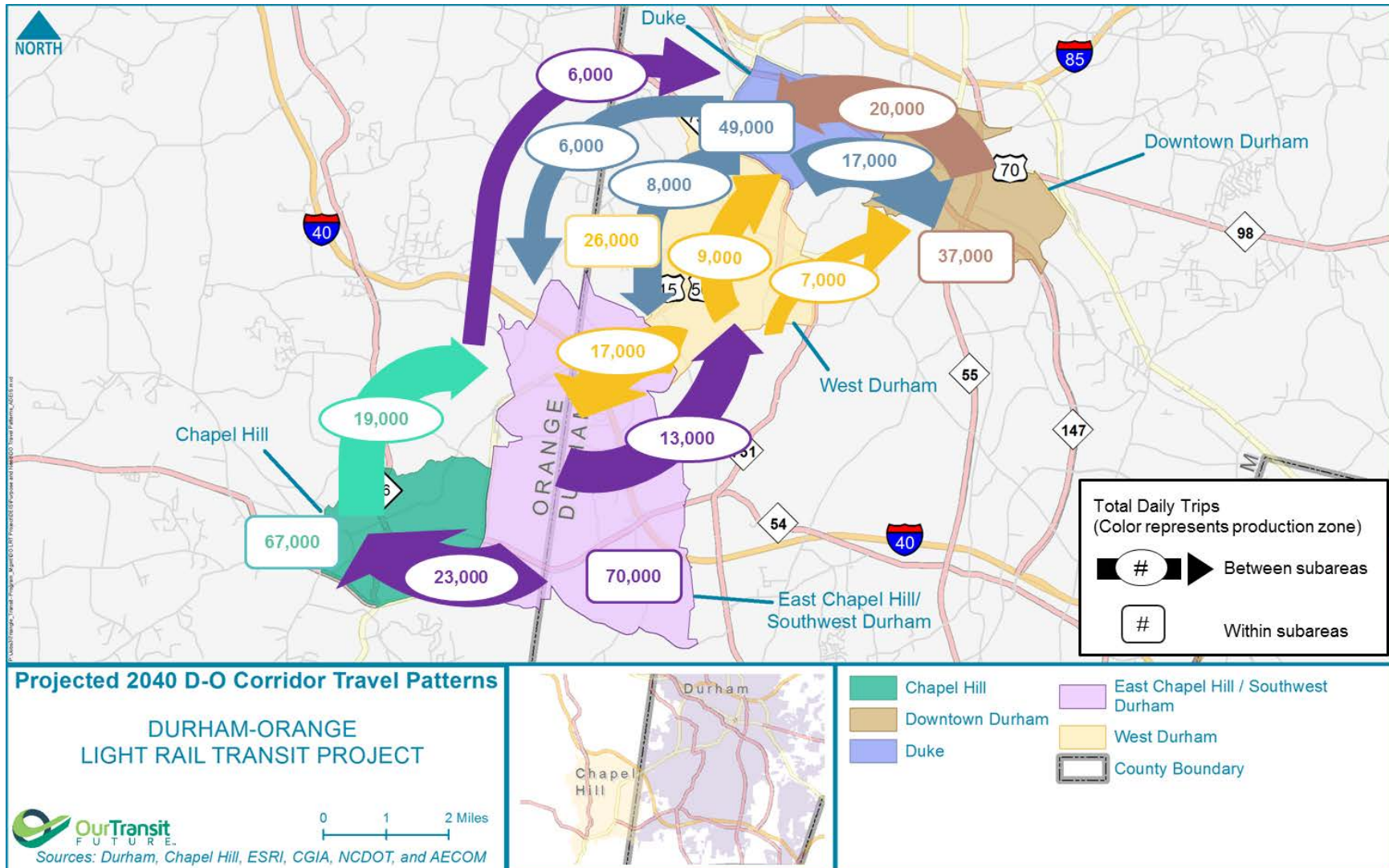
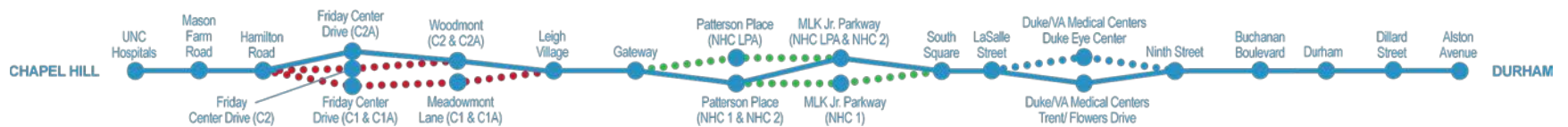


