

2. Charlotte

A. Regional trends

The greater Charlotte region consists of Mecklenburg County, NC and the western portion of Union County, including the city of Monroe. Within this region are about 800,000 residents. However, the de-facto urban region is much larger. Within just 20 miles there are 5 other medium-sized cities, from which commuting into Charlotte is substantial, and between which the previously rural space is rapidly filling up with residences, offices, and commercial sites. The greater commuting shed is considerably larger still, from Anson County on the east to Rowan County on the north, and Rutherford County on the east. The region also includes portions of South Carolina, particularly York County and Lancaster County, in its commuting shed.

The region is the largest in North Carolina, and has also seen one of the fastest growth rates in NC, if not the nation. During the 1990s the population of Mecklenburg County grew 36 percent, 1 ½ times the state rate and almost 3 times the national rate. More recently nearby Union County was the fastest growing county in the state since 2000. During the 1990s most of the employment growth was concentrated in the CBD area and the dispersed areas around the county (Arrowwood Road, Airport, SouthPark, Ballantyne, and University). Within the region, both population and employment growth is expected to be focused on the edges of Mecklenburg County (and the nearby areas of surrounding counties)¹. This population growth has been fueled by a number of factors, primary among which are consolidation in the banking and airline industries (Bank of America, Wachovia, USAir), an ideal climate, relatively low cost of living, retirement trends in the northeast (NY and NJ), low labor costs, right-to-work laws, and good accessibility made possible by improved highway access and progress on the Outer Belt². The region regularly makes national ‘top 10’ lists for places to migrate to or to start a business.

Growth in the greater Charlotte area is expected to continue at a rapid pace into the future. Table II.B.2.1 shows projections of basic information for the Charlotte region. The data are based on statistics provided by the MPO, and by the state to FHWA. The MPO-area population is expected to increase 60-90 percent over the next 25 years and VMT is also expected to sharply increase. The region’s conformity documents predict an 88 percent increase in VMT, to 35,975,000 daily, over the 25-year horizon. As the region merges with the surrounding areas of Concord, Gastonia, and York SC, it is expected to take on the characteristics of a much larger region very rapidly, with longer commutes and a ‘regional’ diameter approaching 70 miles across³. Thus within the forecast period, the region is likely to be as large geographically as present-day Atlanta, albeit at a lower density.

Table II.B.2.1: Regional Trends, Charlotte

Charlotte	MPO Data			FHWA Data		
	2000	2030	Pct Ch	2003	2030	Pct Ch
Population	794,517	1,513,805	90.5	725000	1185000	63.4

¹ MUMPO LPR, p. 6-2.

² Mecklenburg Union Metropolitan Planning Organization, 2030 Long Range Transportation Plan, 600 East Fourth St, Charlotte NC 28202, April 20, 2005, p. 4-2 ff.

³ MUMPO LRP, p. 1-1.

Charlotte	MPO Data			FHWA Data		
	2000	2030	Pct Ch	2003	2030	Pct Ch
Employment	568,883	1,060,798	86.5			
VMT (Thousands)	19097	35975**	88.3	19656	32127	63.4
Net Size	4672*	?		2826	4687	65.8
% Peak Hr LOS E/F	29.30%	63.70%		4.60%	4.20%	-0.4
Transit Work Share	2.60%			1.80%		

*MUMPO area, including most of Union Co.

**From conformity document 8/3/05, adjusted for normalized VMT.

The region's air pollution has been improving and was in attainment during the 1990's and until the recent tightening of the ozone standard, but is now in non-attainment for the 8-hour ozone standard⁴; however, the region is in conformity and air pollution has declined significantly in recent years and is expected to continue to decline even with increasing travel⁵.

B. Commuter Characteristics

Although the region completed a recent travel survey, the relevant comparative data for other cities is better seen by reviewing the recent Census. Table II.B.2.2 summarizes the characteristics of Mecklenburg County resident commuters for 1990 and 2000⁶. The Table shows that the region has grown sharply – about 36 percent – in just one decade; this compares with a growth rate of 21 percent for North Carolina and 13 percent of the US. Its 1990-2002 growth rate was about 3.05 percent per year – very rapid indeed⁷.

The region is also heavily dependent on private mobility and this dependency is increasing over time. About 6.7 percent of the county's 274,000 households do not have an auto available, down from 8.8 percent in 1990. About 79.2 percent of Charlotte commuting drives alone to work and another 12.5 percent carpool to work. The region's transit/taxi share, at 2.6 percent, has declined from 3.6 percent in 1990. (Although the CATS ridership is up recently, its service is up even more.⁸) Bike/walk has also declined; some increase might occur in denser developments, but not for *work* travel shares. On the other hand, the percentage of workers working at home has increased sharply, from 2.2 to 3.4 percent, and is now 32 percent larger than transit/taxi commuters.

Table II.B.2.2: Mecklenburg County Profile of Resident Commuters

	1990	%	2000	%	% Change
Population	511433	100	695454	100	36

⁴ MUMPO LRP, p. 1-2.

⁵ MUMPO Conformity Analysis, Amendment 1 (Draft), Charlotte DOT, 8/3/05.

⁶ US Census, Journey to Work, Mecklenburg County NC, 2000.

⁷ MUMPO LRP, p. 1-3.

⁸ Hartgen D, Policy versus Performance: Directions for North Carolina's Largest Transit Systems, Report for the John Locke Foundation, Raleigh NC 27601, May 2006. Available at www.johnlocke.org.

