RECOMMENDED PLAN

The next two major sections of this report, "Recommended Plan" and "Financial Plan", constitute the core elements of the full 2030 LRTP. These sections list all the various highway, transit, fixed-guideway and non-motorized projects to be implemented in order to best meet the current and forecasted travel demand, and identify the funding sources to pay for the projects.

Alternative Plan in Case of Plan Lapse

A so-called funding "lapse" could occur in the future and subsequently affect the implementation of the 2030 LRTP. A plan "lapse" usually occurs when federal grant funding to an MPO is frozen because the MPO long-range transportation plan or Transportation Improvement Program (TIP) does not meet federal air quality conformity requirements or the valid dates of the plan or TIP have passed.

In the case of a "lapse," this "Recommended Plan" will automatically become the alternative recommended plan, which includes only those projects deemed "exempt from regional emissions analysis" as defined in federal regulations Title 40, § 93.126 and § 93.127. The exempt status of projects is specified in the detailed listing of projects contained in the appendices of this document, and this status has been reviewed and approved by the appropriate federal oversight agencies, including the U.S. Department of Transportation/Federal Highway Administration and the U.S. Environmental Protection Agency.

Highways

Highways are the primary component of the 2030 LRTP. They serve both the automobile, which is the most popular transportation mode, as well as other modes such as bicycle and public bus transportation, and support strategies such as Intelligent Transportation Systems (ITS) and Transportation Demand Management (TDM). The main emphasis of the recommended highway plan is the preservation and maintenance of existing streets, roadways, and bridges. This vision is reflected in the fact that among the highway projects that are intended to increase road capacity, 68 percent of the projects, or 158 miles, are for increasing the capacity of existing highway alignments (usually by road widenings), compared to 32 percent of the projects, or 76 miles, for new roads. These percentages compare favorably with other U.S. metropolitan areas that are known for their support of non-automobile transportation such as transit, bicycling and walking.

The following summaries describe the eight most important highway projects in the 2030 LRTP:

East End Connector

Project Limits:	NC 147 to US 70 E, and, on US 70 north to NC 98
Proposed Cross-section:	New 6-lane freeway
Length:	2.5 miles
Total Cost:	$108,936,000
AQ Year:	2020

Purpose and Need: Provide limited-access mobility from the neighborhoods of north and east Durham, to the Research Triangle Park (RTP), airport, and Raleigh employment centers. TRM forecasts a significant reduction in congestion among the north-south arterials that pass through the neighborhoods in the center of the City of Durham (i.e., Gregson St., Duke St., Roxboro St., Alston Ave., and Avondale Drive) based on new transportation capacity from this project.

US 70

Project Limits:	Lynn Road to Wake County line
Proposed Cross-section:	6-lane freeway
Length:	4.1 miles
Total Cost:	$101,747,000
AQ Year:	2020

Purpose and Need: Provide limited-access mobility from City of Durham to fast growing airport and north Raleigh employment, commercial and residential areas, and connect with existing I-540 and future Northern Durham Parkway. Daily traffic count of 30,000 vehicles in 2003 indicates a relatively fast four percent annual growth rate, and the TRM forecasts substantial congestion in this key U.S. highway corridor without major capacity improvements.

I-85

Project Limits:	US 70 to Red Mill Road
Proposed Cross-section:	6-lane freeway
Length:	5.7 miles
Total Cost:	$68,420,000
AQ Year:	2020

Purpose and Need: Provide interstate, intrastate, and regional mobility in this important national highway corridor. Daily traffic count of 40,000 vehicles in 2003 indicates a very fast six percent annual growth rate, and the TRM forecasts substantial congestion without major capacity improvements.

Northern Durham Parkway

Project Limits:	Section A – US 70 to I-85 Section B – I-85 to Old Oxford Highway Section C – Old Oxford Highway to Roxboro Road
Proposed Cross-section:	New 4-lane divided parkway; Section C will be 2-lane with right-of-way for 4-lane divided
Length:	5.7 miles
Total Cost:	$131,954,000
AQ Year:	2020

Purpose and Need: Provides access from north and east Durham to major road systems such as I-85, US 70, US 501, and NC 98. These Durham areas are among the largest tracts of undeveloped land that lie within the urban growth boundary (i.e., area in which municipal services will be extended), and thus are expected to experience substantial growth in the next twenty years. The access from north Durham to I-85 and US 70 is expected to offer commute alternatives to the currently congested north-south arterials in central and eastern Durham.

Roxboro Road (501 North)

Project Limits:	Duke Street to Goodwin Road
Proposed Cross-section:	6-lane divided
Length:	2.7 miles
Total Cost:	$57,040,000
AQ Year:	2030

Purpose and Need: Provides access from north Durham to central Durham and major arterials. North Durham has a lot of undeveloped land that lies within the urban growth boundary, and thus is expected to experience substantial growth in the next twenty years. This section of Roxboro Road currently experiences some of the worst congestion in the area; this is a condition that is rapidly deteriorating.

I-40 High Occupancy Vehicle (HOV) Lanes

Project Limits:	Durham/Wake County line to NC 86 in Orange County
Proposed Cross-section:	New HOV lanes
Length:	16.6 miles
Total Cost:	$364,900,000
AQ Year:	2030

Purpose and Need: This is a principal regional travel corridor (between Durham/Chapel Hill and Raleigh), one of the main access points to the Research Triangle Park (RTP) employment center, as well as a major interstate and intrastate corridor. The RTP and airport area form a regional center that is certain to continue to experience fast commercial and employment growth. Daily traffic count of 143,000 vehicles in 2003 for the RTP section indicates a very fast eight percent annual growth rate, and the TRM forecasts continued congestion even with major capacity improvements.

The high occupancy vehicle (HOV) lanes are those with restrictions on the number of individuals each vehicle must have. In order to use these lanes during restricted hours, each vehicle must have a minimum number of occupants. During non-restricted hours, the number of passengers required is lifted. The intent of restricting the number of occupants is to encourage ridesharing, which in turn reduces the number of vehicles on the highway. With fewer vehicles, the HOV lanes operate generally with less congestion, but with greater throughput, i.e., person trips.