Figure 1.3-4: Projected 2040 D-O Corridor Travel Patterns



1.4 Purpose of the Project

The purpose of the proposed project is to provide a high-capacity transit service within the D-O Corridor, between Chapel Hill and Durham, along the NC 54, I-40, US 15-501, Erwin Road, and NC 147 transportation corridors, that improves mobility, increases connectivity through expanding transit options, and supports future development plans.



1.5 Need for the Project

As described in DEIS section 1.1.2, in order to address the transportation challenge faced by the region and more specifically within the D-O Corridor, and to cultivate a more sustainable cycle of growth for our future, a high-capacity transportation infrastructure solution is required. This transportation solution must address the needs of the D-O Corridor: enhancing mobility, increasing connectivity through expanding transit options, serving major activity and employment centers, and increasing transit operating efficiency. This solution must also support local land use plans that call for compact development to manage and channel future growth along the transportation corridors that can sustainably support the growth, promote economic development, and preserve the region’s high quality of life.

As demonstrated in DEIS section 1.2, the current transportation demands are not being met due to conditions in the D-O Corridor and limitations of the existing transportation networks. Each of these transportation needs and its related challenges represents an opportunity for a transit investment that can enhance mobility, capture new and serve existing riders, and support desired development patterns for the future.

Project Needs

Improve Mobility

- **Enhance mobility** – provide a competitive, reliable alternative to auto use that supports compact development
- **Increase transit operating efficiency** – offer a competitive, reliable transportation solution that will reduce travel time

Increase Connectivity

- **Expand transit options between Durham and Chapel Hill** – enhance and seamlessly connect with the existing transit system
- **Serve major activity and employment centers between Durham and Chapel Hill** – serve the UNC Campus Area, east Chapel Hill, Leigh Village, US 15-501 Corridor, Duke West Campus, Duke and VA Medical Centers, Old West Durham, Duke East Campus, downtown Durham, and east Durham

Promote Future Development

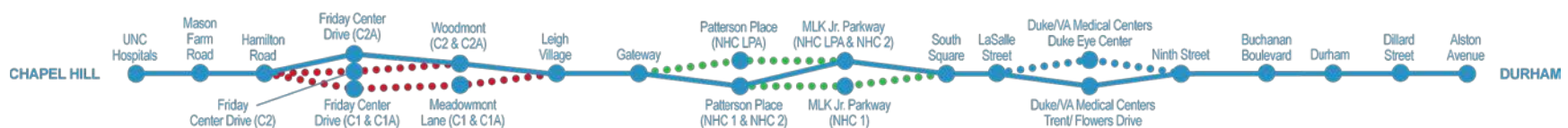
- **Support local land use plans that foster compact development** – support compact development, manage future growth, and maximize the potential for economic development near activity centers

1.5.1 Need to Improve Mobility within the D-O Corridor

The D-O Corridor has over 150,000 employees and students (**Figure 1.5-1**). By 2040, employment is expected to increase by 63 percent and the corridor is projected to add 304,000 additional daily trips, many of which will be made on local roadways (Duke 2015; UNC 2014, 2015; NCCU 2015; DTCC 2011).

The population and employment growth anticipated within the D-O Corridor will translate into increased travel demand.

