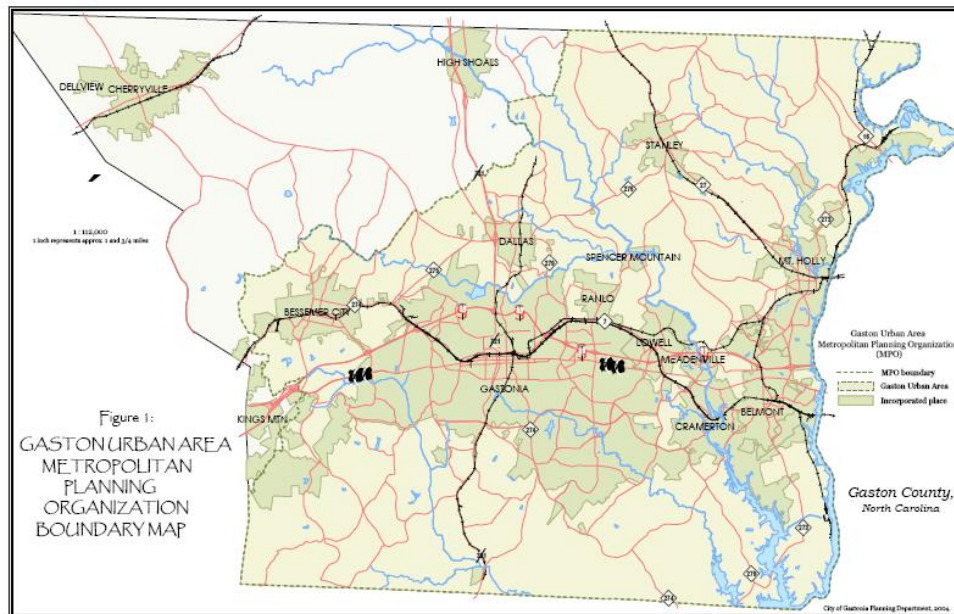


4. Gastonia

A. Regional trends

The Gastonia metropolitan area is situated just west of the Charlotte region, on which it borders. Gastonia is within easy commuting distance of most of Charlotte and is part of the greater Charlotte commuting shed. The two regions are separated by the Catawba River, but the city centers are only about 23 miles apart. The MPO planning area includes the entire county (Figure II.B.4.1) with the immediate planning area consisting of the southeast 2/3 of the county. It includes Gastonia and several nearby communities (including Belmont, Cramerton, McAdenville, Ranlo, Mt. Holly, Kings Mountain, Bessemer City, and Stanley)¹. The MPO area contains about 88 percent of the County population.

Figure II.B.4.1: Gaston Urban Area MPO Planning Boundary



Partially as result of limited access (only 2 river crossings, I 85 and US 74, provide direct connection) but more because of different community structures, the two regions have experienced quite different growth paths. Historically, Gastonia's economy is manufacturing-based and textile-dependent. With the downturn of manufacturing and textile jobs and no other major industry emerging, recent growth in the region has been muted. While the Charlotte region has grown rapidly over the past 2 decades, the Gastonia region has experienced much slower growth – particularly for a suburban community of a large rapidly growing city. The population of Gaston County grew just 8.7 percent in the 1990s, the slowest growth of counties in the greater Charlotte region.

However, the future holds a more optimistic path. As the greater Charlotte region expands more attention has been recently paid to housing expansion in Gaston County, both in the traditional textile-based towns and in suburban locations. The recent widening of I 85 has reduced travel times to downtown Charlotte and (along with taxes, crime and

¹ GUAMPO LRP, p. 1.

school issues) has increased the attractiveness of Gaston County housing². Connections to rapidly-growing York County (in adjacent South Carolina) are also improving, and completion of US 321 north to Hickory has increased access to the mountains. Proposals for a new river crossing (the Gaston Parkway) connecting the Charlotte-Douglas International Airport directly to relatively isolated southern Gaston County and I 85 west of Gastonia would also significantly change the accessibility of rural areas of the County.