NC 147 (Durham Freeway) High Occupancy Vehicle (HOV) Lanes

Project Limits:	East End Connector to I-40
Proposed Cross-section:	New HOV lanes
Length:	4.8 miles
Total Cost:	$100,135,000
AQ Year:	2030

Purpose and Need: This is a principal regional travel corridor (from the City of Durham and northern Durham and Orange Counties to the TRP and Wake County municipalities), and one of the main access points to the Research Triangle Park (RTP) employment center. The TRM forecasts continued congestion even with major capacity improvements. See the preceding project description, I-40 HOV lanes, for a description of HOV lanes.

NC 147 (Triangle Parkway)

Project Limits:	I-40 to McCrimmon Parkway (Wake County)
Proposed Cross-section:	New 6-lane freeway
Length:	2.4 miles (segment in Durham County)
Total Cost:	$70,039,000
AQ Year:	2020

Purpose and Need: Provides mobility from fast growing southeast Durham County and east Wake County to RTP employment center, City of Durham and major thoroughfares such as I-40. Daily traffic counts in parallel corridors such as NC 54, NC 55 and I-40 are experiencing up to eight percent annual growth rates. It will provide access to central and southern RTP.

Figure 34 is a map showing all the highway projects, depicting both the type of improvement and the completion year. Appendix A is a list of these projects, as well as key project data such as length, cost methodology and totals, and completion year.

Roadway design is very important because it can have a significant impact on the manner in which the road will incorporate other transportation modes and relate to the surrounding "context" such as land use and people. As a result, the DCHC MPO has developed a set of typical roadway cross-sections that are to be used as a guideline during the project development and environmental analysis phases of implementing road improvements. See Appendix E for drawings of these cross-sections. These cross-sections are distinguished by the use of wide outside lanes and sidewalks to accommodate bicycling and walking, and medians to reduce the negative aesthetic impact that multi-lane roadways can have on communities. Of course, the final cross-section design of a road depends on many operational, planimetric, contour and land use factors, and thus design decision must be made on a case-by-case basis. Nonetheless, DCHC MPO policy is to promote, as appropriate, these typical cross-section guidelines in order to create more multi-modal, context-sensitive roadways.

Figure 34

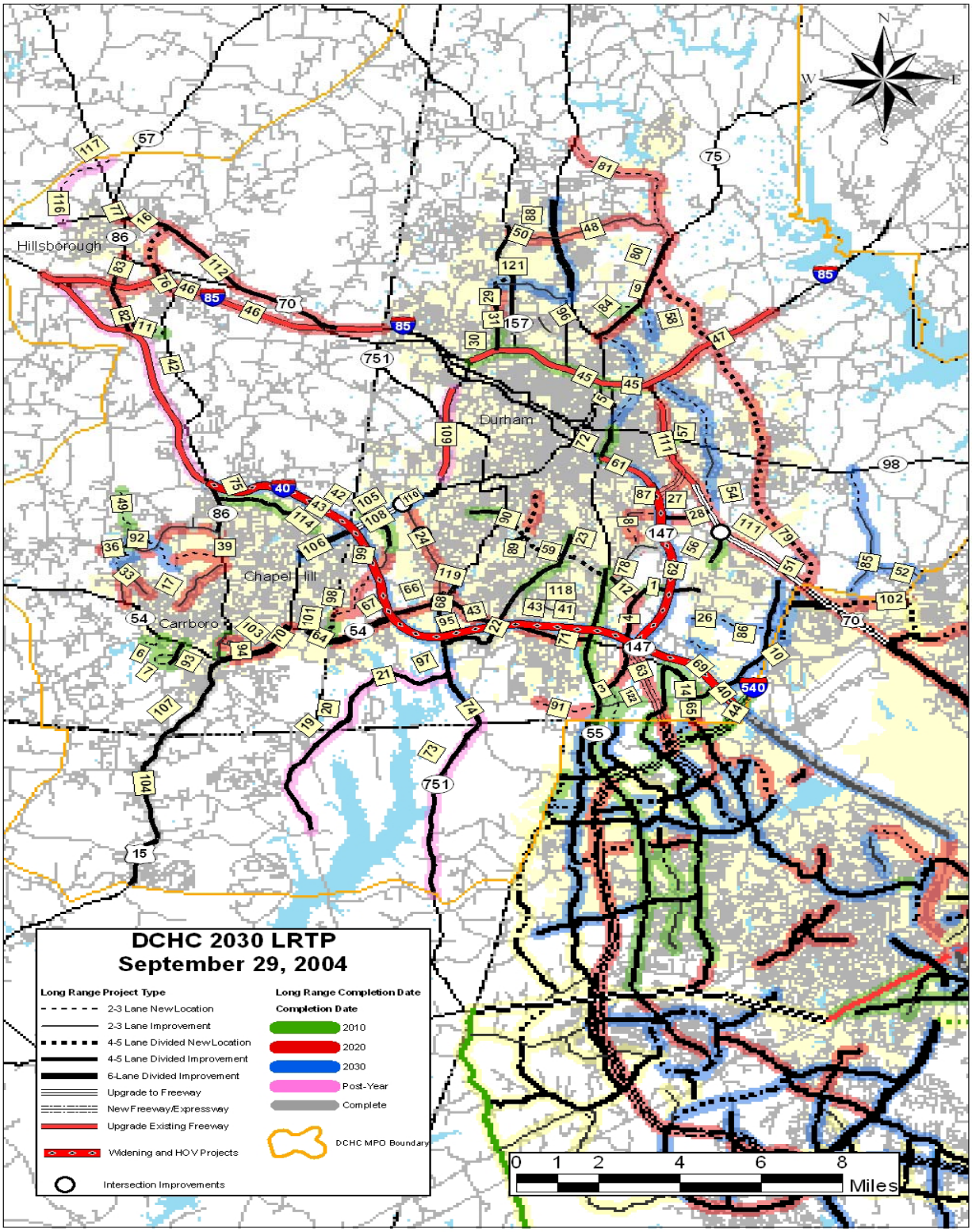

Hillsborough
Chapel Hill
Carrboro
Durham
DCHC 2030 LRTP
September 29, 2004
Long Range Project Type
2-3 Lane New Location
2-3 Lane Improvement
4-5 Lane Divided New Location
4-5 Lane Divided Improvement
6-Lane Divided Improvement
Upgrade to Freeway
New Freeway/Expressway
Upgrade Existing Freeway
Widening and HOV Projects
Intersection Improvements
Long Range Completion Date
Completion Date
2010
2020
2030
Post-Year
Complete
DCHC MPO Boundary
0 1 2 4 6 8
Miles