According to the 2040 MTP, in terms of vehicle miles traveled, growth in travel demand is outpacing population growth. The additional trips resulting from the growth will increase congestion throughout the day, but especially during the busiest morning (a.m.) and evening (p.m.) travel periods. The 2040 MTP also describes the need to address all-day, bidirectional travel for such purposes as school, business, shopping, social

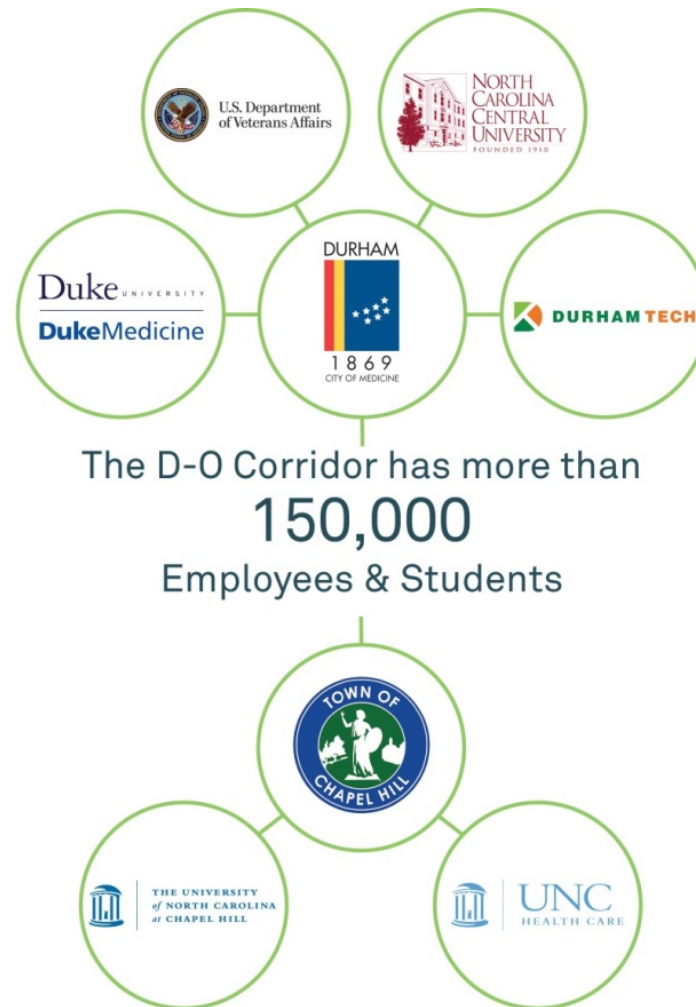


engagements, and medical-related travel, which constitute increasing shares of travel. Therefore, alternatives to the automobile are needed to address the limited capacity of the corridor's roadway system and to accommodate increased travel demand. This section describes the challenges posed by the existing and planned transportation networks to accommodate this growth and to meet the mobility needs within the corridor.

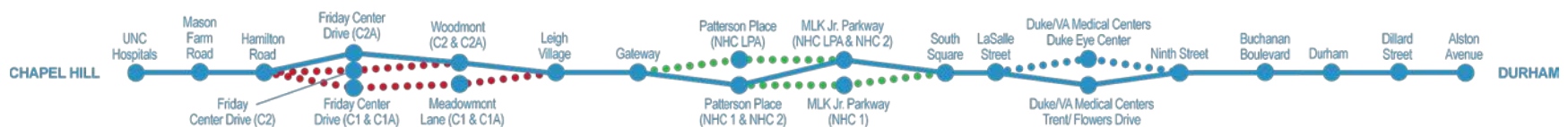
1.5.1.1 Roadway System Lacks Capacity to Accommodate Increased Travel Demand

Due to continued increase in travel demand and the limited ability to increase roadway capacity, the 2040 MTP projects that congestion will worsen through 2040. Even with implementation of all roadway projects programmed in the 2040 MTP, the capacity of the roadway system will not keep pace with the increase in traffic volumes. Coupled with the developed nature of the D-O Corridor and existing congestion, the added travel demand will intensify pressure on the increasingly burdened roadway infrastructure.

