

Comprehensive Transportation Plan (CTP)

Durham-Chapel Hill-Carrboro MPO

Minimum Problem Statements -- Highway

Note -- The order of listing is: Interstates, US highways, NC routes and then other roadways. Each section is in alphabetical order.

I-85 (US 70 to Granville County)

I-85 from US 70 to the Durham and Granville county boundary is mostly a four-lane freeway but is six lanes in the section closest to US 70. In terms of regional trips, this interstate connects Durham to several small North Carolina cities and towns in the northeast, and is one of the few major roadways that connects Durham to the north and east because of the barrier that Falls Lake imposes. In terms of interstate trips, I-85 is the principal roadway connecting Atlanta (Georgia), Charlotte, the North Carolina piedmont cities, Richmond (Virginia) and Washington (DC). The CTP includes the addition of travel lanes to create a six-lane freeway and upgraded interchanges and ramps. As a practical matter, the lane additions and upgrades should be extended across the Falls Lake bridge to the I-85/US 15 interchange because there is a significant number of commuter trips to large employers in Butner, the prisons and state hospital, and to Creedmoor residences. The CTP has a new four-lane divided roadway, the Northern Durham Parkway, which will intersect I-85 at the current Glenn School Road (SR 1675) interchange.

The 2013 Annual Average Daily Traffic (AADT) ranges from 43,000 vehicles per day (vpd) to 52,000 vpd on a roadway with a 60,000 vpd Level of Service (LOS) D capacity. The 2040 volumes are projected to range from 65,000 vpd to 70,000 vpd. This increase will yield volume-to-capacity ratios that approach 1.2 and cause travel delays, and possible crash frequency and severity increases on this important interstate corridor.

Currently, there are not any major interchanges on this segment and as a result there are not any extraordinary intersection delays or safety problems based on the 2014 DCHC MPO Mobility Report Card. Red Mill Road (SR 1632) and US 15 are the highest volume intersecting roads and their 2013 AADT is 9,600 vpd and 8,100 vpd, respectively. And, Glenn School Road is the only interchange that has a significant retail presence. However, the volume on the intersecting roads is expected to increase significantly given the expected residential and employment growth in this portion of the region. The CTP deficiency analysis shows that the Glenn School Road/I-85 and Red Mill Road/I-85 interchanges have functionally obsolete bridges, and the East Club Boulevard (SR 1671)/I-85 interchange bridge is both structurally and functionally obsolete. The Red Mill Road/I-85 interchange meets at least one of the intersection crash warrants, and should be further investigated. These interchanges and ramps will need to be upgraded. The 2040 projected volumes for Red Mill Road, East Club Boulevard and the Northern Durham Parkway (new facility) will approach 17,000 vpd, further straining the obsolete design of these facilities.

The DCHC MPO, Capital Area MPO and NCDOT began the Triangle Tolling Study in late 2016 and will complete the study by 2018. I-85 will be part of the tolling study to ascertain whether or not managed lanes are feasible and logical for I-85.

Residential and employment development will continue to occur around the I-85 interchanges. Bicycle, pedestrian and transit trips will need to be considered in the interchange upgrades and the cross-section of the intersecting roadways.

The US Army Corps of Engineers and resource agencies should be included in the environmental analysis stage of project development very early. I-85 crosses Falls Lake and its related wetlands, Army Corps of Engineering property, and critical watershed. The entire length of this study segment is within a protected or critical watershed.

I-85 (I-40 to Durham County line)

Traffic volume on segments of I-85 from I-40 to the Durham County line is currently between 33,000 vpd and 37,000vpd. It is projected to exceed LOS D by 2040 with expected volumes of 49,800 vehicles per day (vpd), 51,600 vpd, and 52,700 vpd from I-40 to South Churton Street (SR 1009), South Churton Street to NC 86, and NC 86 to US 70, respectively. LOS D capacities on the facility range from 29,700 vpd to 44,500 vpd. Improvements are needed in order to relieve anticipated congestion and to maintain a minimum LOS D on the existing facility. This section of I-85 is currently a four-lane divided freeway with three interchanges and corresponding ramps within an approximate 260-foot right-of-way. This section of I-85 is adjacent to the improved six-lane section of I-85 through Durham County.

The CTP project proposal is to improve to a six-lane freeway with a raised median for this facility to better accommodate the projected 2040 volume.

I-85/US 70 Connector (SR 1239)

Peak-period traffic flow on Efland-Cedar Grove Road (SR 1372) from US 70 to Forest Avenue (SR 1322), from Forest Avenue to Mount Willing Road (SR 1120), and from Mount Willing Road to I-85/I-40 currently exceeds the realistic design capacity and service flow rate on the subject facilities. These facilities collectively serve as the only option for many commuters with origins in northern Orange County to access I-85/I-40 in the northbound/eastbound (respectively) direction to further access the region's major employment centers to the south and east. This particular route involves taking two (2), 90-degree turns and traversing an at-grade railroad crossing located approximately 30 feet from two (2) intersections on either side. The combination of facilities creates a major capacity contraction relative to the facilities that feed it traffic. Additionally, stacking at the intersections connecting the combination of facilities creates hazardous conditions for vehicles encountering the at-grade railroad crossing adjacent to the intersections.

The CTP proposal is to convert the existing I-85/US 70 Connector's interchange with US 70 approximately 1.25 miles east to a full-movement interchange with ramps providing access from all directions or to convert the interchange to a full-movement T-shaped at-grade intersection. Currently, ramps only provide access from northbound on the Connector to eastbound US 70 and from westbound US 70 to southbound on the Connector. There is no access from westbound US 70 to the Connector or from the Connector to US 70 westbound. The project would allow an improved mobility alternative for

commuters using Efland-Cedar Grove Road to access I-40/I-85 and avoidance of a major capacity contraction and safety hazard using a combination of local streets approximately 1.25 miles west. Any change to the interchange would consider the accommodation of bicycle travel along US 70.

US 501 (North Roxboro Road) (North Duke Street (US 501) to Sandlewood Drive (SR 1698)

US 501 (North Roxboro Road) needs additional capacity between the US 501 (North Duke Street)/ US 501 Business (North Roxboro Street) split and Sandlewood Drive (SR 1698) due to projected future congestion and to improve mobility. A 6-lane divided roadway is proposed for the current 5-lane section from North Duke Street to Milton Road (SR 1456). A median should be added from Milton Road to Sandlewood Drive. Providing a divided roadway in this segment will improve mobility and effectively creates a divided cross-section from I-85 to Person County in the north.

North Roxboro Road is the major thoroughfare that connects I-85 and central Durham with northern Durham County and the city of Roxboro. It is the most important commuter route in northern Durham County and currently experiences significant traffic delays at intersections such as Latta Road/Infinity Road. Retail, commercial, schools, libraries and other service locations for northern Durham residents are clustered along this thoroughfare. It is in the North Carolina truck network and in some cases twin and 53-foot trucks are permitted. Most of the area in the vicinity of this roadway segment is within the water and sewer service area of the city of Durham and expected to experience moderate residential growth in the future.