Figure 35 summarizes the highway projects by AQ Year, type (i.e., widening or new roadway), cost and miles, and Figure 36 shows the percentages of total projects, miles and costs by project type. There are a few key trends which merit mention:

- There is an emphasis on widening projects. Only 32 percent of the total miles are for new roadway projects (i.e., projects with new alignment). The proportion of new alignment projects is especially small in the 2010 period.

- The number of projects and project miles are proportionally higher for the 2010 period. Although this period represents only 23 percent of the total planning period (i.e., six of 26 total years), 38 percent and 32 percent of the projects and project miles are in this period.

- The number of projects and project miles are proportionally smaller for the 2030 period. Although this period represents 38 percent of the total planning period (i.e., ten of 26 total years), only 22 percent and 29 percent of the projects and project miles are in this period.

Figure 35
Highway Projects Summary by AQ Year, Type, Miles and Cost

	No. of Projects	Miles	Cost
2010			
New	15	13	$20,641,000
Widening	28	63	$105,873,000
2010 Total	**43**	**76**	**$126,514,000**
2020			
New Roadway	18	29	$398,804,000
Widening	27	62	$641,965,000
2020 Total	**45**	**91**	**$1,040,769,000**
2030			
New Roadway	15	35	$454,470,000
Widening	10	32	$424,898,720
2030 Total	**25**	**67**	**$879,368,720**
All Projects			
New Roadway	48	76	$873,915,000
Widening	65	158	$1,172,736,720
Grand Total	**113**	**234**	**$2,046,651,720**

Notes: 1) Project costs for the 2010 period are proportionally much lower because several large projects in this period were funded before 2005 (start of the 2030 LRTP planning period); 2) There are 124 highway projects in the plan. This table only includes those projects for which the principal objective is to increase roadway capacity, and thus intersection improvement and realignment projects are not included.

Figure 36
Highway Project Type as Percent of Total Projects

	New Roadway	Widening
Number of Projects	42%	58%
Total Project Miles	32%	68%
Total Project Costs	43%	57%

FIXED GUIDEWAY AND HIGH-CAPACITY TRANSIT

The proposed fixed guideway/high capacity transit plan provides considerable support to MPO goals related to transit, multi-modal transportation, and the provision of alternatives to the automobile. Fixed Guideway refers to rail, bus rapid transit, and other types of transit services that operate on permanent routes that are often grade-separated facilities or special highway travel lanes. These routes serve corridors in which the land use, e.g., large employment centers and relatively dense residential areas, will generate a high number of trips, especially during the morning and afternoon weekday peaks. In order to form effective multi-modal networks, the fixed guideway plan is coordinated with the bus transit and bicycle and pedestrian plans to provide bus feeder service, and bicycle and pedestrian access to the fixed guideway stations.

The 2030 LRTP identifies these projects as corridor systems, and thus the design details have not yet been determined. As a result, the 2030 LRTP includes by reference whichever alignment, service level, route, technology and other design details are identified in the continuing analysis and public review of these systems.

In reference to the US 15-501 fixed guideway corridor that is currently depicted along Cameron Avenue in Chapel Hill, two jurisdictions want to clarify their positions on future alignment decisions:

Town of Chapel Hill Statement:

The Town of Chapel Hill has proposed that the fixed guideway corridor between the University of North Carolina main campus and the Horace Williams property use an alignment along Franklin Street rather than Cameron Avenue. While the Town recognizes that no final alignment can be approved until further environmental analysis is completed, the Town Council has indicated a strong preference for a Franklin Street alignment. The Town also believes that until additional environmental analysis is completed for this corridor and a specific alignment approved, land use decisions tied to a specific alignment are premature.

Town of Carrboro Statement:

- The description of the fixed guideway corridor in the 2030 LRTP should remain as it was in the 2025 LRTP.

- Prior to the adoption of the next LRTP, the Durham-Chapel Hill-Carrboro MPO will undertake a study of the fixed guideway corridor to determine feasible alignments and appropriate vehicle technologies. This study would be similar to the major investment study previously completed for the US 15-501 corridor between Chapel Hill and Durham.