Figure 1.5-1: Example Employers and Educational Facilities in the D-O Corridor



The D-O Corridor has more than
150,000
 Employees & Students

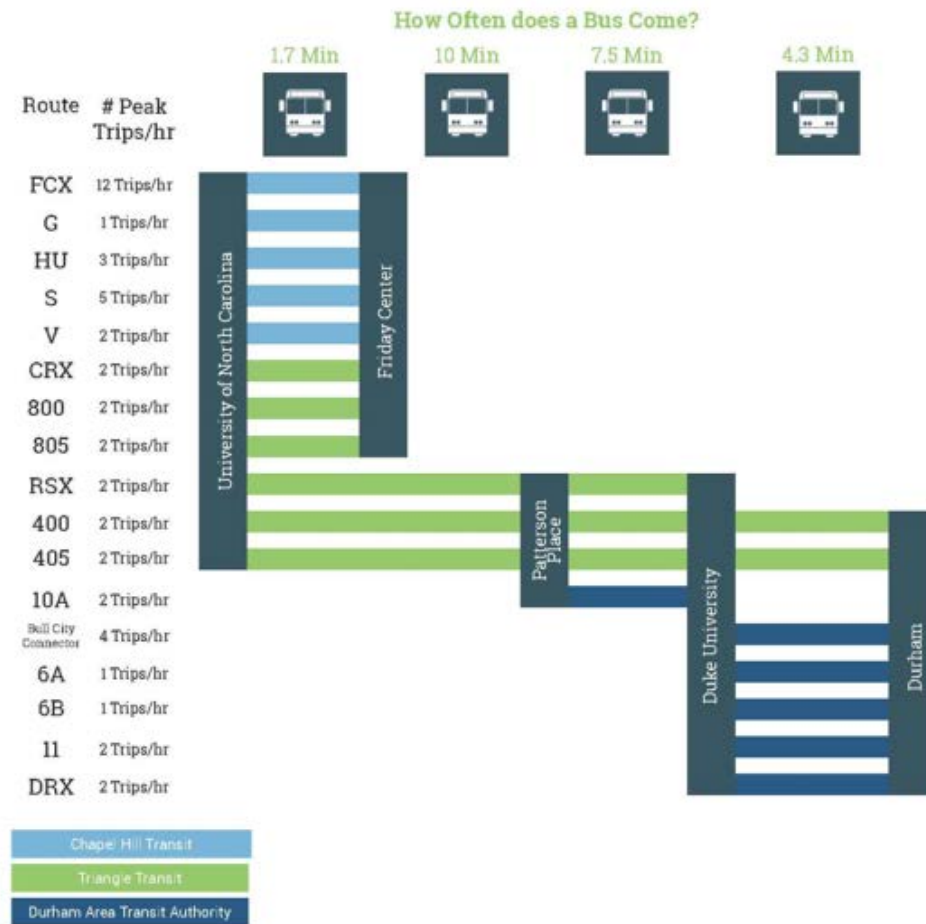


1.5.1.2 Growing Traffic Congestion in the D-O Corridor Limits Mobility

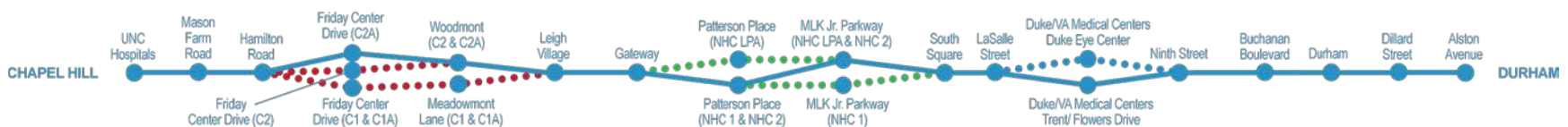
A combination of bus routes serve the D-O Corridor and provide a high level of transit service (**Figure 1.5-2**). However, there are portions of the corridor within Chapel Hill and between Duke and downtown Durham where, due to congestion, adding additional buses will not improve service, as discussed further in DEIS section 3.2. As described in DEIS section 1.5.1.1, the congested roadway network constrains the ability to move quickly throughout the D-O Corridor by private auto. The congested roadways also limit mobility by transit as the current transit system consists solely of buses running in the same lanes as other traffic (called “mixed traffic”). In an attempt to accommodate the growing transit demand, local transit providers offer a variety of transit services within the corridor, including express, limited stop, and local bus service.

Transit is attractive because of its ability to transport the rider to their destination when they expect to arrive. This type of reliability is measured by on-time performance and schedule adherence. Congestion causes difficulty in maintaining reliable schedules within the corridor. On-time performance is equal to or worse than the system average for every weekday regional route in the D-O Corridor and overall travel times are longer

Figure 1.5-2: Existing Bus Service in Corridor



*The “combined headways,” described as being between 1.7 and 10 minutes, refer only to bus routes that operate substantially or entirely within the D-O Corridor.



for transit passengers (see DEIS section 1.3.2).