	1990	%	2000	%	% Change
Households	200125	100	273561	100	36
0-Vehicle	17539	8.8	18380	6.7	4.8
Workers 16+	277227	100	362991	100	30.9
Drove Alone	218060	78.7	287663	79.2	31.9
Carpooled	34685	12.5	45473	12.5	31.1
Public Trans and Taxi	9897	3.6	9331	2.6	-5.7
Bike/walk	6368	2.3	5586	1.5	-12.3
Motorcycle/other	2161	0.8	2626	0.7	21.5
Work at home	6056	2.2	12312	3.4	103.3
Mean travel time	22.1		26.0		
Drove alone			25.0		
Carpooled			27.8		
Public Trans and Taxi			44.7		
Bike/walk			12.0		
Motorcycle/other			66.1		
Working in Mecklenburg					
Total workers			473590		
0-car hh			15005	3.2	
Bus or trolley			8515		
0-car hh			3265	38.3	

Regional travel times for the Charlotte area follow national patterns. The average travel time for all commuters is about 26 minutes, up from 22.1 minutes in 1990. This increase is caused partially by the increasing workforce (more commuters living on the edges of the county and commuting longer distances) and somewhat more congestion (slowing travel speeds for some workers). Travel times for drive-alone commuters average 25 minutes. For carpoolers, the average is 27.8 minutes, and for transit riders, 44.7 minutes. (This is a significant disadvantage to choice riders using the transit system, which inhibits the ability of the transit system to attract new ridership.) As congestion increases, auto times may slow somewhat but the transit disadvantage is not likely to improve much. The city's light rail service may induce some nearby housing but this will not significantly change regional statistics.

In summary, the data for Charlotte suggest a rapidly growing region which is merging with its surrounding regions while increasing its use of private vehicles and work-at-home activity for commuting and lessening its dependence on transit. In spite of recent efforts to increase density within some transit corridors, the overall trend of

spreading residential and employment activity is not likely to abate; this trend is recognized in the region's plans⁹.

C. How much delay needs to be saved to hold congestion?

Congestion is a rapidly growing issue in the Charlotte region, and is likely to increase in visibility in the future. The significant increase in population and workforce both within the region and commuting into it from surrounding regions is likely to substantially raise commute times and total delay. Table II.B.2.3 summarizes our forecast for congestion statistics for the region. The region's current travel time index (TTI) is 1.31, meaning that the average commute takes 31 percent longer than the same trip in the off-peak. But by 2030, this index will be 1.62, about the same as current-day Chicago. The average travel time will increase substantially, by about 5.2 minutes, and average delay will double. Total regional commuting time will increase about 102 percent, from 278,000 hours daily to 562,000 hours daily. But there will be so many more workers on the road system that the total area's daily delay will grow by about 149,743 hours daily. *In other words, if regional planners wanted to hold commuting delay to its current level, they would have to take actions that, in total, save about 149,743 hours of travel time for the region's commuters.* As we will see below, this is substantially beyond the potential savings of the TIP and LRP to achieve. But even so this projected growth in delay is probably conservative since it does not account for additional travel time from in-commuters from other regions and assume a relatively modest growth in VMT.

TableII.B.2.3: Potential Increases in Commuting Delay, Charlotte UA

Item	Charlotte Urbanized Area			
	1995	2003	2030	Change 2003-30
Pop	551000	725000	1185000	460000
Commuters		384482	628385	243903
TTI	1.17	1.31	1.62	0.31
Mean Travel Time		21.66	26.82	5.16
Free Flow Tr Time		16.53	16.53	-
Free Flow DVHT		211885	346299	134414
Delay DVHT		65684	215427	149743
Total DVHT		277569	561726	284157
Ave Hrs Del/yr		42.7	85.7	43.0

D. What does the TIP and LRP say about congestion?

Mecklenburg County is one of a handful of regions in North Carolina that have enacted local sales taxes or other fiscal mechanisms for improving transit service. The ½-cent sales tax for 'public transportation' was approved by the voters in November 1998, and has since then generated about \$50-60 million/year for transit expansions. The

⁹ MUMPO LRP, p. 5-2.ff.

region’s long range transit plan¹⁰ identifies five radial corridors for upgrading to ‘rapid transit’, along with streetcar service, and predicts a four-fold increase in ridership as a result; that would bring the regional transit share to about 3 percent.

Perhaps not surprisingly therefore, the focus of both the TIP and the LRP is on transit improvements and related bike/pedestrian actions, not highways. The MUMPO TIP¹¹ and LRP together propose to spend about \$11.045B¹² on transportation improvements over the next 25 years. But the distribution of expenditures is heavily skewed toward transit improvements. The following table summarizes the propose expenditures by mode. It shows that 57 percent of the expenditures planned for the region focuses on less than 3 percent of travel: transit service and expansion.

Table II.B.2.4: Summary of TIP and LRP Expenditures, Charlotte MPO

Category		Amount	Pct of total
Highways+Other	Capital	3.652	33.1
	Operating/Maint	1.047	9.5
	Total	\$ 4.699	42.5
Transit	Capital	2.494	22.6
	Operating/Maint	3.852	34.9
	Total	\$ 6.346	57.5
Total		\$ 11.045	100.0

A number of major road projects have also been completed in recent years, including the widening of I 77 from I 85 north (I-3311), opening of I 485 west of Charlotte (R-0211), opening of I 485 east of Charlotte (R-2123), and widening of NC 49 west of Charlotte to the Catawba River (U-2512).

The TIP itself is a tabular document that does not directly discuss congestion or other issues. However, a number of the projects on the TIP are likely to have congestion-reducing impacts. Among the major projects are the following:

Table II.B.2.5: Major Projects on the Charlotte TIP

ID	Route	From	To	Action	Est. Cost. \$M
R-2448	I 485	I 77	I 85 N	New 6L frwy	\$ 641.4
I-4750	I 77	NC 73	I 40	Widen to 6L	525.8
U-3321	Garden Pkwy	I 85	NC 160	New frwy (toll?)	448.2
R-3329	Monroe Byp	I 485	US 74	New frwy	204.6
I 3803	I 85	NC 29/49	NC 73	Add lanes	194.0
R-2559	Monroe Byp	I 485	Conn	New frwy	193.8

¹⁰ MUMPO 2025 Transit Plan, 2003.