The current LOS D capacity is 36,600 vehicles per day (vpd), and daily traffic counts range from 32,000 vpd near the Eno River to 21,000 vpd near Sandlewood Drive. There has been no measureable increase in daily traffic counts from 2003 through 2013. However, 2040 traffic forecasts have daily volumes increasing to as high as 48,000 vpd, which would result in volumes that are 30% over capacity, i.e., volume-to-capacity ratio (v/c) of 1.3. Capacity increases on North Duke Street and the extension of North Alston Avenue to North Roxboro Street/Old Oxford Road (SR 1004) would likely attract more trips to this segment of North Roxboro Road.

It should be noted that the Omega Road intersection is a potentially hazardous intersection as indicated in the 2014 NC Highway Safety Improvement Program (HSIP) report, i.e., it exceeds the warrant for frontal impact crashes. In addition, the Eno River bridge is functionally obsolete, which means that it was not constructed to the standards that are currently used.

Although this project was not funded in the FY 2016-2025 Transportation Improvement Program (TIP), it did receive a moderate score in the NCDOT prioritization process (SPOT P3.0) and therefore might score well enough in the next prioritization cycle to be funded in the TIP. A funded project, TIP# U-5516, is to provide intersection improvements to the Latta Road/Infinity Road intersection with US 501, which is just north of Omega Road.

US 501 (North Duke Street) (I-85 to US 501 Business (North Roxboro Street))

US 501 (North Duke Street), from I-85 to US 501 Business (North Roxboro Street), is currently a five-lane roadway with sidewalks on both sides of the segment from I-85 to Murray Avenue. This US highway is the principal road between north Durham and I-85 and central Durham. US 501 merges with US 501 Business (North Roxboro Road) in northern Durham to continue north to the city of Roxboro (approximately 28 miles). The CTP includes the creation of a four-lane, divided synchronized street cross-section with turn lanes at major intersections and commercial driveways. A six-lane divided roadway would likely require impacts to many structures.

It is expected that US 501 will attract the majority of new trips as northern Durham County grows because the CTP does not recommend significant improvements on parallel routes. NC 157 (Guess Road) does not have any improvements and possible capacity improvements on North Roxboro Street might be limited to the addition of a narrow median because of the proximity of residential and commercial buildings to the current roadway. Guess Road has similar limitations. Thus, capacity improvements for this corridor are likely to be less costly and complex on North Duke Street given a relatively lower density of residential and commercial development.

The current volume exceeds the capacity. On US 501, the 2013 AADT ranges from 29,000 to 34,000 vehicles per day (vpd) on a roadway with a 26,800 vpd capacity (LOS D). There appears to be excess capacity on one parallel route. Guess Road (1.3 miles to the west) has 23,000 vpd on a roadway with a 44,000 vpd capacity. The current 28,000 vpd on North Roxboro Street (0.8 miles to the east), however, greatly exceeds 22,200 vpd capacity of that roadway. The 2040 volume is projected to range from 40,000 to 50,000 vpd. This will yield volume-to-capacity ratios from 1.4 to 1.7, an indication of heavy travel delays on this important corridor. The 2040 volume on North Roxboro Street will push that roadway to a highly congested 1.9 volume-to-capacity ratio, but Guess Road will continue to operate at a volume that is below capacity.

There are not any major roads that intersect US 501 along this segment and as a result there are not any extraordinary intersection delays or safety problems. The intersections on this corridor have a level-of-service of C or better (i.e., A or B) based on the 2014 DCHC MPO Mobility Report Card.

Residential development along this segment and the retail and office development on the northern section generate bicycle, pedestrian and transit trips. The CTP recommends bike lanes for the complete extent of this road segment and consideration of sheltered transit stops and bus pull-outs in the design. Transportation Improvement Program (TIP) project EB-5715 is a sidewalk on the east side of US 501 from Murray Avenue to North Roxboro Road that is planned for construction in 2017.

US 501 crosses Ellerbee Creek immediately south of the US 501/Stadium Drive intersection but there are not any associated wetlands or floodplains. The entire length of this study segment is within a protected watershed.

US 70 (I-85/US 70 Connector to US 70 Alternate)

Traffic volume on segments of US 70 from the I-85/US 70 Connector to US 70 Alternate is projected to exceed LOS D by 2040 with expected volumes of 17,200 vehicles per day (vpd), 19,700 vpd, and 22,200 vpd from the I-85/US 70 Connector to West Hill Avenue (SR 1161), West Hill Avenue to NC 86 (North Churton Street), and North Churton Street to US 70 Alternate, respectively. LOS D capacities on the facility range from 12,400 vpd to 12,700 vpd. Improvements are needed in order to relieve anticipated congestion and to maintain a LOS D on the facility. This section of US 70 is currently a two-lane, 24-foot undivided cross section with left and right-turn lanes at various intersections and a center two-way left turn lane at various locations along the facility.

The CTP project proposal is to provide a four-lane divided cross section for this facility with five-foot bike lanes and five-foot sidewalks separated from the travel lanes to better accommodate the projected traffic volume.

NC 54 (Old Fayetteville Road (SR 1937) to Bethel Hickory Grove Church Road (SR 1104))

NC 54 from Old Fayetteville Road (SR 1937 and SR 1107) to Bethel Hickory Grove Church Road (SR 1104) starts as a four-lane divided urban boulevard and quickly turns into a rural, two-lane highway as it heads west out of town. This road primarily serves commuters from western Orange County and Alamance County. Traffic volumes on NC 54 from Bethel Hickory Grove Church Road to Old Fayetteville Road currently exceed Level of Service (LOS) D capacity of 12,400 vehicles per day (vpd) with an existing volume of 15,000 vpd. Volume on the facility is forecast to exceed LOS D by 2040 with an expected volume of 24,900 vpd. However, NCDOT counts from the last decade show no increase in AADT just west of the intersection of NC 54 and Old Fayetteville Road.

Improvements are needed in order to relieve existing and anticipated congestion and to maintain a minimum LOS D on the existing facility. This section of NC 54 is currently a two-lane, 24-foot undivided cross section with limited-storage right- and left-turn lanes at its intersection with Neville Road (SR 1945).

The CTP project proposal is to improve the capacity of this roadway but further study is needed before any definitive cross-section or specific improvements are identified. The corridor runs through two watershed protection areas and the roadway is popular among bicyclists. It should be noted that the 2013 Orange County Comprehensive Transportation Plan (CTP) covering the portion of the Triangle Area Rural Planning Organization (TARPO) planning area within Orange County recommends a four-lane divided cross section for this facility from Orange Grove Road (SR 1006) to Neville Road (SR 1945).

NC 751 (NC 54 to Martha's Chapel Road (SR 1752))

NC 751 runs from US 64 in Chatham County to US 70 in Durham County. This particular section of NC 751 is from Martha's Chapel Road (SR 1752) in rural Chatham County, which is next to the DCHC MPO border, to NC 54 in the city of Durham. Most of this section is a two-lane road with turn lanes at cross streets and major driveways. The section adjacent to I-40 and Renaissance Parkway, which runs from

Southpoint Auto Park Boulevard to Renaissance Parkway, has four to five lanes to accommodate the relatively high traffic volume with turn lanes for I-40 and Renaissance Parkway. The roadway drains to nearby Jordan Lake and there are over twenty fresh water ponds in the corridor.

Improvements are needed to accommodate projected traffic in order to maintain a Level of Service D and provide mobility between I-40 and the growing retail, residential and employment development in southern Durham County and eastern Chatham County. Improvements might include adding turn lanes at intersections and widening the current lanes and shoulders at a minimum, or possibly include additional lanes.