The following table shows projections of basic information for the Gastonia region. The data are based on statistics provided by the MPO³, and by the state to FHWA. This data forecasts an approximately 50-60 percent increase in population over the next 25 years, almost 3 times the growth rate of the 1990s. Interestingly, the MPO forecast is for more population growth relative to employment growth, implying greater out-commuting to other areas, presumably Charlotte⁴. The VMT is also expected to increase significantly, driven partially by increased commuting but also by increasing local shopping from other counties⁵. In short, many see Gaston County as likely to see explosive Charlotte-driven residential growth in the next several decades and potentially stronger employment growth too.

Table II.B.4.1: Regional Trends, Gaston Urbanized Area

Gastonia	MPO Data				FHWA Data		
Base Year	2002	2030	Pct Ch		2003	2030	Pct Ch
Population	191,312	292,063	52.7		135000	221000	63.7
Employment	70,801	96,753	36.7				
VMT (Thousands)	4,682				4,872	7,976	63.7
Net Size	870				889	1,469	65.2
% Congested/ Miles Congested					2.5	2.12	-16.5
Transit Work Share	0.3				0.3		

B. Commuter characteristics

The commuting patterns of the region are typical of North Carolina's urban areas. Table II.B.4.2 summarizes the characteristics of Gaston County resident commuters (workers age 16+) for 1990 and 2000. About 6.7 percent of county households are 0-vehicle, down sharply from 1990. About 83.7 percent of commuters drive alone to work, up sharply from 1990. Carpooling, transit/taxi, and bike/walk shares have all dropped as well, but work-at-home 'commuting' has increased sharply and is now 5 times larger than transit/taxi share. Mean commute travel times, about 24.6 minutes, are up.

Table II.B.4.2: Gaston County Profile of Resident Commuters

	1990	%	2000	%	Pct Change
Population	175,093	100.0	190,365	100.0	8.7

² GUAMPO LRP, p. 37.

³ Gaston Urban Area Metropolitan Planning Organization, 2030 Long Range Transportation Plan, May 25, 2005.

⁴ Ibid., p. 13.

⁵ Ibid., p. 37.

	1990	%	2000	%	Pct Change
Households	65,194	100.0	72,836	100.0	13.3
0-Vehicle	6,062	9.3	4925	6.7	-18.8
Workers 16+	87681	100.0	89,341	100.0	1.9
Drove Alone	70,119	80.0	74,796	83.7	6.7
Carpooled	13,243	15.1	11,338	12.7	-14.4
Public Trans and Taxi	355	0.4	228	0.3	-35.8
Bike/walk	2,088	2.4	965	1.1	-53.8
Motorcycle/other	844	1.0	580	0.6	-31.3
Work at home	1,032	1.2	1,434	1.6	39.0
Mean travel time	19.7		24.6		
Drove alone			24.4		
Carpooled			26.8		
Public Trans and Taxi			36.1		
Bike/walk			9.7		
Motorcycle/other			32.0		
Work at home					
Working in Gaston Co					
Total workers			75,015		
0-car hh			2155		
Bus or trolley			280		
0-car hh			45		

In summary, the Gaston County statistics suggest a region on the cusp of change, reporting slow growth in the recent past but likely to experience ‘spill-over’ growth from the Charlotte region and already rapidly becoming more auto-dependent. If the changes noted above come to pass, these characteristics are likely to accelerate.

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

The Gastonia urbanized area is not one of the cities tracked by the annual TTI survey of congestion. Therefore, we used the recent Reason Foundation study⁶ to develop an estimate. The following table summarizes our forecast of congestion for the greater Gastonia urbanized area. The region is experiencing moderate congestion now, with an estimated TTI (travel time index) of 1.04. This means that travel times in the peak hour are about 4 percent longer than in the off-peak. The region’s commuters now spend about 39,207 hours daily in commuting. However, as the region grows, both the number of commuters and the congestion will increase. The combined effect will be an increase in commuting hours to 67,074, or about 71 percent, a very substantial increase indeed. Of the increase, about 23845 hours will be due to the growth in commuters, and 4022 hours will be due to increased congestion.