¹¹ Mecklenburg Union Metropolitan Planning Organization, Transportation Improvement Program, 2006-12, May 2005.

¹² The transit component has been recently increased to about \$ 8.7 B. See TAP, Tech Appendix, p. 6-7.

U-0209B	US 74	NC 24/27	Idlewild	Upgrade to frwy + HOV	111.2
R-2706	NC 73	Lincoln Co	West Catawba	Widen	101.9
R-4902	I 485	US 521	I 77	Widen to 6L	38.0

The draft 2007-13 TIP¹³ also proposes to add several other major projects, including the widening of I 77 north from 485 to Sam Furr Road (I-3311), and the addition of an HOV lane from 5th St to I 85, but both are unfunded..

The long range plan is slightly more specific about congestion, but is not optimistic. There is no significant discussion of congestion in the document. The LRP goals do not mention congestion reduction or mitigation, focusing on, instead:

- A safe and efficient transportation system;
- Improved quality of life;
- Provide mobility choices;
- Sensitive to environment;
- Equitable transportation options for low-income and minorities;
- Meaningful public involvement.

The ‘Highway Plan’, within the LRP is similarly focused. Its goals are:

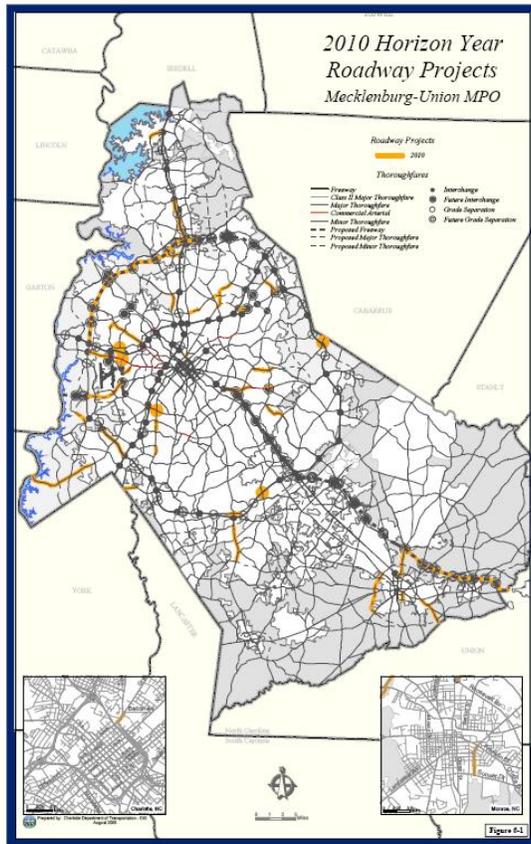
- Roads consistent with land use plans;
- Increase connectivity;
- Minimize travel time and distance for regional highways;
- Optimize capacity of major corridors;
- Ensure highways are available for other modes;
- Minimize incidents;
- Include bike and pedestrian concerns in highway design.

These goals generally focus on the process of planning and on the compatibility of highways, not on adequate capacity. While some might imply capacity improvements, other text (see below) says that widening will not be the central focus. There is no discussion of rising congestion or a forecast of its impacts.

The LRP does contain specific lists of highway projects identified for action in each of the 10-year periods between 2005 and 2030. For the period 2005-2010, the Plan identifies about 80 projects, of which 23 are ‘regionally significant’. Figure II.B.2.1 shows these projects.

¹³ MUMPO Draft TIP, 2007-13, fall 2006.

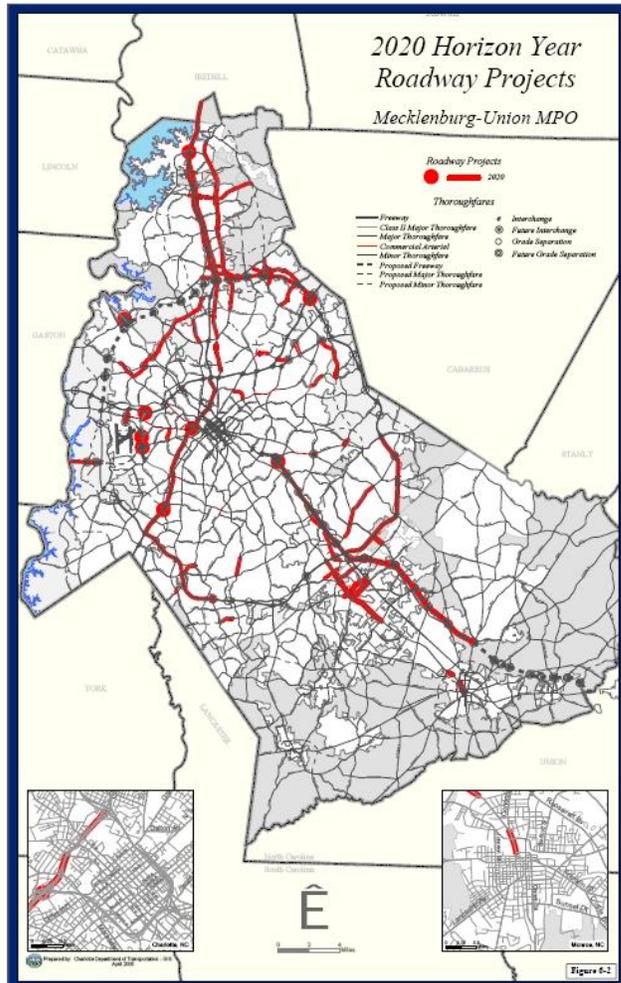
Figure II.B.2.1: Projects 2006-2010, Charlotte LRP



The major projects mentioned for this immediate period are:

- Complete I 485 west of I 77 (presently under construction)
 - Widen I 77 north to Huntersville
 - Monroe Bypass
 - Widen NC 16 from I 485 to Rea Road
 - Widen US 601 from US 74 to Monroe Bypass (Monroe) For the period 2010-2020, the Plan identifies an additional 80 projects, of which the following are noted as regionally significant:
 - Convert US 74 from an arterial to an expressway, Idlewild to Mecklenburg County line
 - Complete HOV lane in US 74 (part of above)
 - Widen I 77 N and HOV lane
 - Widen I 77 S and extend HOV to I 485.
- Figure II.B.2.2 shows these projects.