1.5.1.3 Ability to Mitigate the Negative Effects of Congestion on Existing Bus Service

Despite the abundance and frequency of existing and planned bus service within the D-O Corridor, the growing roadway congestion is adversely impacting this service. As described in DEIS section 1.5.1.1, there is limited ability to increase roadway capacity within the D-O Corridor to alleviate roadway congestion. For these reasons, a high-capacity transportation solution is needed that is not subject to congested roadways and that will still serve the development and activity centers within the D-O Corridor.

1.5.1.4 Existing Bus Transit Cannot Efficiently Serve Growing Ridership Demand

The on-time performance of the existing bus system is impaired by the congestion on the current roadway network (see **Table 1.3-1** and **Figure 1.3-3**). To accommodate the mobility needs of a growing population, a more efficient, time-competitive and reliable transportation mode is needed to reduce overall travel time.

Growing transit ridership in the D-O Corridor strains the existing transit system. As explained in DEIS sections 1.5.1.2 and 1.5.2.5, adding buses in order to accommodate the increased passenger loads will not efficiently serve the growing demand due to excessive roadway congestion. Any additional buses would be subject to the same congestion and on-time performance issues as the existing system.



Chapel Hill Transit hybrid bus

Using a higher capacity vehicle provides the ability to carry more passengers without the need to add an additional vehicle. Since high-capacity vehicles can be connected or “coupled” together, fewer total operators are needed to provide the same level of transit service to meet the demands of the ridership. Using fewer vehicles and operators, a high-capacity transit solution would have lower total overall operations and maintenance costs and would be a more cost-effective means of serving the projected demand.

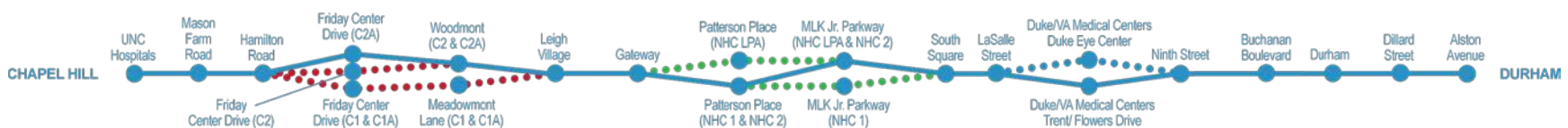
1.5.2 Need to Increase Connectivity

In addition to the need to expand transportation options for transit-dependent populations, DEIS section 1.2 describes a growing need in the corridor to serve populations likely to use transit, such as university students and employees, people who are accustomed to using transit and others who prefer not to drive. Providing service to these large and growing populations will enhance both mobility and economic opportunities for all transit users through improved access to major activity centers and employment within the D-O Corridor.

Transit-dependent populations are people who rely on transit as their primary mode of transportation. Typical demographic groups include persons who do not own or have access to at least one vehicle, youth, seniors, and persons living below the poverty level.

1.5.2.1 Large and Growing Universities/College Student Populations and Growing Employee Travel Markets

Three universities (UNC, Duke, and NCCU) and one community college (DTCC) are within the D-O Corridor. In the Triangle region as a whole, university-related transit



trips comprised nearly 60 percent of total transit trips in 2008. The density of trips associated with students and employees of these institutions, combined with the policies that limit parking on these campuses, represent an opportunity to serve a growing travel market with a major transit investment.

In addition, universities, colleges, and major employers in the Triangle offer prepaid transit fares. Prepaid transit fares occur in one of two ways: fare-free or GoPass as described in detail in DEIS section 3.1.

1.5.2.2 Expanding Transportation Options for Transit Dependent Populations

A significant proportion of the D-O Corridor contains concentrations of transit-dependent persons equal to or slightly greater than in Durham and Orange counties as a whole. In Durham, the highest concentrations of transit-dependent persons are located primarily around downtown Durham, along the NC 55 corridor, in south Carrboro, and in northern Chapel Hill (near the I-40 corridor). In Orange County, the areas with high concentrations of transit-dependent persons include the area surrounding Duke, Duke Medical Center, the Durham VA Medical Center, and the areas south of NCCU, north of I-85 between US 501 and US 501 Business, and north of NC 98 and west of US 70.