⁶ Hartgen and Fields, op. cit.

Table II.B.4.3: Projected Increases in Commuting Delay, Gastonia UA

Item	Gastonia Urbanized Area			
	1995	2003	2030	Change 2003-30
Population	118000	135000	221000	86000
Commuters		65489	107034	41545
TTI	1.03	1.04	1.09	0.05
Mean Travel Time		17.96	18.80	0.84
Free Flow Travel T		17.22	17.22	-
Free Flow DVHT		37588	61433	23845
Delay DVHT		1619	5641	4022
Total DVHT		39207	67074	27867
Ave Hrs Del/yr		6.2	13.2	7.0

Congestion delay in the Gastonia region will increase 2½ -fold in the next 25 years. To say it another way, if local planners wanted to hold congestion to current levels, they would have to take actions that, in total, save about 4022 hours of commuter delay daily. As we note below, this is achievable with focus.

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

The Gaston TIP and LRP together propose to spend about \$ 934.3 M over 25 years for roadway improvements in the region (the Plan does not contain a ‘maintenance’ estimate), against a revenue estimate of about \$1082.6 M⁷. The following table summarizes the expenditures:

Table II.B.4.4: Gaston MPO Proposed Highway Capital Expenditures

Years	Amount	Major Projects
2005-10	\$ 21.6	NC 274 widening
		NC 16 new alignment
2011-20	\$ 46.9	Linwood Road widening
		New Hope Rd widening
		Belmont N. Loop
	\$ 661.0	Garden Pkwy (U-3321)
		Union Rd widening
2021-30	\$ 204.8	Gastonia-Mt Holly Connector
		Lowell, Catawba bridge
Total	\$ 934.3	
Transit capital needs	\$ 95.4	

⁷ GUAMPO LRP, p. 110 ff.

However, the stability of the revenue forecast is based on the above 3 assumptions, all of which seem unlikely⁸. Transit needs are estimated to require an additional \$ 95.4 M.

The LRP does not specifically discuss congestion in any detail. In its listing of 5 goals, congestion reduction is not mentioned, but is obliquely referred to in providing a “safe and efficient system... [providing for] movement of people and goods.”⁹ In the ‘objectives’ section, reference is made to increased connectivity (river crossings), and “optimizing capacities” and “minimize travel times”.

In the discussion of several individual projects, the need for congestion reduction is mentioned, but supporting data (present or future volumes versus present capacity) is generally missing. The Gaston Parkway, the major project planned for the region, is envisioned as a 4-lane freeway connector extending from I 85 west of Kings Mountain south around Gastonia, then connecting to I 485 at NC 160 near the Charlotte airport. An additional section would go north from I 85 to US 321 north of Gastonia. This project is described as a “bypass for I 85 and US 321”, and later, “the # 1 project to relieve congestion”, but that is clearly not the case since most Gaston-generated I 85 traffic originates east of the proposed parkway connection with I 85, and most US 321 traffic is headed east or into central Gastonia, not south around the region. Another statement, “I 85 cannot be widened further due to development¹⁰” is also open to question given innovations in highway design, and the availability of right-of-way along all of I 85. This single project, at \$ 700 M (recently \$ 1B+) is over half the entire LRP budget. Proposed funding is through tolls, combined with state ‘Loop’ funds and federal funds, but the recent cost jumps and the federal back-off from earmarks increase its risk.

The LRP also contains fairly detailed location assessments for 29 major projects, most of which are widenings, extensions or small loops. The top 7 projects in priority order are:

Priority	Section	Cost (\$M)
1.	Garden Parkway, U-3321	450
2.	Garden Parkway, R-2608	250
3.	New Hope Road widening	12.4
4.	Franklin Blvd, westbound, widening	2
5.	Union Road, widening/realign	13
6.	York Road, widening	1.7
7.	South New Hope Rd, widening	13

However, the details for these projects show no traffic forecasts (nor many current estimates), so present or future V/C ratios are not available. The thoroughfare plan and the LRP projects are shown in the following figures.