Figure II.B.2.2: Projects 2010-2020, Charlotte LRP

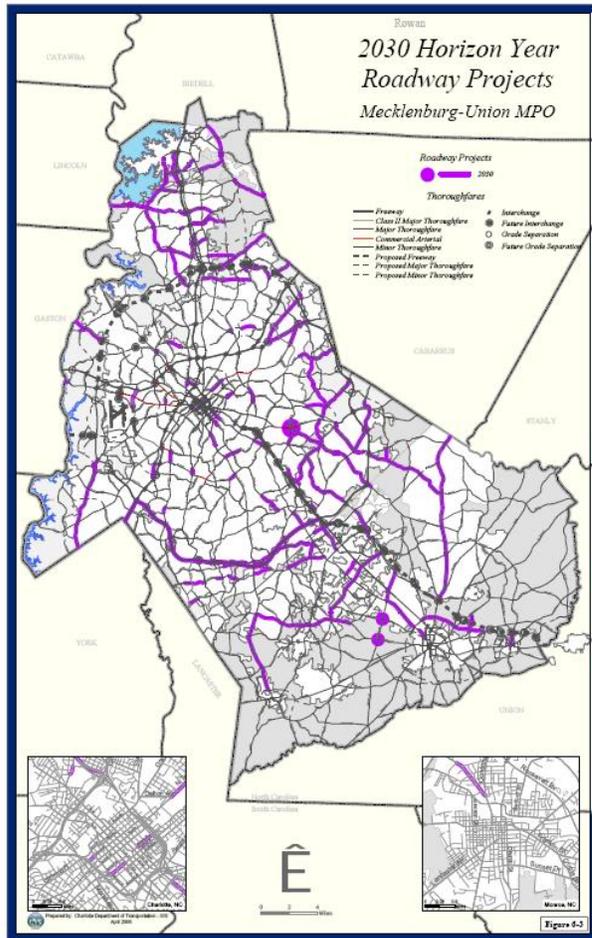


For the 2020-2030 period, the Plan identifies an additional 130 projects, the major ones mentioned being:

- Widen I 485 from I 77 to US 74
- Widen NC 73 from Huntersville to the Mecklenburg County line
- Widen US 601 from the Monroe Bypass to the Cabarrus County line
- Widen NC 16 between Weddington and Waxhaw.

Figure II.B.2.3 shows these projects.

Figure II.B.2.3: Projects 2020-2030, Charlotte LRP



The LRP contains no discussion of the implications of its forecasts. It does not discuss the impacts of a near-doubling of employment and population on traffic or on the goals noted. Indeed, the document is surprisingly devoid of specifics: no data on VMT (our data came from other documents), the congestion situation now or in the future, the significant pressure on the rim of the development area, growth of in-commuting from surrounding counties, or the impact of the present plans on those trends. At the least, the impact of rising employment and population on traffic should be discussed. Further, there is no mention of numerous other strategies for other actions. Its premise is a resignation to worsening congestion:

“[the goal is to]...balance competing interests.... The underlying premise...is that it is not possible to build our way out of congestion by constructing more through lanes along every congested roadway”¹⁴.

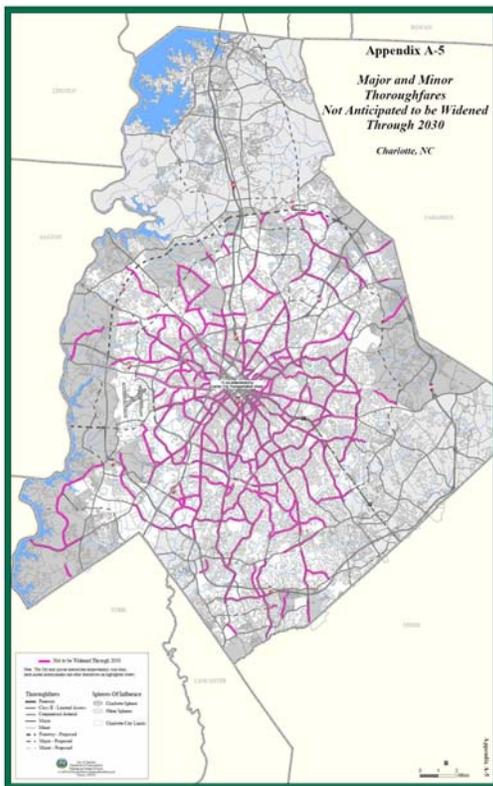
The section on ‘congestion management’ focuses exclusively on intersection treatments with some attention to a ‘high-capacity-list’ (HCL) identifying intersections with a volume-capacity ration greater than 0.95. But it is not specific as to what these should be. An additional focus of congestion management is traffic monitoring through surveillance

¹⁴ MUMPO LRP, p. 5-1.

and on incident management assistance. There is no discussion of capacity actions to reduce congestion, although location-specific solutions need not be addressed.

In addition to the TIP and LRP, the City of Charlotte has recently developed a ‘Transportation Action Plan’ (TAP) spelling out its intent to make the city “*the premier city in the country for integrating transportation and land use choices*”¹⁵. This document calls for stated percentages of development to be within the radial corridors specified by the earlier ‘centers and corridors’ plan, and for long-range plans to be consistent with the TAP. The estimated cost is \$3.6 B over 25 years. A key element is the adoption of a ‘Major and Minor Thoroughfares Not to be Widened Map’ (see Figure II.B.2.4), specifying a significant portion of the city’s arterials as off-limits for widening.