It should be noted that a feasibility study (FS-1008B) was started in 2014 for this section of NC 751 that collected field data and produced traffic forecasts. Although the feasibility study was not completed, it can provide details on the need for safety and capacity improvements on this roadway.

This problem statement presents the roadway in four different sections below.

The southern section, from Martha's Chapel Road (SR 1752) to O'Kelly Chapel Road (SR 1731), is a two-lane major collector with turn lanes at some intersections. It mostly has a 60-foot right-of-way but some subsections have 90-foot and even 200-foot right-of-way sections. The area is rural but has occasional churches and small scale commercial development such as nurseries. The 2012 AADT is 8,300 vehicles per day (vpd) and this volume has been about the same since 2003. The capacity is 12,400 vpd at LOS D. Although the current volume is well within capacity, the high peak volume split (75%) and the narrow rural roadway (24 feet overall width) combine to create safety hazards and congestion that is not common on rural highways. The 2040 volume is expected to increase to 14,000, or a 1.1 V/C ratio, which will worsen the safety and congestion problems. It is recommended that this southern section be widened to a four-lane divided boulevard facility.

The middle section, from O'Kelly Chapel Road to Renaissance Parkway, is a two-lane major thoroughfare with turn lanes at intersections. It mostly has a 60-foot right-of-way but some subsections have up to 90-foot, and the overall road width is 19 feet to 24 feet. It should be noted that this section connects to two east-west roads, Stagecoach Road (SR 1107) and O'Kelly Chapel Road, that provide travelers with a southern alternative to congested I-40 and NC 54. The area is a mixture of residential and retail/commercial, and there is ample undeveloped land that is developing at suburban densities. Recent development includes large single-family or multi-family development.

The 2013 AADT ranges from 9,700 vpd at the southern end to 13,000 vpd at the northern end. The capacity is 12,700 vpd at LOS D. Although the current volume is close to capacity, the high peak volume split (65% to 75%), the narrow overall roadway, and multiple driveways and intersections combine to create many safety hazards and congestion. The 2040 volume is expected to be 18,000 vpd to 21,000 vpd, resulting in a 1.4 to 1.8 V/C ratio that will increase delay.

The section adjacent to I-40, from Renaissance Parkway to Southpoint Autopark Boulevard, is a four-lane major thoroughfare south of I-40 and a four-lane divided boulevard north of I-40. It has many right turn slip lanes and double left turn lanes at the I-40 and Renaissance Parkway intersections to accommodate traffic to nearby South Pointe Mall and the adjacent big box and chain retail stores, and growing office developments. Local planners do not anticipate further widening of this roadway section because the roadway in some locations are close to buildings and the area to the west is mostly unbuildable given its proximity to Third Fork Creek and New Hope Creek.

The 2011 AADT ranges from 15,000 vpd north of I-40 to 12,000 vpd south of I-40. The capacity is as high as 36,600 vpd. The 2040 volume is projected to be 30,600 vpd and 18,500 vpd north and south of I-40, respectively. Additional lanes are not recommended for this section in the long-range plan because the 2040 projected volumes do not exceed existing capacities.

The northern section, from Southpoint Autopark Boulevard to NC 54, is mostly a two-lane major thoroughfare with turn and accessory lanes at the driveways for apartment complexes. It has a 60-foot right-of-way and the overall road width is 24 feet. The area is a mixture of multi-family residential and retail such as car dealerships, which has a relatively low trip volume among retail establishments. The road widens to a five-lane facility with a 110-foot right-of-way for about 800 feet south of NC 54 at the Hope Valley Commons shopping center. This roadway section provides an important connection between south Durham and I-40.

The 2013 AADT is 15,000 vpd and has increased from 12,000 vpd in 2003. The capacity is 12,700 vpd at LOS D for the two-lane section and 27,600 for the five-lane section. The DCHC MPO's Mobility Report Card did not discern any extraordinary delays in this alignment. The lack of congestion is probably because there are very few driveways and those that exist have turn and accessory lanes to help traffic flow. The 2040 volume is expected to be 31,000 vpd, resulting in a 2.4 V/C ratio in the two-lane section and considerable delays and safety problems. The NC 54/NC 751 intersection had an LOS C and LOS D rating in 2013 (see DCHC MPO Mobility Report Card) – this service level will continue to deteriorate. It is recommended that this northern section be widened to a four-lane divided boulevard facility where it is two lanes and a median be added where it is a five lane section.

The future residential and commercial development around the section of NC 751 that is north of Fayetteville Road (SR 1118) will generate significant bicycle, pedestrian, and transit traffic. There are currently just a few sections with sidewalks and some bike lanes between Stagecoach Road (SR 1107) and Fayetteville Road. There is no transit service south of Renaissance Parkway. The CTP recommends sidewalks and bike lanes along this section of NC 751, and as well as a multiuse path called Eagle Spur Greenway to connect to the popular American Tobacco Trail.

NC 751 (Hope Valley Road) (Woodcroft Parkway to South Roxboro Street (SR 1146))

NC 751 (Hope Valley Road), from NC 54 to South Roxboro Street (SR 1146), is currently a two-lane undivided major thoroughfare north of Woodcroft Parkway and a four to five-lane major thoroughfare south of Woodcroft Parkway. There are turn lanes at cross streets and major driveways, e.g., apartment complexes. Improvements to a four-lane divided boulevard are needed between Woodcroft Parkway and South Roxboro Street to accommodate projected traffic in order to maintain a LOS D and provide mobility between southwest Durham, I-40 and central Durham. The CTP includes an extension of Woodcroft Parkway from NC 751 to Garrett Road (SR 1116) that is expected to attract trips away from the section of NC 751 between Woodcroft Parkway and Garrett Road.

This section of NC 751 currently has a 60-foot right-of-way, sidewalks covering many locations along the route, and no bicycle lanes. The 2013 AADT is 16,000 vpd to 21,000 vpd north and south, respectively of Woodcroft Parkway. The capacity north of Woodcroft Parkway is 11,600 vpd and thus already

experiences LOS E congestion. Although the capacity south of Woodcroft Parkway, 31,600 vpd, is higher than the current 18,000 vpd, there are many traffic signals, driveways and lane changing that cause delays in this section. The 2040 volume is expected to increase to 22,800 vpd and 25,700 vpd in the north and south sections, respectively, and increase the congestion and delays.

Intersection improvements will be needed, as well. The NC 751/Garrett Road intersection exceeds the NCDOT standard safety warrant for frontal impact crashes (as indicated in the 2014 NC Highway Safety Improvement Program (HSIP) report), and has an LOS D rating in the 2014 Mobility Report Card.

In this vicinity, there are many residential developments, shops, and restaurants, and a high school and two large grocery stores. There are also plans for more neighborhoods to be developed around this area. With the current and future developments around NC 751, there will be a significant percent increase in traffic congestion on this stretch of NC 751, especially during the PM peak time frame when both the nearby high school and working commuters are on the road at the same. Furthermore, the intersection of NC 751 and South Roxboro Street needs to be improved, possibly by making South Roxboro Street to NC 751 (south) a through movement and creating NC 751 (north) as the single leg of a T-intersection into South Roxboro Street. South Roxboro Street is a four-lane divided arterial that will be extended in the future to provide a direct route to downtown Durham.