The LRP does detail its project selection criteria¹¹. In it, ‘congestion’ is one of 9 criteria, and is typically assigned 15-20 points depending on current V/C ratio. However, out of the total score, typically 70-80, congestion typically accounts for less than 20

⁸ A change in the federal formula for NC, no more transfers from the Trust Fund, and a change in the NC highway equity formulas. Source: LRP, p. 110.

⁹ GUAMPO LRP, p. 7.

¹⁰ Ibid., p. 71.

¹¹ Ibid. p. 76.

percent. Congestion REDUCTION versus cost, a measure of project cost effectiveness, is not considered.

Figure II.B.4.2: Gaston Thoroughfare Plan

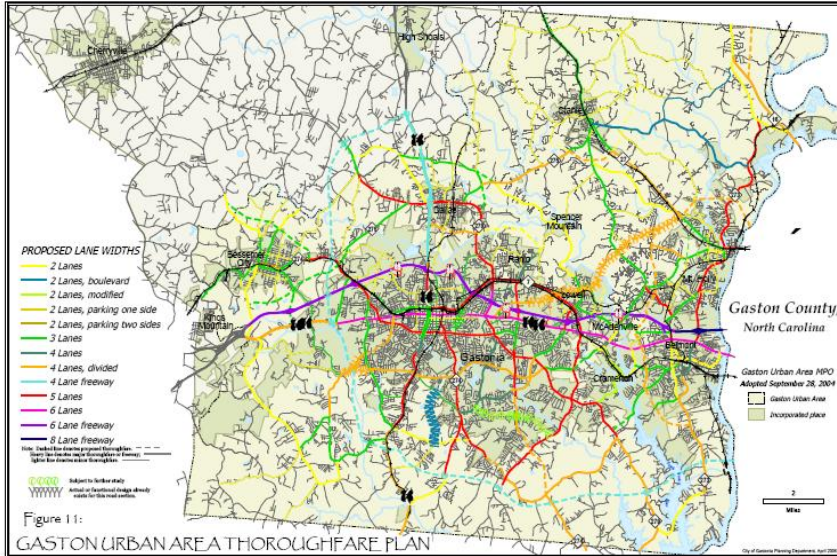
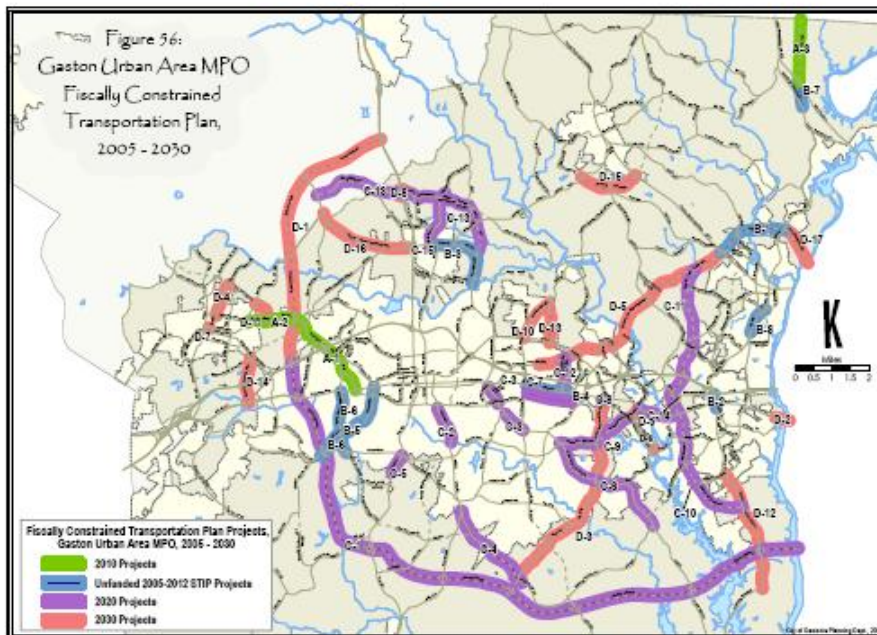