Figure II.B.2.4: Thoroughfares Not Widened 2006-2030



This document contains virtually no discussion of increasing congestion and its threat to quality of life; instead it focuses on provision of pedestrian, bike, and traffic calming actions. The document’s premise is that “*Many of the City’s streets cannot be further widened for automobiles without extraordinary cost and negative impacts on existing land uses and neighborhoods*”. This statement misunderstands the nature of arterial congestion (caused primarily by intersections). It unrealistically calls for reducing VMT per capita as the key strategy for relieving congestion, along with “strategic road widening”, development of pedestrian and bike facilities, enhanced transit, and greater connectivity in the street system. However, the study misinterprets the lower VMT/capita

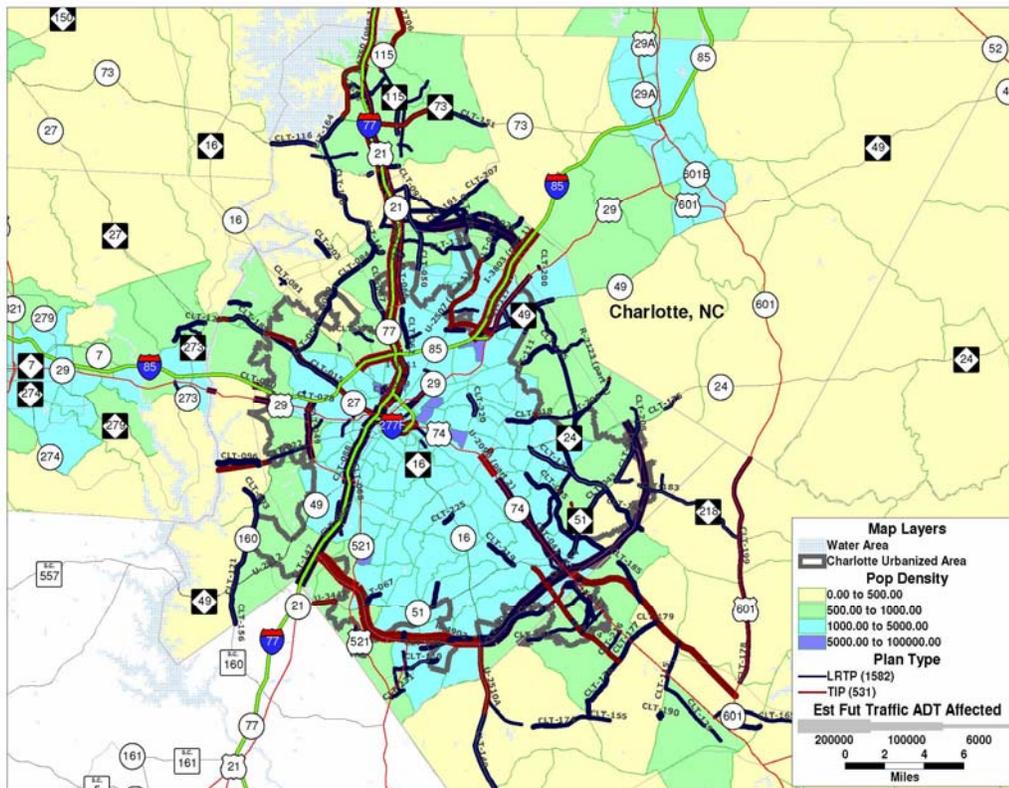
¹⁵ Charlotte DOT, Transportation Action Plan, 600 E. Fourth Street, Charlotte NC 2006.

inside NC 4 within Charlotte, attributing it to higher density when in fact it is largely an income effect¹⁶. The technical appendix to the TAP admits that *the percentage of streets at LOS E or F will increase from 29 percent to 60 percent by 2030, even with anticipated transportation improvements*¹⁷. But there is no discussion of how the actions presented might prevent that from happening, particularly since most of the city is already developed out. The TAP was adopted in principal by the City Council in the spring of 2006, but no action has been taken on sources of additional revenue needed to implement it. Its funding was recently deferred indefinitely¹⁸, putting the plan's congestion needs at even greater risk.

E. TIP and Long-Range Plan and VHT Savings

As we noted above, the Charlotte Long Range Plan is surprisingly devoid of specifics regarding the impact of its projects, and in particular their congestion impacts. In a recent analysis for the Reason Foundation project, Charlotte participated by identifying the impact of planned projects on congestion, and preparing a map showing that the region would be MORE congested after the Plan was completed than it is now¹⁹.

Figure II.B.2.6: Projects Affecting Congestion, Charlotte TIP and LRP



¹⁶ Lower income areas typically have fewer cars/capita and less VMT/capita.

¹⁷ Charlotte Dot, Transportation Action Plan, Technical Appendix, draft of Feb. 18, 2006. p. 4-2.

¹⁸ Charlotte Observer, March 6, 2007.

¹⁹ CDOT, Presentation on future congestion to the City Council, November 2005.

To determine the effect of the TIP and LRP on congestion, we followed the procedure described in the methodology discussion. All major projects in the TIP and LRP were identified and their congestion impacts estimated based on forecast traffic volumes and increases in speed. Appendix 3 contains a complete listing of the projects and their impacts. The above figure shows the major projects in the region that are likely to affect congestion.

The results are shown in Table II.B.2.6. In total, the TIP and LRP identify about 247 projects that are likely to reduce congestion. If implemented, these would cost about \$4.2 B over 25 years, and save about 52,565 hours of delay daily. As noted above, this is only about 35 percent of the 149,743 hours we estimated would be needed to hold congestion near its current levels.

Table II.B.2.6: Potential Savings in Delay from the Charlotte TIP and LRP

	TIP	LRP	Total
Number of Projects	33	214	247
Lane-Miles Added	202.4	837.8	1040.2
Total Cost, M\$	1079.4	3108.8	4188.2
Estimated Commuter DVHT Saved	19260	33305	52565

The following table shows the project mix by type. Of the 52,565 hours of potential savings, about 55 percent come from freeway widenings and urban arterial widening. Smaller amounts come from other project types.