The current residential and commercial development around NC 751, in addition to the future residential development, will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities, and many of the bus stops do not have any amenities and do not include bus pull-outs resulting in blocked traffic. The need for pedestrian, bicycle, and transit facilities will only increase with additional development along NC 751. In the Durham Comprehensive Bicycle Transportation Plan, bicycle lanes have been proposed along NC 751. The Third Fork Creek Trail intersects with this section of NC 751 and additional bicycle and pedestrian facilities are needed to connect nearby destinations to the trail. The DurhamWalks! Pedestrian Plan recommends sidewalks on both sides of NC 751.

NC 86 (US 70 Bypass (Cornelius Street) to north of the NC 86/NC 57 split)

NC 86, from US 70 Bypass (Cornelius Street) to north of the NC 86/NC 57 split, is currently a two-lane undivided regional facility that is expected to be near capacity by 2040. NC 86 overlaps with NC 57 on this section of roadway. Improvements are needed to accommodate projected traffic in order to maintain a LOS D and to improve pedestrian safety.

This section of NC 86 currently has a 60-foot right-of-way, no sidewalks, and no bicycle lanes. The 2015 AADT is 15,000 vehicles per day (vpd); by 2040, the volume is expected to be over 20,000 vpd compared to an LOS D capacity of 12,900 vpd for the existing cross section. There are many neighborhoods, restaurants, shops, and a couple schools nearby this stretch of NC 86. This route provides an important connection to Roxboro and several towns in the southern Virginia region, which contribute to the high traffic volume on this route. Any further suburbanization of this northern Hillsborough area should also account for a significant percent increase in traffic on NC 86. Improvements at the NC 86/NC 57 intersection are identified as a need in the Safe Routes to School Action Plan for Stanford Middle School. While the intersection was reconfigured more than a decade ago to install a traffic signal, the intersection is still less than desirable with closely intersecting local streets and a right turn short cut

that remains open. Additionally, the acute intersection angle with US 70 Bypass makes certain maneuvers difficult for the significant heavy truck traffic routed through this intersection by the town's designated truck route which prohibits no-local trucks continuing south on NC 86.

The current residential and commercial development around NC 86, in addition to any planned development, will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities and currently no bus service. However there is a Triangle Transit route on NC 86 and the US 70 bypass directly south of this section. The need for pedestrian, bicycle, and transit facilities will only increase with additional development along NC 86 and more through traffic from northern Orange County.

NC 86 (Old NC 10 (SR 1710) to US 70 Business)

NC 86, from Old NC 10 (SR 1710) to the US 70 Business route is currently a two-lane, undivided arterial that is approaching capacity and needs to be expanded to a four lane divided facility. There are two potential project sections: US 70 Business to I-85 and I-85 to NC 10. Improvements are needed to accommodate both current and projected traffic in order to maintain a LOS D. The current LOS D roadway capacity, 12,400 vehicles per day (vpd), struggles to handle the 10,000 vpd (2013 AADT). The 2040 volume forecast of 18,500 vpd and 32,600 vpd on NC 86 north and south of I-85, respectively, will create very high levels of congestion and delay.

This section of NC 86 currently has sidewalks at select locations, but no bicycle lanes. There are many neighborhoods, restaurants, shops, and schools along this stretch of NC 86. This section of NC 86 serves as a major commuting route between Hillsborough and Chapel Hill, and provides access to several park-and-ride lots. Future passenger rail stations are also proposed for this corridor. Additionally, the Old NC 10 corridor is heavily used by both commuting and recreational bikers moving between Durham and Hillsborough. This route appears on both the Hillsborough Connectivity Plan and the Orange County bicycle plan.

The current residential and commercial development around NC 86, in addition to the planned office and residential development, will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities, and many of the bus stops do not have any amenities and do not include bus pull-outs resulting in blocked traffic. The need for pedestrian, bicycle, and transit facilities will only increase with additional development along NC 86 and the construction of passenger rail stations.

Old NC 86/Hillsborough Road (SR 1009) (I-40 to Old Fayetteville Road (SR 1107))

Traffic volume on segments of Old NC 86 (SR 1009) from I-40 to Old Fayetteville Road (SR 1107) is projected to exceed LOS D by 2040 with expected volumes of 15,300 vehicles per day (vpd), 17,900 vpd, and 23,700 vpd from I-40 to Eubanks Road (SR 1727), Eubanks Road to Dairyland Road (SR 1104), and Dairyland Road to Old Fayetteville Road, respectively. LOS D capacities on the facility range from 12,400 vpd to 13,800 vpd. Improvements related to travel lane width, intersection and driveway entrance sight distance, and paved shoulders accommodating bicycle travel are needed to improve safety and to modernize the roadway to accommodate the projected increase in traffic volume and multi-modal use.

The section of Old NC 86 (SR 1009) from I-40 to Dairyland Road is currently a two-lane, 20 to 24-foot undivided cross section with right and left-turn storage at various intersections. The section of Old NC 86 from Dairyland Road to Old Fayetteville Road is currently a two-lane, 20 to 24-foot undivided cross section that widens to a 30 to 40-foot undivided cross section with a center two-way left turn lane transitioning to left-turn storage at two intersections.

Additional vehicle lanes would affect the character of the roadway and likely impact residential and agricultural areas. Bike lanes along the segment between Hillsborough Road and Dairyland Road would improve the corridor, as this segment of roadway sees very heavy bicycle traffic at certain times. The road is narrow and it can be difficult for vehicles to pass bicyclists when there is traffic, and bicycle lanes would alleviate this pressure. There are existing turn lanes at major intersections along the entire corridor, but other safety improvements would also ease congestion in the future.

The CTP designates the roadway as needs improvements. The project proposal is to provide a two-lane undivided cross section comprised of twelve-foot travel lanes and five-foot bike lanes to more safely and efficiently accommodate increasing traffic volume and facilitate bicycle travel.

NC 98 (Holloway Street and Wake Forest Highway) (US 70 to Wake County Line)

NC 98, from US 70 to the Wake County boundary, is currently a four-lane undivided road from US 70 to Nichols Farm Drive and a two-lane section east of the intersection with Nichols Farm Drive. The short section from US 70 to Junction Road is already five lanes and will receive capacity improvements as part of the East End Connector construction that is already in progress. There are two possible project sections: Junction Road to Nichols Farm Drive; and Nichols Farms Drive to the Wake County Line. There are commonly turn lanes at cross streets, center left turn lanes at some retail developments and turn and acceleration lanes at driveways to major subdivisions. Sidewalks and bike lanes are rare and mostly concentrated in the segment near US 70. NC 98 is the principal road between Durham and northern Wake County (including Wake Forest) because Falls Lake limits the number of roadways that can make this east-west connection. It is the only major east-west roadway between I-85 and I-540, which is ten miles or more, and these rural areas are likely to experience substantial residential growth over the next few decades. The CTP includes the addition of a narrow median in the current four-lane section and the addition of two travel lanes in the current two-lane section to create a four-lane divided boulevard throughout.