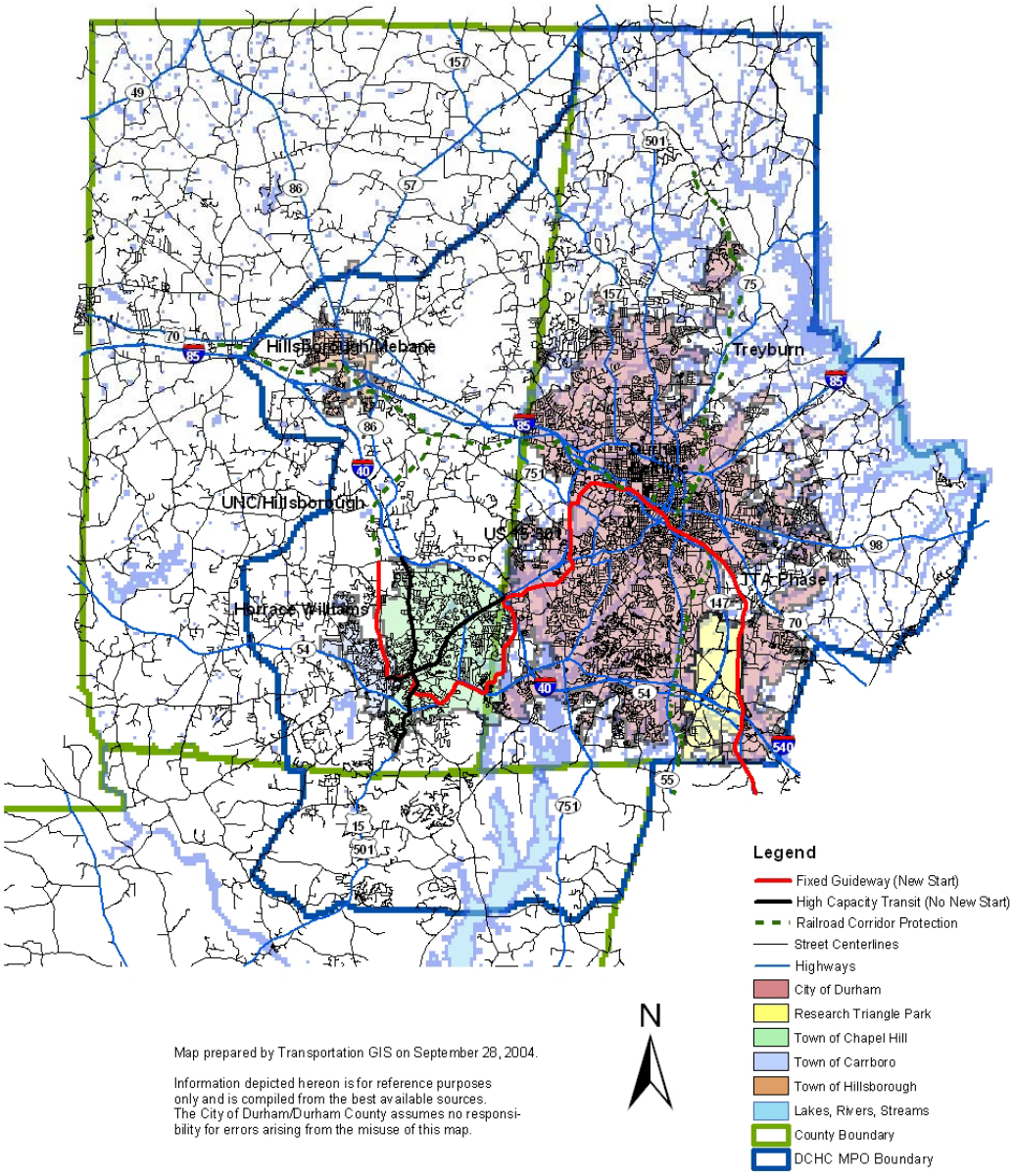
It is important to note that the MPO will seek FTA "New Start" funding only for the US 15-501 project.

Figure 37 is a map depicting the fixed guideway plan. Appendix B is a list of these projects, as well as key project data such as route description, service type, transit system, and headways.

Figure 37

Durham-Chapel Hill-Carrboro Metropolitan Planning Area

2030 Long Range Transportation Plan Recommended Fixed Guideway Component



The four major fixed guideway and high capacity transit projects are described in the following narratives.

TTA Rail – Phase I

Project Limits:	Ninth Street (Durham) to Government Center (downtown Raleigh)
Proposed Technology:	Double track rail system
Length:	28 miles (segments in Durham and Wake Counties)
Total Cost:	$552,370,000 (Durham County only)
AQ Year:	2010

Purpose and Need:

The Triangle Transit Authority regional rail system will provide high-quality, time-competitive and reliable regional transit service between Raleigh, the City of Durham, the RTP and Cary in the region's most congested travel corridor. Not only will the system provide an option to the use of congested roads for commuting and traveling in this region, but it will also support efforts to encourage more compact forms of development by attracting such development adjacent and near the train stations.

Phase I of the twelve-station TTA rail system will be operational in 2008. The system will run on double rail lines from Ninth Street in the City of Durham to downtown Raleigh, a length of 28 miles, and provide service to interim stop locations in Cary and the RTP, as well. The line will be supported by shuttle and local bus service and park-and-ride lots to connect many passengers to their final destination. The line will be extended to Duke Medical Center by the year 2020.

Initially, trains will run every fifteen minutes in peak travel hours and every 30 minutes in off-peak hours. Ultimately, trains will run every ten minutes in peak hours and every 20 minutes during off-peak hours and weekends. It is estimated that approximately 30,000 people will use the service each day by 2025.

TTA Phase II

Project Limits:	9th Street/Duke Medical Center and University (Durham) to UNC Horace Williams development (Chapel Hill)
Proposed Technology:	Fixed guideway; technology not yet determined
Length:	15.3 miles
Total Cost:	$400,539,728
AQ Year:	2020

Purpose and Need:

Phase II of the TTA fixed guideway system will connect the City of Durham and Town of Chapel Hill, including the Duke University and Medical Center and University of North Carolina (UNC) and its medical facilities. The project terminus will extend to the UNC Horace Williams property, which is planned to accommodate the largest share of the UNC campus growth in the next fifty years. The roadways in this corridor, such as US 15-501, are among the most congested in the region. The respective local governments have initiated an effort to encourage higher density, mixed-use

residential, commercial and employment development adjacent to and near the proposed Phase II stations.

Fixed Guideway refers to rail, bus rapid transit, and other types of transit services that operate on dedicated rights-of-way. This corridor is under continued study and the type of transit service, has not yet been selected. There will be from twelve to eighteen stations in this portion of the system.

High Capacity Transit (I-40/Carrboro Plaza)

Project Limits:	I-40 to Carrboro Plaza via US 15-501
Proposed Technology:	High capacity transit; technology not yet determined
Length:	7.5 miles
Total Cost:	$51,000,000
AQ Year:	2030

Purpose and Need: The system will provide a high level of transit service in a congested, high travel demand corridor that extends from western Carrboro (i.e., Carrboro Plaza) through the Franklin Street and US 15-501 corridors. This east/west corridor provides mobility to commuters between Chapel Hill, Durham, and I-40. The daily traffic counts in this corridor are growing at a fast four percent annual rate. High capacity transit is characterized by carrying a larger volume of passengers using larger vehicles and/or more frequent service than a standard fixed route bus system. High capacity transit can operate on exclusive rights-of-way such as a rail track or dedicated busway, or on existing streets with mixed traffic.