While many areas with high concentrations of transit-dependent populations within the D-O Corridor are well-served by the existing bus service, including parts of Chapel Hill and downtown Durham, there are still areas with high concentrations of transit-dependent populations without adequate access to transportation options. Limited transportation options hamper their mobility, reduce their ability to pursue educational and employment opportunities easily, and curb access to social and medical services that are located in other parts of the corridor.

By providing a high-capacity transportation solution that serves the majority of activity centers and destinations, Triangle Transit could restructure existing bus service to better serve transit-dependent communities and further expand transportation options. In addition, improved pedestrian, bicycle, and transit infrastructure in and around transit stations would provide the ability to complete a transit trip without needing a private vehicle. Expanding transportation options will enhance mobility and increase access to education and healthcare for transit-dependent populations.

1.5.2.3 Serve Major Activity Centers Within and Between Chapel Hill and Durham

The D-O Corridor supports the travel of residents, visitors, and employees to major

activity and employment centers within the corridor (**Figure 1.1-1**). These key activity centers generate a large number of trips each day.

Population and employment projections for 2040 predict that these key activity centers will continue to generate a high number of trips. As shown on **Figure 1.5-3**, which illustrates the predicted number of trips per square mile, the highest number of trips is predicted to occur in the areas of UNC, UNC Hospitals, Leigh Village, Patterson Place, South Square, Duke University, Duke University Medical Center, Ninth Street, downtown Durham, and Alston Avenue.