The 2011 AADT for the four-lane segment of NC 98 ranges from 16,000 vpd to 24,000 vpd, and thus only the segment near US 70 is approaching the 24,000 vpd LOS D capacity. The 2040 volume, however, is projected to range from 24,000 vpd to 39,000 vpd. This will create volume-to-capacity ratios from 1.0 to 1.5, an indication of heavy travel delays on a key corridor. The 2011 AADT for the two-lane segment of 11,000 vpd, which given the 12,400 vpd LOS D capacity, is creating some delays and safety concerns (e.g., passing vehicles on a two-lane road). The 2040 volume is expected to increase to 18,000 vpd, causing many delays and crashes if additional capacity is not added. Although long-range plans provide for additional lanes on I-85 and I-540, this additional capacity is likely to have little effect in drawing traffic away from NC 98 given the ten plus mile distance between those roadways and the expected residential growth.

There are other transportation issues on NC 98 besides congestion. The US 70/NC 98 bridge is considered functionally obsolete. The East End Connector project, which started construction in 2015, will make needed improvements to this bridge. Intersection delay is currently not a problem. The intersections on the NC 98 corridor have a level-of-service of C or better (i.e., A or B) based on the 2014 DCHC MPO Mobility Report Card.

The current and future residential development in the NC 98 area and the expected retail development on NC 98 will generate increased bicycle, pedestrian, and transit traffic. Sidewalks and bike lanes are rare, and bus stops do not have any amenities. The CTP recommends a bike lane for the complete extension of the NC 98 corridor and sidewalks to fill any of the existing gaps. In addition, NC 98 roadway improvements need to consider safe crossing treatments for bicycle and pedestrian traffic that cross NC 98.

The US Army Corps of Engineers and resource agencies should be included in the environmental analysis stage of the project development very early. Environmental impacts will be a concern and likely have an impact on the design and viability of adding lanes to this roadway. NC 98 crosses over Lick Creek and Little Lick Creek, and the Lick Creek section contains wetlands, Army Corps of Engineers property and critical watershed. The entire length of this project segment is within either a protected or critical watershed.

Barbee Chapel Road (SR 1110) (NC 54 to Farrington Mill Road (SR 1109))

Barbee Chapel Road (SR 1110), from NC 54 to Farrington Mill Road (SR 1109), is currently a two-lane undivided suburban road that does not provide adequate pedestrian and on-road bicycle facilities. Improvements are needed to accommodate pedestrian and bicycle traffic and improve connectivity between Chapel Hill, Chatham County, Durham, and Research Triangle Park.

This section of Barbee Chapel Road currently has a 60-foot right-of-way, sidewalks at a few locations, and no bicycle lanes. The 2011 AADT is 11,000 vehicles per day (vpd); by 2040, the AADT is expected to be 19,100 vpd compared to a LOS D capacity of 11,600 vpd for the existing right-of-way. There are mostly residential units along this stretch of Barbee Chapel Road/Farrington Road and plans to build more residential units nearby as well. The traffic around Barbee Chapel Road will only increase with the increased development around this area. This route also serves as a connection to developing Chatham County neighborhoods and as a relief route for nearby NC 54 and I-40. This route is part of the Triangle Commuter Bike Initiative.

The current and planned residential development around Barbee Chapel Road will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities, and many of the bus stops do not have any amenities and do not include bus pull-outs resulting in blocked traffic. The need for pedestrian, bicycle, and transit facilities will only increase with additional development around Barbee Chapel Road. Bicycle lanes have been proposed along this route in the Durham Comprehensive Bicycle Transportation Plan. The DurhamWalks! Pedestrian Plan recommends sidewalks on both sides of this route.

Carver Street Extension (Danube Lane (SR 1648) to Hamlin Road (SR 1634))

East Carver Street needs to be extended from Danube Lane (SR 1648) to Hamlin Road (SR 1634) to improve east-west connectivity in northern Durham County. This area has recently experienced significant residential growth and East Carver Street provides access to the retail, medical and commercial facilities clustered along US 501 Business (North Roxboro Street) and Ben Franklin Boulevard. A two-lane roadway with sidewalks and bicycle facilities is proposed. The only other east-west connectors in this area, Hebron Road (SR 1656) and Old Oxford Road (SR 1004), are about 1 ½ miles apart along US 501 Business (North Roxboro Street). This project is funded in the city of Durham Capital Improvement Program (CIP), the funding source being local traffic impact fees, and the City will also manage the project. Right-of-way acquisition and final design were underway in the fall of 2015 with construction to begin within the next year.

South Churton Street (Eno River Bridge to I-40), TIP No. U-5845

Traffic volume on all segments of South Churton Street (SR 1009) from I-40 to the Eno River is projected to exceed LOS D capacity, 11,600 vehicles per day (vpd), by 2040 with expected volumes exceeding 21,000 vpd. Improvements are needed in order to relieve anticipated congestion and to maintain a minimum LOS D on the existing facility. This section of South Churton Street currently has a two-lane section from I-40 to Oakdale Drive (SR 1133) with some intersection improvements. The cross-sections convert to a three-lane profile from Oakdale Drive to north of Orange Grove Road (SR 1006) and converts back to a two-lane section before crossing bridge 240 over the Southern Railroad.

This corridor provides significant access to neighborhoods and shopping areas throughout Hillsborough as well as connecting all portions of town to both I-85 and I-40. With only two bridges over the Eno River in town, this route is the primary north-south travel conduit. Significant development and redevelopment along this corridor is also projected in the town's land use plan. The anticipated development will be compact in nature increasing the need for bicycle and pedestrian improvements in the corridor to more seamlessly connect the entire community and maximize the options to use alternate modes of transportation. The town also plans a passenger rail station near the intersection of Orange Grove Road and South Churton Street, which will also serve as a transit hub for the existing services in the community.

The CTP project proposal is to provide a four-lane divided cross section with a raised median for this facility to better accommodate the projected 2040 volume. Bike lanes and sidewalks are also included along the project length.

Eno Mountain Road (SR 1148) & Mayo Street (SR 1192) at Orange Grove Road (SR 1006) Intersection, TIP No. U-3436

The Eno Mountain Road (SR 1148) and Mayo Street (SR 1192) intersections with Orange Grove Road (SR 1006) are suburban intersections that need improved safety and traffic flow. Improvements are also needed for adequate pedestrian, on-road bicycle and bus accommodations.

The Eno Mountain Road and Mayo Street intersections with Orange Grove Road are two 3-leg intersections that are approximately 300 feet apart. Orange Grove Road is the east-west street, with Eno Mountain Road intersecting it from the north and Mayo Street intersecting it from the south.

All three roads are two-lane undivided, have 60-foot right-of-ways, no sidewalks, and no bicycle lanes. The 2013 AADT on Orange Grove Road is 7,600 vehicles per day (vpd); by 2040, the AADT is expected to be 9,100 vpd with 11,100 vpd and 8,700 vpd on the Eno Mountain and Mayo Street legs, respectively. These three roads combined make an alternative route to get from South Hillsborough to downtown Hillsborough without using congested Churton Street (SR 1148). Orange Grove Road is also scheduled to be extended east to US 70 Business, creating a critical east-west connection south of the river. This extension will greatly increase the future traffic through this intersection.

Nearby residential and commercial development, in addition to any future development, will significantly increase traffic along these routes. The current and planned development around Eno Mountain Road, Mayo Street, and Orange Grove Road will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities, and many of the bus stops do not have any amenities and do not include bus pull-outs resulting in blocked traffic. The need for pedestrian, bicycle, and transit facilities will only increase with additional development around these three roads.