Figure II.B.4.3: Gaston LRP Projects



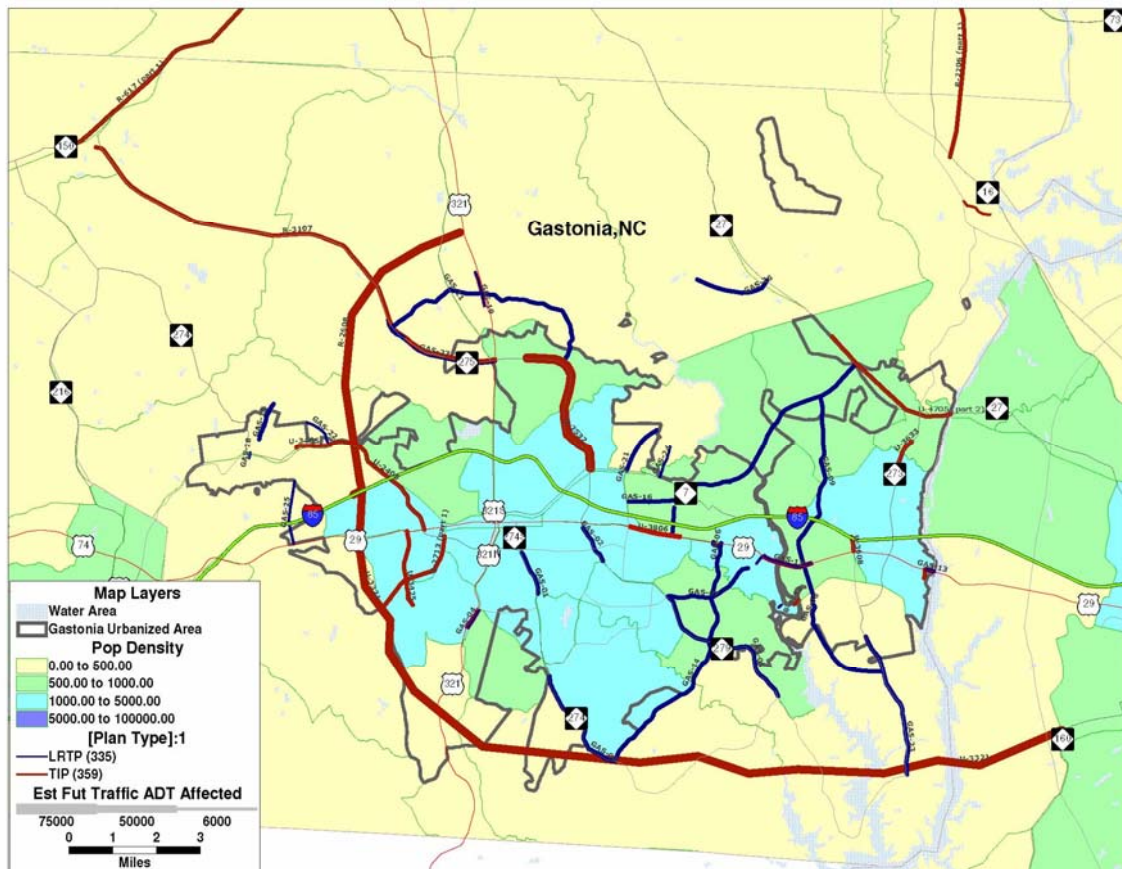
The LRP also extensively discusses the situation with the region's declining transit use, but does not seem to recognize the realities of ridership as it hopes for a

‘turnaround’, a highly unlikely event¹². The discussion of express bus or rail service to Charlotte is equally over-optimistic. Ridesharing is dealt with briefly¹³, noting that the regional flow to Charlotte is 16,500 daily but that the implied express bus departures (4) carry just 78 commuters daily, and the 15 sponsored vanpools carry at most 100 riders daily. Air quality is noted as a problem (the region is designated ‘non-attainment’ for the 8-hour ozone standard), but is improving as vehicles get cleaner. The Plan does not mention other demand-management actions such as flex-time scheduling.