High Capacity Transit (Eubanks Road to Southern Village)

Project Limits:	Eubanks Road to Southern Village
Proposed Technology:	High capacity transit; technology not yet determined
Length:	7.5 miles
Total Cost:	$51,000,000
AQ Year:	2030

Purpose and Need: The system will provide a high level of transit service in a congested, high travel demand corridor that extends from the Eubanks Road/I-40 area to the Southern Village development in southern Chapel Hill. This corridor is the main north/south route to UNC and its medical facilities, and it adjacent to the UNC Horace Williams development. The daily traffic counts in this corridor are growing at a fast five percent to six percent annual rate along NC 86 and US 15-501. High capacity transit is characterized by carrying a larger volume of passengers using larger vehicles and/or more frequent service than a standard fixed route bus system. High capacity transit can operate on exclusive rights-of-way such as a rail track or dedicated busway, or on existing streets with mixed traffic.

Bus Transit (Public Transportation)

The recommended bus transit plan is geared toward achieving some of the major goals of the MPO, including the promotion of non-automobile transportation alternatives, and the establishment of a public transportation system that enhances mobility and economic development. As pointed out in a previous section of this report, "Trends, Deficiencies and Needs," transit ridership is increasing in the DCHC MPO area at an annual rate of approximately ten percent. During this period of transit growth, transit services for both fixed route and paratransit were expanded to include new routes, improved headways, expanded service coverage and demand responsive services for the elderly and handicapped and other transportation disadvantaged population.

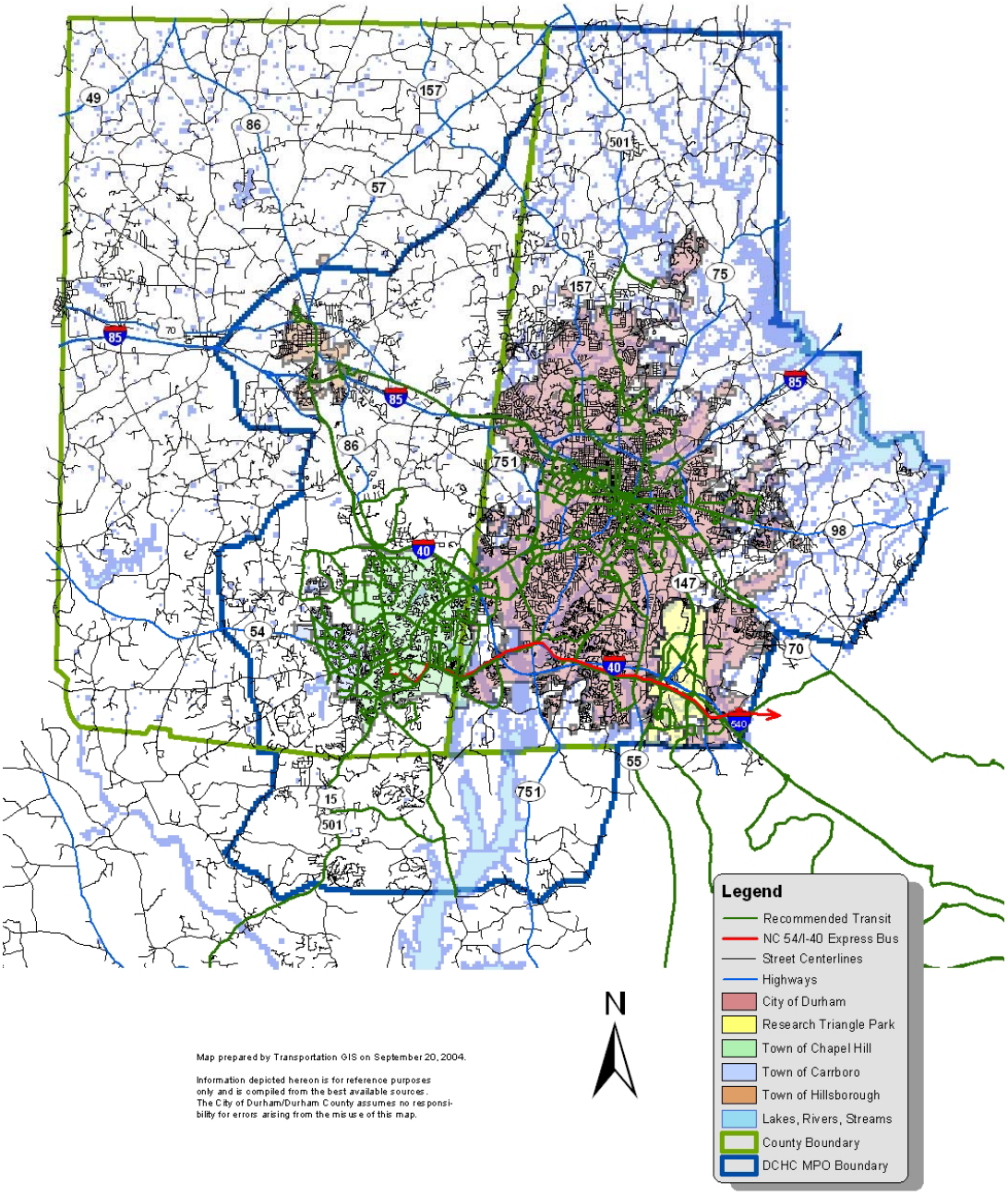
The recommended bus transit plan continues these improvements. Among the four transit systems, i.e., TTA, DATA, CHT, and OCT, there are 258 proposed local and express bus routes. Many routes are new or include high level services such as special feeder routes to proposed fixed guideway systems, and express service between employment centers, residential areas, and park-and-ride lots. Moreover, peak and off-peak headways on fixed-routes are to be reduced to ten-fifteen and 20-30 minutes, respectively. A fixed guideway facility is distinguished from regular transit in that it occupies a separate right-of-way or rail for the exclusive use of high-occupancy vehicles.