Erwin Road (SR 1307) (US 15-501 (Fordham Boulevard/Durham-Chapel Hill Boulevard) to NC 751)

Erwin Road (SR 1307), between US 15-501 (Fordham Boulevard/Durham-Chapel Hill Boulevard) and NC 751, is a two-lane minor thoroughfare road that does not provide adequate pedestrian and on-road bicycle facilities. Improvements are needed to accommodate pedestrian and bicycle traffic and improve connectivity between Durham and Chapel Hill. There are two potential project sections: US 15-501 to Whitfield Road (SR 1731); and, Whitfield to NC 751.

This section of Erwin Road currently has a 60-foot right-of-way, sidewalks at certain locations, a brief stretch of wide shoulders from Weaver Dairy Road (SR 1733) to I-40, and no bicycle lanes. The 2013 AADT is 8,800 vehicles per day (vpd); by 2040, the AADT is expected to be 14,200 vpd compared to a LOS D capacity of 11,600 vpd for the existing right-of-way. There are many residential units along Erwin Road with some schools, churches, and shops along it as well. Erwin runs parallel to US 15-501 and offers a direct connection between Durham and Chapel Hill. It is a convenient route for access to Duke University. In addition to inadequate shoulder width, there are several intersections with inadequate sight distance. Improvements are needed to improve safety for motorists, bicyclists, and pedestrians.

The development around Erwin Road will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities, and many of the bus stops do not have any amenities and do not include bus pullouts resulting in blocked traffic. The need for pedestrian, bicycle, and transit facilities will only increase with additional development around Erwin Road. Bicycle lanes have been proposed along this route in the Durham Comprehensive Bicycle Transportation Plan. The DurhamWalks! Pedestrian Plan recommends sidewalks on both sides of Erwin Road within the Durham city limits. In the Chapel Hill Pedestrian Facilities Plan, sidewalks have been proposed from US 15-501 to I-40, crossing improvements

have been proposed at US 15-501, Sage Road, and just north of Chippoaks Drive, and a greenway has been proposed from just north of Chippoaks Drive to I-40.

Estes Drive Extension (SR 1780) (Seawell School Road (SR 1843) to NC 86 (Martin Luther King Jr Boulevard))

Estes Drive Extension (SR 1780), from Seawell School Road (SR 1843) to NC 86 (Martin Luther King Jr Boulevard), is currently a two-lane undivided minor thoroughfare that does not provide adequate pedestrian and on-road bicycle facilities, and is projected to exceed its vehicular capacity by 2040. Improvements are needed to accommodate pedestrian and bicycle traffic and improve connectivity between Carrboro and Chapel Hill. Estes Drive currently has many residential areas, a couple schools, and a small airport located nearby.

This section of Estes Drive Extension currently has a 30-foot right-of-way, sidewalks at certain locations, and no bicycle lanes. The 2013 AADT is 12,000 vehicles per day (vpd); by 2040, the AADT is expected to be 14,000 vpd compared to a LOS D capacity of 12,900 vpd for the existing right-of-way. This volume produces a volume- to-capacity ratio of just 1.1, which is unlikely to require a widening project. Estes Drive Extension may see significant traffic increases by 2040 due to Chapel Hill's plans to construct a northern campus, "Carolina North," for the University of North Carolina (UNC) just north of Estes Drive Extension. The development of Carolina North will include improvements to the roadway, which may include widening and intersection improvements at NC 86.

The current development around this section of Estes Drive Extension, in addition to the future development (especially with Carolina North to be built along Estes Drive Extension), will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities, and many of the bus stops do not have any amenities and do not include bus pull-outs resulting in blocked traffic. The need for pedestrian, bicycle, and transit facilities will only increase with additional development around Estes Drive Extension, especially with the construction of Carolina North. The development of this new campus for UNC will drastically increase non-motorized and transit traffic along Estes Drive Extension. In the Carrboro Bicycle Network Plan, bicycle lanes are proposed from Estes Drive Extension to the Carrboro town limits (the railroad tracks). The Chapel Hill Bicycle Facilities Plan proposes bicycle lanes from Seawell School Road to Martin Luther King Jr Boulevard.

Sidewalks have been proposed along the east side of Estes Drive Extension (from North Greensboro Street (SR 1772) to town limits) in the Carrboro Bicycle Policy and Sidewalk Policy. The Chapel Hill Pedestrian Facilities Plan has proposed sidewalks from Martin Luther King Jr Boulevard (NC 86) to the proposed Carrboro sidewalks. In both the Carrboro and Chapel Hill pedestrian plans, the Bolin Creek Greenway is proposed to cross underneath Estes Drive with a proposed underpass.

Estes Drive Extension (SR 1780) (North Greensboro Street (SR 1772) to Seawell School Road (SR 1843))

Estes Drive Extension (SR 1780) from North Greensboro Street (SR 1772) to Seawell School Road (SR 1843) is one of the only routes on the western end of Town to travel from Carrboro to Chapel Hill. It is a narrow two-lane road at the North Greensboro end and gradually widens as it crosses the railroad tracks and approaches Seawell School Road. There are currently no bike lanes or sidewalks along the entire corridor, though the shoulders widen to 3-4 feet after crossing the railroad tracks. The segment sees an average of 13,000 vehicles daily, which exceeds the LOS D capacity.

The only significant congestion on this segment of roadway is at the Estes Drive Extension/North Greensboro Street intersection, which will be improved in 2018 (TIP # U-5846). Additional travel lanes cannot be added to this segment of Estes Drive Extension due to the close proximity of residential homes to the roadway. Bike lanes and sidewalks are currently being considered, and additional safety improvements may help to increase capacity.

Eubanks Road (SR 1727) (Rogers Road (SR 1729) to NC 86 (Martin Luther King Jr Boulevard))

Eubanks Road (SR 1727), from Rogers Road (SR 1729) to NC 86 (Martin Luther King Jr Boulevard), is currently a two-lane undivided minor thoroughfare road. Improvements are needed to adequately accommodate pedestrian and bicycle traffic and increase safety.

This section of Eubanks Road currently has a 60-foot right-of-way, sidewalks at select locations, and no bicycle lanes. The 2013 AADT is 8,000 vehicles per day (vpd); by 2040, the AADT is expected to be 21,800 vpd compared to a LOS D capacity of 12,400 vpd for the existing right-of-way. There are some residential units, some offices, a landfill, and a park-and-ride lot along this stretch of Eubanks Road. Many residential units and a town/village center are proposed along this section of Eubanks Road and nearby. Eubanks Road is an important connector route between NC 86 (Martin Luther King Jr Boulevard) (which connects to I-40) and Old NC 86 (northwestern end of Carrboro), and should see significant traffic increase due to its connectivity and proposed development.

The current and planned development around Eubanks Road will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities, and the park-and-ride lot is almost at capacity in use. The need for pedestrian, bicycle, and transit facilities will only increase with additional development around Eubanks Road. In the Chapel Hill Bicycle Facilities Plan, there is a proposed greenway path that will cross Eubanks Road near the park-and-ride lot (with proposed crossing improvements where it crosses) and another greenway path that will cross Eubanks Road near NC 86. There are proposed sidewalks along the south side of Eubanks Road from Millhouse Road (SR 2200) to NC 86 in the Chapel Hill Pedestrian Facilities Plan.