Table II.B.2.7: Potential Savings in Delay by Project Type, Daily VHT

Work Type	TIP	LRP	Total
01-New Frwy	1450	1809	3259
02-New Arterial	151	2295	2446
03-New Exit/Ramp	0	77	77
04-Frwy Widening	4436	6185	10621
05-Urban Arterial Widening	4551	13978	18529
06-Rural Arterial Widening	565	3940	4506
07-Intersection Improvements	160	766	926
08-Signal Optimization	7737	0	7737
09-HOV/HOT Lanes	0	3122	3122
10-Bridge	8	21	28
11-Arterial to Frwy Upgrade	204	1037	1241
12-Minor Improvements, No Widen	0	73	73
Grand Total	19260	33305	52565

Our findings agree with the recent CDOT analysis which showed that congestion will be significantly WORSE after the Plan is completed. *In short, the Charlotte region is ensuring worsening congestion by focusing its scarce transportation dollars on projects that do not relieve congestion. It is guaranteeing a more congested future.*

F. Recommendations

The above review reveals a long range plan and philosophy that is strangely disconnected from the needs of the region. As citizens struggle to commute in increasing congestion, the Plan's focus is not on congestion relief – arguably the number one transportation issue in the region – but on ‘balance’ and ‘modal choices’ that all agree will have no effect on congestion. This situation will evolve in one of two ways: either the region will continue down its current path towards more congestion and less competitiveness while other regions prosper, or it will reverse course and undertake actions to get ahead of the problem. While there is some evidence (see below) that the region has at least recognized the seriousness of its predicament, recognition has not yet been reflected in actions. More needs to be done to bring this issue to the fore and to confront it. Among the actions we recommend are the following:

Capacity Provision and Management

- **Immediately re-think the LRP, TIP and TAP.** Rising congestion and its implications for reliable and reasonable travel times is by far the greatest threat to the Charlotte transportation system's performance, yet the TIP, LRP and TAP all ignore it. By the Plan's and TAP'S own assessment, severe congestion (LOS E and F) will be pervasive on 60 percent of the street system by 2030, even with the planned improvements. There is no possibility that the actions suggested by the TAP can provide nearly enough capacity to serve a projected 80-90 percent increase in traffic.

By avoiding this central issue, the urbanized area is guaranteeing declining system performance and a weakening economic competitiveness, and prescribing a future in which people can't get to jobs or shopping, employers can't find workers, and commerce can't attract customers. Responsible agencies have failed to even study the problem, let alone figure out how to deal with it. The region's businesses and human interest leaders should insist that their elected officials and appointees immediately re-think their transportation plans with reduction of congestion in mind. Atlanta has recently re-thought its long range plan and has set a goal of REDUCING congestion, from a TTI of 1.45 to 1.35; the TIP project selection process has been changed to put 70 percent of weight on congestion. Charlotte should take similar bold action.

- **Re-think the role of transit.** Perhaps the greatest structural weakness in the Charlotte plan is its focus of 57 percent of available funds on transit expansions which, even if they produce the predicted four-fold increase in usage, will have no measurable effect on regional travel or on congestion. But the 5-corridor initiative is weakening under greater federal scrutiny, lower demand numbers, and rising costs. Already the north line has been judged unlikely to receive federal funds, based on low ridership and higher costs; a similar fate is possible for the northeast corridor, which has modest ridership forecasts and costs approaching \$700 M, *before* design. The wind has shifted in Washington and Raleigh on funding too: Raleigh's own light rail proposal has been shelved and the region has embarked on a reassessment of transit's role, and in DC earmarks have been struck down and cost-effectiveness criteria tightened. These trends bode ominously for additional LRT lines anywhere in North Carolina in the foreseeable future.

The Charlotte region should take this opportunity to re-size its transit plans, re-evaluating the need for expensive light-rail services, and focusing instead on express-bus

services along with beefed up transit service within the city core and provision of more user-friendly private vehicle-based service for transit dependent persons. Some of the dollars saved (local match dollars) should be dedicated to projects that demonstrably relieve congestion. If the Plan were revised to provide about \$ 8 B to highway projects rather than the \$ 4 Billion presently, then the region would have the resources to significantly attack its rising congestion problems.

- **Expand the role of added capacity in the revised plans.** The following table suggests an allocation of an additional \$ 4 B spent on capacity-reducing projects. In total, the result would be an additional 64,000 hours of delay saved, getting the MPO 2/3 of the way to the 150,000 goal. The unit cost, about \$12.12 per hour saved, is less than ½ the cost of an hour of travel time saved on the South Blvd. transit line.

Table II.B.2.8: A Suggested Allocation for \$ 4 B more for Highways, Charlotte MPO

Focus	Note	Additional Amount Suggested (above LRP)	Unit Cost, \$M/lane-mile*	Total Cost, \$M	Ave Cost per Delay Hour Saved*	Est. Delay Hours Saved, Daily**
Freeway Widening	Selected lane additions	100 lane-miles	\$ 5.5	\$ 550	15.0	7333
Art to Frwy Upgrade	Inner circumferential road upgrades	50 lane-miles	\$ 11.0	\$ 550	30.0	3666
Frwy Int Upgrades	Single-point urban diamonds and flyovers	20 locations	\$ 15.0	\$ 300	100.0	600
Bottleneck removal	Lane additions, 15 locations	50 lane-miles	\$ 7.0	\$ 350	15	4666
Intersection treatments	Primarily left turn capacity	200 intersections	\$ 5.0	\$ 1000	30	6666
Arterial widenings	Selected lanes added	200 lane-miles	\$ 3.6	\$ 720	10	14440
Signal Optim	City –wide coordination	300 intersections	\$ 0.2	\$ 60	0.5	24000
HOT lanes	Lanes on selected radials	50 lane-miles	\$ 8.0	\$ 400	23	3478
				\$ 3930	\$ 12.12	64849

*Based on averages for the Charlotte region. See Appendix 3.