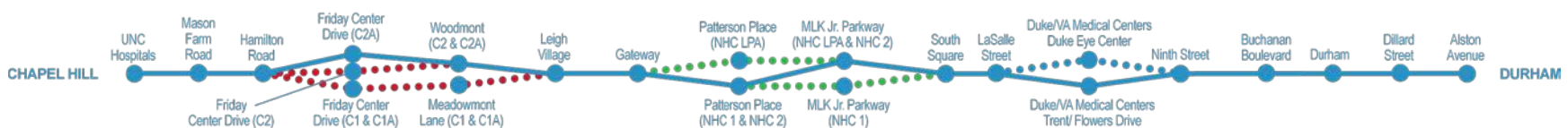
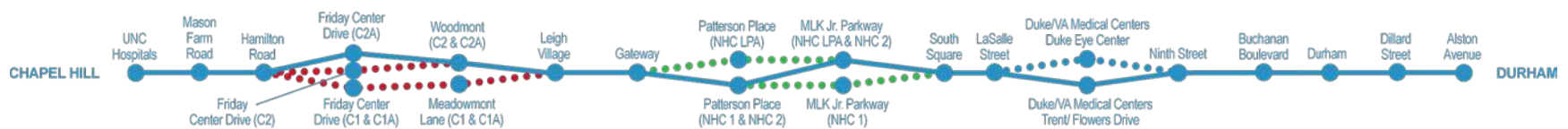
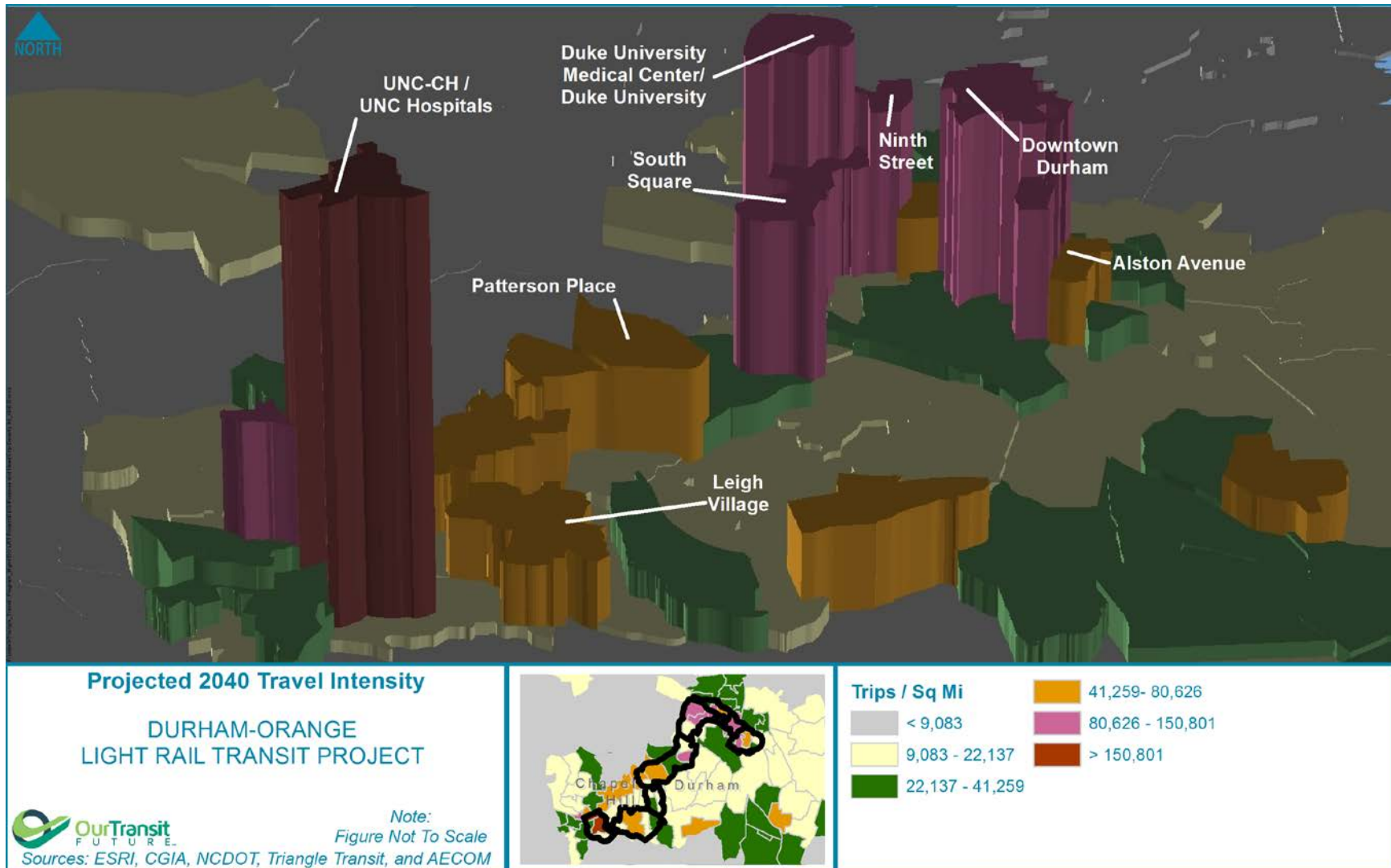


Figure 1.5-3: Projected 2040 Travel Intensity (3D) - Trips Per Square Mile



1.5.2.4 Existing Bus Transit to Multiple Major Activity Centers

Unlike many other areas, the D-O Corridor consists of multiple centers of activity—predominantly UNC, UNC Hospitals, Duke, Durham VA and Duke Medical Centers, and downtown Durham, as well as small centers in between—that generate trips outside typical commute times. Most of these smaller centers within the D-O Corridor generate more trips than the rest of Orange and Durham counties. As a result, unlike other transit markets where most trips flow between residential areas and central business districts, Triangle Transit anticipates that the D-O Corridor would have a more balanced flow of trips traveling in each direction and throughout the day.

1.5.2.5 Existing Bus Transit Cannot Effectively Serve the Major Activity Centers Using Existing Roadway Networks

Currently, buses operate in mixed traffic conditions, and trip times are slower within the D-O Corridor compared to the rest of the transit system (DCHC MPO 2014). Fast, reliable connections to the major activity centers within the D-O Corridor are inadequate. Unlike other transit systems that follow more of a hub-and-spoke system, where many trips converge on a common

destination, trips within the D-O Corridor flow between multiple major activity centers. Providing additional bus service to transit hubs will not solve the need to serve the internal trips between the major activity centers. But due to existing highway congestion, bus service alone cannot serve the needs of these trips.