Figure 38 is a map depicting the bus transit projects. Appendix C is a list of these projects, as well as key project data, e.g., route description, transit system, operating and maintenance and capital costs.

Figure 38

Durham-Chapel Hill-Carrboro Metropolitan Planning Area

2030 Long Range Transportation Plan Recommended Transit Component



BICYCLE & PEDESTRIAN

Bicycle and pedestrian transportation are becoming integral forms of travel in the metropolitan area. The land use characteristics of local universities, business districts, and major activity centers encourage short trips that can be easily served by biking and walking. The urban centers of Durham, Chapel Hill, Carrboro and Hillsborough retain attractive, grid street patterns with retail and residential developments that lend well to biking and walking, and the scenery of the region's rural landscape provides opportunities for increased bike and pedestrian tourism and recreational cycling. Additionally, the area geography and mild year-round climate make these modes viable travel options.

In response to the increased popularity of bike and pedestrian travel, the MPO has set a goal to create "a pedestrian and bicycle system that provides an alternative means of transportation, allows greater access to public transit, and supports recreational opportunities." To best accomplish this goal, DCHC member governments coordinate planning efforts and strive toward the development of a safe, accessible and convenient network of regional bike and pedestrian routes. The DCHC MPO adopted a Regional Bike Plan in 1993, and in 2002, updated the regional bike route map to aide in the identification and preservation of important bike transportation corridors. Many local governments have also prepared their own citywide bicycle and pedestrian plans and/or facility inventories. The composite material from these plans and studies has contributed to bicycle/pedestrian corridor identification and facility proposals on a regional level, and guided the LRTP 2030 Bicycle and Pedestrian Plan project components.

Pedestrian Facilities

Pedestrian facilities in the DCHC area vary in type, condition and level of service. Urban areas within the MPO boundary are often outfitted with suitable sidewalk facilities, however many thoroughfares lack any pedestrian accommodations or relegate pedestrians to one side of the roadway. Historically, suburban development has been inattentive to pedestrian needs, leading to incomplete pedestrian networks within highly-populated commercial-residential areas. Also, many areas once classified as "rural" are seeing increases in development, and citizens are demanding pedestrian access from their neighborhoods to adjacent commercial or institutional uses. Local governments recognize all of these pedestrian needs, and are working toward filling the missing links in our local sidewalk networks.

On a regional level, the Transportation Advisory Committee has adopted a policy of inclusion for pedestrian projects within the DCHC MPO boundary. Local county, town and city governments have instituted sidewalk requirements for new development, and sidewalk upgrades are generally included in roadway construction projects. All roadway projects in the 'Highway Element' of the LRTP are expected to provide appropriate accommodations for pedestrians, concurrent with roadway improvements. Missing links and gaps in the pedestrian networks will be constructed retroactively and subsidized with $20,383,000 in MPO funding. Priority will be given to areas with heavy pedestrian traffic generators, such as schools, parks and business districts.

The MPO relies on the "NCDOT Planning and Designing Local Pedestrian Facilities" guide and/or local standards to identify appropriate facility type, and depends on local plans for project identification. Projects are prioritized on a regional level for funding allocation. The most recent local plans and inventories used for facility recommendations include:

- Carrboro's *Sidewalk Policy*, adopted March 7, 1989, states that the Town's "major objective is to provide safe pedestrian access to every point within the Town limits." The document outlines development requirements, inventories existing and proposed sidewalk locations, and prioritizes future pedestrian projects.

- Chapel Hill's 2002 *Mobility Report Card*, a component of the Town's 2000 *Comprehensive Plan*, quantifies pedestrian activity and inventories existing pedestrian infrastructure biennially. The data in this report is reevaluated biennially and the most recent report was issued in late 2004.

- The Town of Chapel Hill adopted a *Bicycle & Pedestrian Action Plan* in 2004 to provide increased guidance on local project priorities.

- Hillsborough's *Vision 2020 Plan*, adopted in 1991 and revised in 1998, calls for the development of pedestrian-friendly streets and expansion of the existing pedestrian network.

- Durham's 1996 *Sidewalk Plan* (map) and subsequent small area studies provide the best data for facility prioritization within the City and County at the present time. The City of Durham will embark on a pedestrian planning process in 2004 with an expected completion date in Spring 2006. Upon completion, the new Durham Comprehensive Pedestrian Transportation Plan will provide the best information and recommendations for pedestrian infrastructure, including expected project cost and implementation strategies.

Bicycle Facilities

The 2030 LRTP recommends extensive integration of bicycle needs into the design and construction specification of new highways and other future or ongoing transportation projects. The bicycle projects include off-road shared-use bicycle paths, on-road bicycle lanes and wide shared roadways in urban areas, as well as paved 4-foot shoulders on rural roads. Highway and transit project designs assume the provision of bike racks and other bicycle and pedestrian amenities at key locations such as park-and-ride lots, transit hubs and major activity centers.

The 1993 *Regional Bicycle Plan* for the Durham-Chapel Hill-Carrboro area suggested a number of routes, including local and inter-county projects to connect member communities. The LRTP 2030 Bicycle Element includes many of the corridors originally identified in 1993 as key links in the area's bicycle transportation system. In 2002, the MPO updated the LRTP bicycle project map, and at the request of local civic groups, added a number of new projects. The NCDOT "Bicycle Facilities, Planning and Design Guidelines" and AASHTO "Guide for Development of New Bicycle Facilities" act as construction standards for projects within the MPO area, and local agencies play a lead role in the implementation of new projects. Local plans also supplement the LRTP bicycle element by calling for additional projects and development requirements to complete the regional bicycle transportation network. These local plans include:

- Carrboro's *Bicycle Policy*, adopted March 7, 1989, states that the Town's "major objective is to increase the safety of bicycle riders in town" and strive to maintain its recognition as one of the best bikeway systems in the State. This document outlines development requirements, inventories existing and proposed bikeways, and prioritizes future bicycle projects.