** (tot cost/ave cost)/20 years/250 commute day

We are NOT calling for additional funding. We believe that the \$ 4 B suggested above can be found WITHIN the current TIP and LRP/TAP plans, by re-allocating funds presently committed for transit capital and operating actions, deleting major cost-ineffective projects, and re-allocating current highway funding to more effective projects.

- **Identify and act on major current bottlenecks.** The region presently has a number of locations that regularly experience recurrent volume-based congestion. The primary locations are:

- I 485, between I-77 and Rea Road.
- US 74, between the Union County line and uptown Charlotte.
- I 85/I 485 interchange in NE Charlotte.
- The I 85 S-I 77 S interchange, where a one-lane ramp backs up traffic onto I 85 regularly.
- I 77, northbound at future I 485, where 4 lanes presently merge into 2.
- I 77, south of I 277 Loop to the South Carolina state line. This 6-lane section is the closest to capacity in the region and is regularly overloaded.
- I 85, west at Belmont Abby where 4 lanes merge into 3.
- Harris Blvd, an urban arterial in NE Charlotte;
- Providence Rd, south of NC 51.
- Ballantyne area
- University area
- The CBD, where one-lane ramps back up traffic inbound and outbound.

These are not all the bottlenecks in the city, just examples of those that regularly experience problems. Yet, most of these have no immediate fixes in sight, and several are beyond the TIP in scheduling or have inappropriate proposals. The MPO needs to conduct a ‘bottleneck study’ to locate all such points and identify cost-effective ways to handle them. Often the solution is quite limited in scope and within the right-of-way, limiting environmental concerns. It is frustrating to citizens that these regularly occurring congestion points are not being addressed or are scheduled 10-20 years out in terms of a fix.

- **Quantify the impacts of current plans on congestion.** The region’s plans do not go far enough in project assessment: if the projects are effective congestion-reducers then the numbers that show that should be provided. The region should use its travel demand model to quantify the congestion-reducing impact of each major project. Results should then be presented and used to develop revised plans.
- **Move up projects that reduce congestion.** The weight provided to congestion (5 points out of 55) in the TAP and in the development of the TIP and LRP is too low to bring congestion-reducing projects into the mix. The MPO should follow the lead of Atlanta, which recently changed its scoring so that 70 percent of weight is given to reduction of congestion.
- **Develop a plan for an intra-regional ring system.** Within the inner areas of the city, there is considerable difficulty in making cross-town movements. The city needs to improve cross-town circumferential access by upgrading the flow of the major cross-town routes of Eastway-Wendover-Billy Graham, Sharon Amity-Harris, and NC 51. We are not suggesting a freeway system for these routes, but simply upgraded corridors with better signal synchronization and intersection treatments.
- **Investigate creative highway design for intersections and freeways.** The MPO and city have been too quick to dismiss the possibility of capacity expansion. New design techniques, new intersection treatments, covered and elevated sections, and sound

'tunnels' all provide means of substantially increasing capacity of intersections and some links without taking additional land. Peter Samuel²⁰ has recently summarized these approaches and finds them applicable to a much wider range of situations than previously thought. Tampa has recently built an elevated 3-lane reversible section above an existing freeway, essentially doubling the capacity without additional land; I 77 between the CBD and the SC state line could be widened within the current right-of-way using these approaches. Some work in this direction has begun: the City of Charlotte has implemented some of these ideas using creative intersection design to re-build intersections with both capacity improvements and pedestrian amenities²¹. However, the actions taken so far focus primarily on pedestrian protection rather than capacity increases. They need to be expanded and applied to a much larger number of facilities. Applications might include the narrow section of I 485 and the widening of I 77.

- **Identify other major projects for widening:** It is insufficient to limit the future widening needs to a few state-owned corridors. The MPO and city need to take another look at the TAP and identify other arterials that are likely to need widening in the future. Placing $\frac{3}{4}$ of the city's arterial system 'off limits' for widening may be good short-term politics, but it is terrible long-term transportation planning. This portion of the TAP should be rescinded.
- **Reassess the need for the Monroe Bypass and the Garden Parkway.** These projects, while 'nice to have', have not been demonstrated to reduce congestion, and their costs are increasing. Both have been recently suggested for partial toll-road financing, but tolls are not likely to cover the costs of each project. An objective assessment should be made concerning what these projects actually do for the regional transportation system – in quantitative terms – and if the benefits are too low, they should be dropped.
- **Change the DOT highway funding formula.** Many groups have commented over the years that the formulas used to distribute highway funds shortchange larger regions with significant congestion needs. Several initiatives to review the formula are underway. In the Charlotte region, several groups led by NC GO²² are pressing to revise old formulas so that congestion is given more attention. The region needs to work with other MPOs and state elected officials to get these formulas changed, or at least add components for higher-level road needs or congestion needs.
- **Develop a serious congestion reduction plan.** There is some evidence that the region is beginning to understand the importance of the congestion issue. The MPO has recently initiated a \$500,000 study to identify congestion needs and to determine which roads are the best candidates for tolls or congestion management treatment²³. However, the study does not go far enough in reviewing the capacity needs of the urban area. It should

²⁰ Samuel, P, op. cit.

²¹ Rubin R, "Some relief at Woodlawn and South" Charlotte Observer, January 2, 2007.

²² Mildenberg, D., "Groups push new strategies for relieving congestion", Charlotte Business Journal, December 29, 2006.

²³ Mildenberg, D., "Traffic finally on Agenda? \$500,000 to study roads". Charlotte Business Journal, November 24, 2006.

review all road needs in the region and identify those that need widening, without regard to arbitrary 'off-limits' signs.