Fayetteville Road (SR 1118) (Woodcroft Parkway to Riddle Road (SR 1171))

Fayetteville Road (SR 1118), between Woodcroft Parkway and Riddle Road (SR 1171), is currently a two-lane road except for the area immediately adjacent to Martin Luther King Jr Parkway, which has multiple through lanes and turning lanes. There are three potential project sections: Riddle Road to Martin Luther King Jr Parkway; Martin Luther King Jr Parkway to Barbee Road; and, Barbee Road to Woodcroft Parkway. A 4-lane divided cross-section with sidewalks, bicycle lanes and bus facilities is proposed for accommodating future traffic volume. Fayetteville Road serves as a major north-south route that connects the growing residential, retail and commercial areas around the Streets at Southpoint Mall with downtown Durham.

This section of Fayetteville Road currently has a 60-foot right-of-way, an existing greenway path running parallel to the road, sidewalks at select locations, no bicycle lanes, and almost a dozen bus stops. The 2013 daily traffic count ranges from 15,000 vehicles per day (vpd) north of Martin Luther King Jr Parkway to 19,000 vpd between Martin Luther King Jr Parkway and Barbee Road. The traffic counts south of Barbee Road have increased by 2,000 the last several years. The LOS D capacities range from 12,700 vpd to 14,600 vpd on the two-lane sections of this roadway, and the 2040 projected traffic volume will be as high as 22,000 vpd, putting the projected volume at 70% over the capacity, i.e., v/c is 1.7.

There are many neighborhoods, restaurants, shops, schools, and a church along this stretch of Fayetteville Road. A high level of new residential, retail and commercial development is expected in the future, including a large residential development near the Juliette Drive intersection. Major retail centers anchored by Lowes Home Improvement and Wal-Mart were recently constructed at the Martin Luther King Jr Parkway intersection and along Martin Luther King Jr Parkway. Bicycle, pedestrian and transit facilities are needed to connect the different land uses and to connect to the American Tobacco Trail. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic and there are no bicycle facilities. Many of the bus stops do not have any amenities and do not include bus pull-outs resulting in blocked traffic. The Durham Comprehensive Bicycle Transportation Plan proposed bicycle lanes along this route, and the DurhamWalks! Pedestrian Plan recommends sidewalks on both sides of the roadway.

The city of Durham has funded two phases of this project using traffic impact fees. The realignment of Buxton Road and Riddle Road to form a single intersection with Fayetteville Road is funded in the City's Capital Improvement Program (CIP) and construction is scheduled to begin in early 2016. The additional lanes in the East Cornwallis Road (SR 1121) to Barbee Road section are to start construction in fall 2016.

North Greensboro Street (SR 1772) (Estes Drive Extension (SR 1780) to East Main Street (SR 1010))

This segment of North Greensboro Street (SR 1772) is one of the primary arteries through downtown Carrboro. It runs from a very congested intersection with Estes Drive Extension (SR 1780)/ past single and multi-family residential, and into dense high-volume commercial development. The northern portion of the roadway has a speed limit of 35 mph and decreases to 20 mph as it enters the commercial area. It is primarily two lanes, but has a right-turn lane at Estes Drive Extension and a center lane at the highest volume commercial area. Currently 14,000 vehicles travel this segment daily, putting the

roadway at a daily volume greater than the LOS D capacity of this segment. In 2040 the projected volume will be 17,500 vpd, with a volume-to-capacity ratio of 1.5. The segment has been identified as 'needing improvement'.

The primary sources of congestion on this segment of roadway are the intersections at either end. The Estes Drive Extension/North Greensboro Street intersection experiences severe delays, but will be receiving improvements in 2018 (TIP# U-5846) to ease congestion. The intersection at the south end of the corridor, North Greensboro Street and East Main Street (SR 1010), is also very congested and should be improved to ease traffic flow. North Greensboro Street should not be widened to avoid significant impacts to residential and commercial development along the corridor. Bike and pedestrian improvements and some safety improvements would likely increase capacity of the roadway.

South Greensboro Street (SR 1919) (East Main Street (SR 1010) to NC 54)

This section of roadway leads from NC 54 into the heart of downtown Carrboro. It is a narrow, two-lane road lined with single and multi-family homes. There is some office and storage space at the bottom of the hill near NC 54, and a large commercial center has recently broken ground. This is also a major gateway road into Carrboro, with a current count of 12,000 vehicles per day. The 2040 projected count will produce a volume-to-capacity ratio of 1.3 and the road is identified as 'needs improvement'. However, adding travel lanes would greatly impact the neighborhoods because the residential and commercial buildings are very close to the roadway. Additionally, once in downtown Carrboro, Greensboro Street (SR 1919) remains a two-lane road, and widening just the southern portion would create even more of a bottleneck than already exists.

Suggested improvements to the road include adding bike lanes and sidewalks. While bike lanes are not currently planned (again, due to limited right-of-way), the 2016-2025 STIP includes construction of a sidewalk along one side of the roadway. TIP# U-4726DX, currently programmed for FY 2016, will construct a sidewalk from the north end of Old Pittsboro Road to NC 54. Suggested sidewalk improvements are recommended from the north end of Old Pittsboro Road to East Main Street. In addition, the mixed-use center being built at the intersection of Old Pittsboro Road and S Greensboro Street will construct a roundabout at the intersection to improve traffic flow.

Hillsborough Road (SR 1009)/North Greensboro Street (SR 1772) (Old Fayetteville Road (SR 1107) to Estes Drive Extension (SR 1780))

Hillsborough Road (SR 1009) is a primary thoroughfare through Carrboro. This segment runs from the rural buffer at the western end of Town, past McDougle Elementary and Middle schools, through residential neighborhoods, and ends at one of the busiest intersections in Carrboro (Estes Drive Extension (SR 1780) and North Greensboro Street (SR 1772)). The roadway currently operates at less than LOS D volumes, and is projected to remain at less than 1.0 volume-to-capacity ratio in 2040. The segment is projected to average almost 11,000 vehicles daily in 2040 and is deemed to 'need improvement' from Old Fayetteville Road to Estes Drive Extension.

The roadway does not experience significant congestion, except for peak hours near the schools and at the Estes Drive Extension/North Greensboro Street intersection. This intersection will be improved—likely in the form of a roundabout—in 2018 (TIP # U-5846)—which will ease peak hour congestion at that end of the roadway segment. Bike lanes and sidewalks were installed in response to the last call for corridor improvements. Additionally, there is transit service along the entire corridor that serves downtown Carrboro and Chapel Hill, and provides connection to other routes. Finally, Pathway Drive, just to the north of Hillsborough Road, was identified as a parallel route and takes a number of trips off of the roadway.

Homestead Road (SR 1777) (Rogers Road (SR 1729) to NC 86 (Martin Luther King Jr Boulevard))

Homestead Road (SR 1777), from Rogers Road (SR 1729) to NC 86 (Martin Luther King Jr Boulevard), is currently a two-lane undivided minor thoroughfare road. Improvements are needed to adequately accommodate pedestrian and on-road bicycle traffic and increase safety.

This section of Homestead Road currently has a 60-foot right-of-way, sidewalks at certain locations, and no bicycle lanes. The 2013 AADT is 7,200 vehicles per day (vpd); by 2040, the AADT is expected to be 13,600 vpd compared to a LOS D capacity of 11,600 vpd for the existing roadway. Currently, there are mostly residential units, three schools, and a couple of religious institutions along Homestead Road. There are plans for the construction of new residential, office, town/village center, and university developments near Homestead Road. The university development will be the north campus of UNC, which will create the need for the many other developments and a significant increase in traffic. With current and existing development along Homestead Road, a complete widening may not be feasible, but improvements to intersections and spot improvements are possible.