1.5.3 Need to Promote Future Development

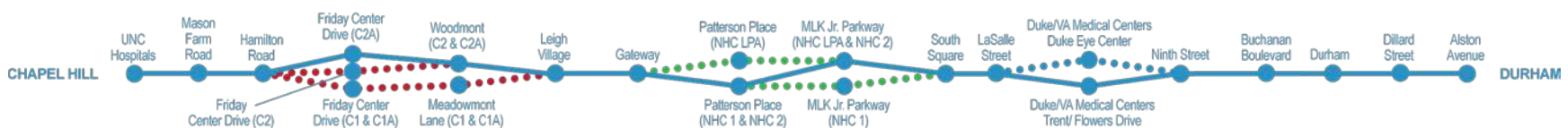
Local governments recognize the need to manage growth and focus development within the D-O Corridor. Chapel Hill, Orange County, and Durham City/County have developed plans and implementation strategies that call for more compact, walkable, higher-density, mixed-use development within the D-O Corridor (see DEIS section 4.1). These plans were developed, in part, because of the capacity and expansion challenges facing the existing roadway network and the desire of the local communities to create more centralized residential and business districts. However, the existing transportation infrastructure does not fully support these land use plans and implementation strategies. Alternatively, a high-capacity transit investment will encourage and channel future growth by providing a transportation option that supports compact, high-density developments. This will help local communities realize their goals and

objectives for future growth and development.

1.5.3.1 Existing Transit Infrastructure Does Not Support Long-Term Economic Development

The D-O Corridor contains several of the Triangle region’s major employment engines. Communities within the D-O Corridor are focused on enhancing economic opportunities for existing businesses and continuing to attract new businesses. A high-quality, fixed-guideway transit investment can be a catalyst for targeted economic development in existing and proposed station areas, enhancing the economic health and vitality of communities.

UNC and Duke have also strengthened their direct connections, which drives the need for improved access between the campuses and their affiliated medical centers. The Robertson Scholars bus, which links Duke and UNC, was introduced in order to facilitate cooperation between the two universities and encourage students, faculty, and staff to take advantage of the educational, cultural, and social offerings on both campuses. Similar to other fixed-route bus services in the D-O Corridor, this bus operates in mixed traffic and is subject to prevailing roadway conditions. A fixed-guideway transit investment will build on this new service and provide a more viable



transit alternative that links these two major institutions closer together.

1.5.3.2 Existing Transit Infrastructure Does Not Support Preservation of Environmental Resources

Orange County is the headwaters for a number of rivers and streams in the Piedmont region. Water resources in Orange County flow into the Cape Fear, Neuse, and Roanoke River basins. Durham County lies on a ridgeline that separates the Cape Fear River Basin and the Neuse River Basin. When development began to sprawl outward in the late 1990s, development regulations in Durham were revised to better address environmentally significant features. More stringent measures were imposed in the 2000s through new Unified Development Ordinances from the city and county.

In Durham and Orange counties, several rivers have been dammed and several streams drain into drinking water reservoirs for the surrounding cities and towns. Ten of the fifteen watersheds in Orange County serve as water supply watersheds and, as such, Orange County was the first county in North Carolina to adopt watershed protection zoning. Adding a high capacity transit system will allow for a denser and less sprawling development pattern in areas slated for development and protect areas that are not.

On April 30, 2004, the US Environmental Protection Agency (EPA) designated the Triangle area as “nonattainment” according to the 1997 8-hour ozone National Ambient Air Quality Standards (NAAQS). On June 7, 2007, the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Air Quality submitted the *Redesignation Demonstration and Maintenance Plan for the Raleigh-Durham-Chapel Hill, North Carolina 8-Hour Ozone Nonattainment Area* (NCDENR 2007). Based on this plan, EPA redesignated the Triangle to “attainment/maintenance” on December 26, 2007. The Triangle area continues to comply with the 1997 standard and air quality pollutants have continued to decrease. As a result of this continued improvement in air quality, on May 21, 2012, the EPA designated the area as “attainment” due to meeting the more stringent 2008 8-hour ozone NAAQS. The Triangle area is also in attainment for all other air quality criteria pollutants. Adding a high-capacity transit investment in the heavily congested D-O Corridor will help the region maintain this attainment status. Air quality is discussed in detail in DEIS section 4.9.