- **Pay more attention to intersection turns.** One positive aspect of the TAP is its attention to intersections. The TAP proposes to spend \$400 M over 25 years to upgrade 100 intersections for capacity enhancements. While this is a step in the right direction, it is too little. The TAP'S intersection program should be expanded to at least 400 intersections at an estimated cost of \$ 1.6 B. Concomitantly the present HCL (high-capacity-list) listing for priorities is too vague: it should focus not on full intersection capacity but on each turn separately, and give at least 50% of weight to congestion relief.

Demand Management

- **Implement a serious flex-time and staggered work hours program.** Virtually every city in the US has a flex-time program as part of its congestion management plan – Charlotte does not even mention it. These programs can be very effective in spreading traffic loads around work sites and activity centers. Given the high concentration of local employment in a few large employers, administrative action regarding the programs should be easier to implement. The MPO needs to add this component to its congestion management strategy.
- **Expand work-at-home and telecommuting programs.** Work-at-home is the most rapidly growing form of 'commuting' nationwide and in Charlotte. During the 1990's work-at-home increased 103 percent in Mecklenburg County, while the use of public transit/taxi declined 5.7 percent. Work-at-home 'commuting' is now 50% larger than transit commuting. Yet this increase took place with virtually no assistance from government. The Charlotte LRP contains no mention of it. Most cities of this size as well as many smaller ones have work-at-home encouragement programs as part of their congestion reduction strategy. Not only is the strategy cost-effective, but it is largely untapped. The MPO should move aggressively to add this component to its congestion management strategy.
- **Expand carpool program and vanpool programs from the residential end.** As noted above, carpooling is highest not in urban counties (where trips are shorter and carpooling arrangements not worth the effort) but in distant 3rd tier counties that need access to urban jobs at a reasonable commuting price. CATS' present vanpool program, with about 76 vans, carries just 500 commuters, less than 2 percent of area carpoolers, and its upside is limited because carpooling is a transitory behavior that has considerable turnover. Therefore, programs that focus on local employers and within-county commuters are likely to fail or deteriorate over time. A better approach is to work with distant communities, outside the MPO boundary, to offer commuting services on a long-distance scale, from the residence end. This requires changing the 'business model' now used by CATS and other agencies offering carpooling services.
- **Add HOT lanes now to I-77 south and north. Drop or convert wasteful HOV lanes on Independence and I 77.** The region's initial HOV lanes have been highly visible

failures, falling far short of industry standards for operation²⁴. They cannot succeed as now structured because the demand is too low in these corridor, and both corridors have recently been widened destroying their time advantage. They should be converted to high-occupancy-toll (HOT) lanes which permit solo drivers to use them for a price during peak hours, and opened up for all drivers during off-peak hours. But HOT lanes or extra tolls will not solve most congestion problems. Toll are only applicable in situations limited to freeway widening and funding for extra lanes, usually on major freeways and new facilities or expansions, and even in those cases they usually do not come even close to funding the project. And the use of tolls can also artificially speed up selected projects to the detriment of other needs²⁵. The vast needs for the city are not that, but instead for more arterial widening and intersection treatments.

- **Expand regional express bus service.** Compared with other cities Charlotte is certainly large enough for an extensive cross-regional express bus service. Although some service now exists between some nearby cities, little exists out to the second ring of cities. Given the growth at the edge of the region, this service should be coordinated with vanpool service and expanded regularly as justified.

Planning and Administration

- **Use the regional model to select projects.** More use needs to be made of the recently developed regional model. This new tool covers a region much larger than the MPO area, and is available for use by other nearby MPOs as well. However the model's use so far has been limited to showing congestion in surrounding counties and some congestion analysis for Charlotte. It needs to be used more for evaluating individual projects, for peak-hour modeling, for HOV and HOT lane analysis, for freight analysis, for transit corridor planning, and for toll pricing analysis. In particular, the 2000 survey update should be added in, and the 2000 external survey, so that a full up-to-date picture of regional travel can be obtained and forecasted. It was the failure of the region's prior model to accurately forecast in-commuting and edge-of-county growth that led directly to the under-design of I 485 in southeast Charlotte; a similar event should not be allowed to occur again.
- **Revise the HCL list based on congestion.** The city's high-capacity-location list of intersections should be re-prioritized based on congestion, not on qualitative measures that result in all intersections being important and on less attention to congestion.
- **Select projects based on congestion reduction.** Projects being considered for the TIP and LRP should be evaluated based on their congestion-reduction potential, as estimated from the regional model or from shorthand approaches such as used in this study.
- **Implement a congestion monitoring program and update regularly.** The region's congestion monitoring program is too data-intensive and does not 'roll up' the data in a

²⁴ Industry criteria for HOV lanes call for 800-1200 peak-vehicles per lane per hour; Charlotte's I 77 HOV lanes carry about 300 peak-hour vehicles per lane.

²⁵ Lowrey M., Tolls won't fix poor policy. Carolina Journal, January 2007.

way that citizens or officials can easily understand. We suggest that the TTI data be used as the basis of a more formal rating system which can be tracked annually.

- **Coordinate major commercial development at major interchanges.** The TAP specifically calls for the use of the city's Interchange Development Plan as the guide for developing each of the Outer Belt's 32 exits. We believe that some coordination, but not necessarily stringent agreement, should be permitted between the two. This is because circumstances change and the private sector should not be frozen into building only what was approved years ago. On the other hand some agreement should be insisted on to ensure the capability of roads to carry loads. One approach might be to allow development to vary, in terms of estimated trip ends, by 20% from plan constrictions.
- **Coordinate project selection with Concord, Gastonia, and SC MPOs on major projects.** Since congestion is a cross-regional problem caused by cross-regional travel and connectivity, it cannot be addressed solely within the geography of just one MPO area. We do not believe that the greater Charlotte region needs just one MPO, since we believe that planning is best done locally. Nevertheless, there needs to be better coordination – not just model-building - between the region's MPOs for major inter-regional projects. Examples would include I 485, I 77, I 85 and other similar facilities. The region as a whole, perhaps through CRAFT, needs to move beyond modeling coordination to cooperative (but not mandatory) project selection and funding.