- Orange County's *Bicycle Transportation Plan*, adopted August 5, 1998, evaluates the current conditions of the countywide bicycle network and recommends standards and a timeline for the construction of new facilities.

- Chapel Hill's 2002 *Mobility Report Card*, a component of the Town's 2000 *Comprehensive Plan*, quantifies pedestrian activity and inventories existing pedestrian infrastructure biennially. The most recent report was issued in late 2004.

- The Town of Chapel Hill adopted a *Bicycle & Pedestrian Action Plan* in 2004 which provides increased guidance on local project priorities.

- Durham's revised *Comprehensive Plan*, adopted in 2004, cites similar goals to the MPO, in that it calls for a pedestrian and bicycle system that offers an alternative means of transportation, allows greater access to public transit, supports recreational opportunities, and connects adjacent land uses. The *Comprehensive Plan* also calls for a strong coordination of transportation and land-use planning, as well as the development of an independent Bicycle Plan for Durham city/county.

The 243 bicycle projects listed in Appendix D of the LRTP 2030, total to $112,459,968 in overall project costs. Figure 39 provides key summary data, and Figure 40 is a map of the project locations.

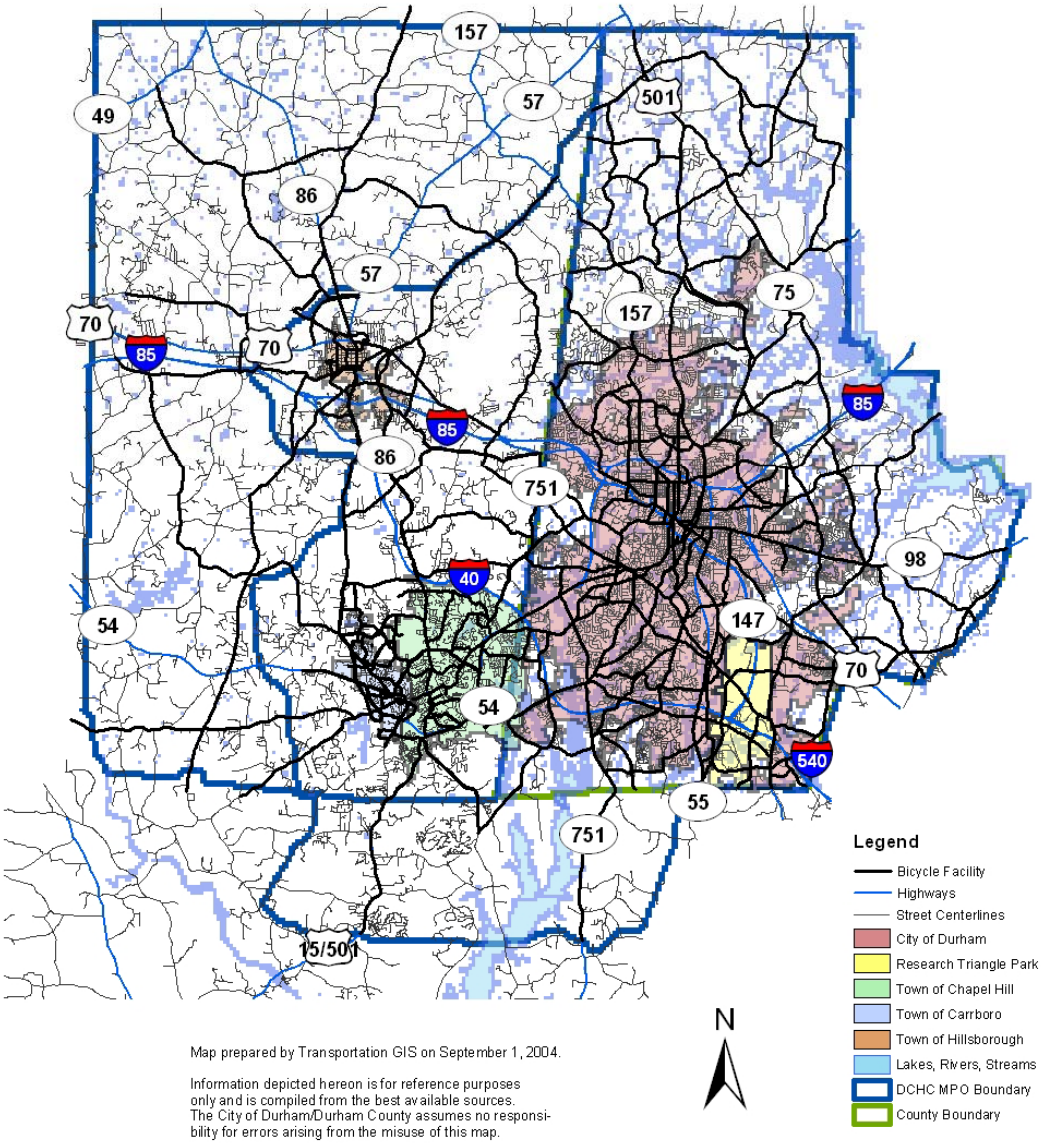
Figure 39: Bicycle Projects by Cost, Mileage and Municipality

City/County	Total Projects	Total Cost	Total Mileage
Durham	124	$ 64,191,668	399.4
Chapel Hill	38	$ 9,504,800	53
Carrboro	22	$ 4,801,200	17.2
Hillsborough/Orange County	58	$ 26,541,500	167
Chatham	5	$ 3,313,600	15

Figure 40

Durham-Chapel Hill-Carrboro Metropolitan Planning Area

2030 Long Range Transportation Plan Recommended Bicycle Component



Map prepared by Transportation GIS on September 1, 2004.

Information depicted hereon is for reference purposes only and is compiled from the best available sources. The City of Durham/Durham County assumes no responsibility for errors arising from the misuse of this map.

In addition to facility improvement projects included in the LRTP, the Durham-Chapel Hill-Carrboro MPO has devised a series of key recommendations from the 1993 *Regional Bicycle Plan* for local education, enforcement and encouragement programs. Outreach programs are essential elements of any bike and pedestrian friendly community, and complement the engineered components of a bicycle and/or pedestrian route network. The following recommendations are intended to increase bicycle and pedestrian safety and provide the incentive to get more people biking and walking in the MPO area.