The current and planned development around Homestead Road will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian and bicycle facilities are discontinuous and inadequate for existing pedestrian and bicycle traffic. Many of the bus stops do not have any amenities and do not include bus pull-outs resulting in blocked traffic. The need for pedestrian, bicycle, and transit facilities will only increase with additional development around Homestead Road, especially the development of the Carolina North campus. In the Chapel Hill Pedestrian Facilities Plan, there are proposed sidewalks from High School Road (SR 1834) that will be built to connect with existing sidewalks that run from NC 86 to around Northern Park Drive.

The implementation of improvements to transit, pedestrian, and bicycle facilities should assist in reducing congestion in this corridor, since much of the traffic at peak hours is associated with the local schools, and providing alternative modes of travel may help to shift some trips away from personal vehicles.

Homestead Road (SR 1777) (Rogers Road (SR 1729) to Old NC 86 (SR 1009))

This segment of Homestead Road (SR 1777) is a windy, two-lane road through residential and agricultural areas. It is an area of high development pressure, with new subdivisions being built

frequently. There is only one road—Stratford Drive—that runs north-south and connects Homestead Road to Hillsborough Road (SR 1009) in the middle of Carrboro. Due to the limited connectivity of this part of Town, Homestead Road experiences a fair amount of traffic driving the entire length. There are currently 7,100 vpd traveling on this segment, making it operate at less than LOS D capacity. However, there is significant congestion in the morning and afternoon peak due to school traffic at the intersection of High School Road (SR 1834) and Homestead Road. The corridor is projected to more than double its AADT in 2040 to 15,500, which exceeds LOS D capacity. The segment has been identified as ‘needing improvements’ from Rogers Road to Old NC 86.

Additional vehicle lanes could jeopardize existing residential and agricultural land uses along the corridor. Bike lanes and sidewalks have been requested along the entirety of the corridor to increase multi-modal capacity. Intersection improvements, particularly improvements to the High School Road/Homestead Road intersection, would greatly alleviate congestion. Additionally, improvements to the drop-off and pick-up practices of the three schools adjacent to Homestead Road would likely reduce peak hour congestion.

Orange Grove Road Extension (South Churton Street (SR 1009) to US 70 Business), TIP No. U-5848

Orange Grove Road (SR 1006) is currently a two-lane undivided road that terminates just past the South Churton Street (SR 1009) intersection. South Churton Street (US 70 Business/NC 86), just north of its intersection with US 70 Business/NC 86, is currently exceeding capacity and traffic delays are expected to increase in the future. Additional connectivity is needed between Orange Grove Road and US 70 Business/NC 86 to provide an alternative route to South Churton Street. Having an alternative route will lessen the vehicle volume passing through the South Churton Street/US 70 Business intersection, and therefore maintain a LOS D along the section of Churton Street north of US 70 Business/NC 86, which is just south of downtown Hillsborough.

Orange Grove Road currently has a 60-foot right-of-way, no sidewalks, and no bicycle lanes. South Churton Street (south of US 70 Business) currently has a 100-foot right-of-way, no sidewalks, and no bicycle lanes. Churton Street (north of US 70 Business to US 70 Bypass, in downtown Hillsborough) has a 60-foot right-of-way, sidewalks at certain locations, and no bicycle lanes. The 2013 AADT along Churton Street (north of US 70 Business to US 70 Bypass) is 20,000vpd, causing substantial traffic delays on a roadway that only has a LOS D capacity of 11,600 vpd. Extending Orange Grove Road would provide more connectivity for drivers and a means to use an alternate road to bypass the heavily congested Churton Street route. In addition, the town of Hillsborough has developed a planned rail station and government services development adjacent to this corridor.

The current residential and commercial development around South Churton Street and Orange Grove Road, in addition to planned developments, will generate increased bicycle, pedestrian, and transit traffic. The current pedestrian facilities are discontinuous and inadequate for existing pedestrian traffic. There are no bicycle facilities, and many of the bus stops do not have any amenities and do not include bus pull-outs resulting in blocked traffic. Additional transit routes will serve the proposed rail station. The need for pedestrian, bicycle, and transit facilities will only increase with additional development along South Churton Street. Four foot shoulders are proposed along this section of Orange Grove Road and along South Churton Street from I-40 to the Eno River in the DCHC MPO 2040 Metropolitan

Transportation Plan (MTP). The related widening project along South Churton Street also calls for the installation of sidewalks and bike lanes from the Eno River to I-40.

NC 86 South (Pittsboro Street) (West Cameron Avenue to NC 86 North (South Columbia Street))

Pittsboro Street (NC 86 South) runs from West Cameron Avenue to NC 86 North (South Columbia Street) and is a main thoroughfare down the West side of UNC's campus. The road segment is the continuation of NC 86 heading to the south and corresponds with South Columbia Street (NC 86) heading to the north. The 2013 AADT is 9,100 vpd; by 2040, the AADT is expected to be 11,100 vpd compared to a LOS D capacity of 12,700 vpd for the existing right-of-way. Indicating that it will still be a competitive segment in 2040 if all things stayed the same; however, the planned Bus Rapid Transit (BRT) route makes a change to this road segment necessary. In order to keep the area competitive at moving traffic and additional buses with designated right-of-way, it will be necessary to expand capacity on this segment.

Woodcroft Parkway Extension (NC 751 to Garrett Road (SR 1116)), TIP No. U-5823

Woodcroft Parkway runs west from Carpenter Fletcher Road to NC 751 (Hope Valley Road) on the east. Connecting the terminus of Woodcroft Parkway to the next road west, Garrett Road (SR 1116), would increase both time and route efficiency when travelling around the area. Improvements such as this are needed to increase grid connectivity and to divert traffic away from the already overloaded Garrett Road and NC 751 intersection.

Woodcroft Parkway is predominantly a two-lane, undivided collector street, although there are lengths at which the road is divided by a grassy median. With the current and future developments around NC 751 and Garrett Road, there will be a significant percent increase in traffic congestion on this stretch of NC 751 and Garrett Road, especially during the PM peak time frame when both the nearby high school (Jordan High School) and working commuters are on the road at the same time. These roadways have several tightly spaced intersections that are often overloaded at peak hours with queues exceeding available storage.

The current LOS D capacity for NC 751 south of Woodcroft Parkway is 31,600 vpd, and daily traffic counts are currently 18,000 vpd and expected to rise to 26,000 vpd in 2040. The current LOS D capacity for Garrett Road is 14,000 vpd, and daily traffic counts are 19,000 vpd and expected to rise to 25,000 vpd in 2040 resulting in a volume-to-capacity ratio of 1.8.

The extension of Woodcroft Parkway would provide a direct connection between the current residential areas along Woodcroft Parkway and Garrett Road to the shopping centers and retail stores clustered at the confluence of Woodcroft Parkway, NC 751, Garrett Road, and NC 54 and to employment centers via NC 54 and I-40. Woodcroft Parkway has a shared pedestrian/bicycle sidepath along the entire route from Hope Valley Road to Fayetteville Road. A portion of this sidepath is part of the city's Third Fork Creek Trail. Woodcroft Parkway also provides connectivity to the American Tobacco Trail.