E. TIP and LRP and VHT Savings

To estimate the potential reduction in congestion delay from the Gaston TIP and LRP, we followed the procedure described above for other areas. Each project on the TIP and LRP was carefully reviewed for potential to reduce congestion. Those projects found to do so were then located, and estimates of congestion reduction were made using estimated traffic volumes and savings in travel time. Appendix 3 provides a complete list of projects, which are also shown in the following figure.

Figure II.B.4.4: Projects Affecting Congestion, Gaston UA



¹² Ibid., p. 16.

¹³ Ibid., p. 20.

Table II.B.4.4 summarizes the results of this analysis. In total, the TIP and LRP contain about 48 projects that are likely to affect congestion in the region. If implemented, they would add about 443.5 lane-miles to the regional network, at a cost of about \$1.409 B. However, the projects would also significantly reduce congestion by saving about 7666 hours of driving delay daily. This is somewhat more than the 4022 hours of delay savings needed to hold congestion at current levels. Thus, if implemented on schedule and effective, the Gaston TIP and LRP stand a good chance of reducing congestion in the region.

Table II.B.4.4: Potential Savings in Delay from the Gastonia TIP and LRP

	TIP	LRP	Total
Number of projects	21	27	48
Lane-Miles added	281.6	161.9	443.5
Total Cost , \$M	\$1011.4	\$397.6	\$ 1409
Estimated Commuter DVHT saved	5216	2450	7666

The distribution of savings by type is shown in the following table. Most of the savings are in new freeways and urban arterial widening.

Table II.B.4.5: Potential Savings in Delay by Project Type

Work Type	TIP	LRP	Total
01-New Frwy	2671	0	2671
02-New Arterial	419	359	778
03-New Exit/Ramp	0	11	11
05-Urb Art Widening	1253	1884	3138
06-Rural Art Widening	452	156	609
08-Signal Optimization	414	0	414
10-Bridge	7	38	45
Total	5216	2450	7666

F. Recommendations

The Gaston LRP and TIP are descriptive and well organized documents that outline a transportation vision for the region’s future. The LRP enjoys the advantage of having a modest underlying growth rate and no major inefficient transit component. The plan also places considerable focus on arterial improvements. On the other hand, it relies extensively on unlikely revenue assumptions and places great weight on one project’s success. Other options to that project (the Garden Parkway) have not been fully examined, but may be necessary even if the project goes forward. The plan also contains no significant demand management components, fails to justify its projects, and places too little weight on rising congestion. The apparent lack of coordination with other MPOs and states is also a weakness.