Education

- Institutionalize bicycle safety education within the public school system.
- Provide bicycle instruction to adult cyclists.
- Educate motorists to share the road with cyclists.
- Establish a local fund for bicycle and motorist education.

Enforcement

- Update bicycle traffic laws.
- Develop an active enforcement program.
- Develop a bicycle registration program.
- Appoint a "Bicycle Liaison Officer".
- Develop a "Cops on Bikes" program.

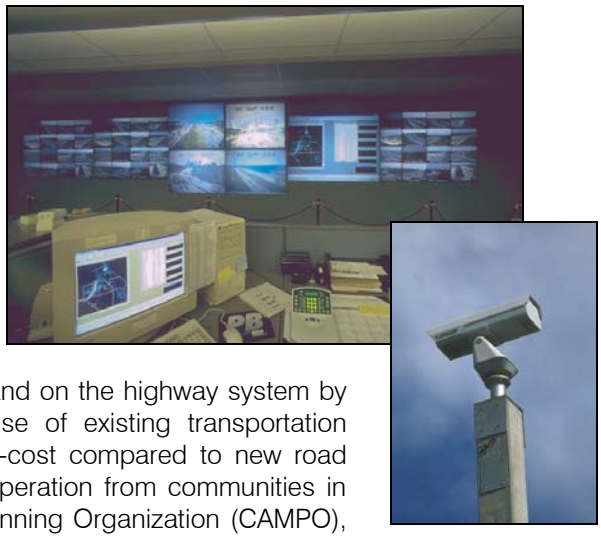
Encouragement

- Offer incentives to employers to encourage employee bicycle commuting.
- Conduct a well-publicized annual "Bike-to-Work" week.
- Develop links between bicycle facilities and mass transit.
- Develop a publicity campaign to raise awareness of cycling issues.
- Conduct an annual Regional Bicycle Festival.
- Publicize the Durham and Orange County region as "bicycle-friendly".
- Encourage community-based support for cycling.
- Develop cooperative relationships.

The 1993 *Regional Bicycle Plan* also calls for the development of supplementary resources, such as bicycle maps, safety-education materials and community action plans that provide a development strategy for the implementation of the four "E's" – engineering, education, encouragement and enforcement. Many member jurisdictions are proceeding toward great accomplishments in the outreach sector, including the national recognition of Carrboro in 2004 as a "Bicycle Friendly Community" by the League of American Bicyclists. With such progress already being made, it is certain that the DCHC MPO area will continue to advance toward a sophisticated, well-integrated bike and pedestrian transportation system over the next three decades.

TDM AND ITS/TSM

Transportation Demand Management



We cannot only rely on our transit, fixed guideway, and bicycle and pedestrian projects to provide adequate alternatives to single-occupancy vehicle trips (SOV). We must also better manage the demand for SOV trips to reduce congestion, improve air quality, and build a sustainable transportation network. Transportation Demand Management (TDM) includes strategies and actions that reduce SOV trips, spread traffic volumes away from peak travel periods, and improve traffic flow. TDM basically eases the demand on the highway system by providing travel options and making more efficient use of existing transportation facilities. TDM strategies, which are often relatively low-cost compared to new road alignment and road widening, require considerable cooperation from communities in our neighboring MPO, the Capital Area Metropolitan Planning Organization (CAMPO), because many citizens live and work in different MPOs, communities and municipalities.

The TDM plan, which mostly assumes voluntary participation from commuters and employers, includes the strategies in the following list.

- Durham County Commute Trip Reduction ordinance (required for organizations with 100, or more, employees);
- Flexible and staggered work hours, e.g., telecommuting, 4-day and 3-day workweeks, and 9-day two week work periods;
- Targeted parking fare increases, e.g., $3 increase on long-term parking rates.
- Transit fare reduction and elimination; e.g., employer transit subsidies, and the Chapel Hill Transit fare-free system.
- Part-time and full-time TDM coordinators at major employers and employment centers;
- Vanpool and carpool implementation, with a guaranteed ride home and regional pool matching services;
- Bike and pedestrian amenities at key locations;
- High Occupancy Vehicle (HOV) and High Occupancy Toll (HOT) facilities in the I-40 corridor.

ITS/TSM

Besides providing adequate alternatives to SOV trips, we need to make our current transportation system function more efficiently in order to build a sustainable transportation network. Intelligent Transportation Systems (ITS) is a set of diverse technologies, such as information processing, communications, control systems, and electronics that make the existing transportation infrastructure more efficient and safer. These technology systems tend to be region wide because of the interconnection among our road systems and our travel patterns. Given the high level of interdependency in our transportation network, these technology systems require tight coordination among the communities and MPOs, and subsequently demand new institutional arrangements. The DCHC MPO is working jointly with NCDOT, CAMPO, and private consultants to introduce a coordinated framework of ITS solutions, including:

Principal ITS Solutions

- Traffic control system in Durham that will be integrated with NCDOT to allow for regional coordination along the major interstates and arterials;
- Coordinated use of advanced transit technologies among TTA, DATA, and CHT, such as automated vehicle locator (AVL), automated passenger counter (APC), mobile data terminals (MDT), electronic fare collection, and passenger dispatch for paratransit service. These technologies have proven to improve transit schedule adherence and efficiency.
- Regional incident management program to enable local and State agencies to better communicate and coordinate services.
- Regional multi-modal traveler information center, which includes video surveillance of traffic trouble spots and variable message boards.

Transportation System Management (TSM) solutions also increase efficiency and safety by allowing the current transportation network to operate with less obstructions and increased capacity. These solutions include:

Principal TSM Solutions

- Widening of approach widths for key intersections;
- Installation and/or adjustment of traffic signals, including dynamic signal timing coordination;
- Provision of left and/or right turn lanes;
- Limitation or prohibition of driveways, turning movements, trucks, and on-street parking;
- Installation of traffic calming devices for residential neighborhoods;
- Planning for traffic circles and roundabouts at appropriate intersections.