Capacity Provision and Management

- **Review the reasonableness of revenue assumptions.** Given the recent changes in Washington (tightening of earmarks, flat budgets, fewer LRT starts, unlikely changes in national formulas) and Raleigh (no discussion of changes to state highway formulas, rising costs of projects, and limited use of tolling), it seems that the key assumptions underlying the region's forecast of revenue are questionable, to say the least. Given the federal requirement for fiscal reasonableness, the Plan's basic assumptions should be reviewed.
- **Place less emphasis on the Garden Parkway.** If traffic is going to increase 50% and congestion double, then projects that *demonstrably* reduce congestion should be the major focus of the Plan. The Garden Parkway, while 'nice to have' is justified primarily by increased access and development, not by congestion relief. The regional model should be used to answer hard questions about the parkway. Where and by how much will it relieve congestion? Do its benefits justify its cost? Would other alternatives (widening I-85, another bridge south of I 85 but north of the Parkway) be more effective? More than this, if the Parkway proves infeasible even with tolls, the region has no real 'fall-back' plan to deal with rising congestion.
- **Review the need for loops around smaller communities.** These projects are also 'nice to have' but would be largely unnecessary if sufficient capacity were provided on primary arterials. Once again, each project should be carefully assessed for its congestion reducing potential, not for its ability to open up land for development.
- **Re-consider the widening of I 85.** In a major oversight the present Plan does not mention I 85's problems or its importance to the region. I 85, not the Garden Parkway, is the region's future lifeline, tying it to jobs in Charlotte and points east. The possibility of widening I 85 has not been seriously reviewed. Room for 4 lanes each way is presently available through the entire corridor, and this action may be needed in any case to handle growing long-distance and truck traffic in the Atlanta-Washington corridor. The westbound 'squeeze' from 4 to 3 lanes at Belmont Abby is arguably the most dangerous site in the county, yet is not mentioned in the Plan. Innovative highway designs¹⁴ that allow for capacity improvements in tight spaces are increasingly common. Given that widening might be needed west of Gastonia and through the region, even if the Parkway is built, more attention should be placed on this option. Other options that should be looked at include reversible lanes and a westbound HOT lane.
- **Place more attention on signalization.** An important project, signal optimization for the regions 200+ traffic signals, should be moved up in priority. Most congestion in the region is at signals, and particularly at left-hand turns. The MPO needs to conduct a signal and intersection assessment and prioritize work based on that. Treatments at individual intersections, as well as at presently coordinated signals, should also be developed. In short, the region needs more attention on the basics of congestion and less on longer-range major projects.

¹⁴ Samuel, op.cit.

- **Prioritize arterial widenings.** The Plan’s focus on arterial widenings is appropriate, but the resulting work needs to be prioritized. Generally, urban arterials should not be considered for widening until their predicted (post-widening) traffic volumes exceed about 12,000 ADT.
- **Delay or eliminate some rural widenings.** Again, ‘nice to have’ but not essential. Studies for North Carolina¹⁵ have found that generally rural widenings are not cost-effective unless future (after widening) volumes exceed about 8,000 ADT.
- **Develop a bottleneck removal program.** A number of locations in the area are regular bottlenecks. These include, but are not limited to:
 - Franklin Blvd. near commercial areas
 - New Hope Road south of I 85
 - Cox Road between I 85 and Franklin Blvd.
 - I 85 westbound at Belmont Abby

The MPO needs to develop a specific ‘location map’ of existing and predicted congestion locations, and develop plans for dealing with them.

- **Develop an incident management program.** Incident clearance is a key factor in holding congestion to reasonable levels. Although the county participates in incident management programs for I 85, other areas are not covered. The MPO needs to develop a larger incident management program that focuses on major arteries.
- **Review the need for new bridges.** Major river crossings are very expensive and justifiable only when environmental issues can be mitigated and travel savings are very significant. The proposed new crossing of the Catawba River above Mt Holly would probably not pass environmental muster or compare well to a widening of the current NC 27 bridge. Similarly, the proposed Garden Parkway crossing would probably be more effective in relieving congestion if placed several miles north, at the junction of the Belmont-Mt. Holly Loop and NC 273. The need for widening the US 74 crossing should be re-evaluated in light of a widened I 85.

Demand Reduction or Management

- **Develop a significant ridesharing program.** The LRP presently says very little about ridesharing, shifting the responsibility to CATS for vanpool and express bus service. This is inadequate. The region is too spread out, and too solo-driver oriented, for an employer-based ridesharing program that is locally focused. But a residential-based program jointly with Charlotte (residential to employment) and residential-based programs with outlying towns might be feasible.
- **Review the need for HOT lanes.** Commuter traffic between Gaston and Mecklenburg County now exceeds 20,000 daily commuters, of which about 13 percent (2600 persons,

¹⁵ Hartgen DT and Fields MG, Cost-Effectiveness of North Carolina Highway Projects, Report for the John Locke Foundation, Raleigh NC, May 2004.

1300 vehicles) are likely carpoolers. These volumes (about 100-200 vehicles in the peak hour) are too low to justify a HOV lane¹⁶, but a HOT (high-occupancy *toll*) lane might be feasible through Gaston County if it served to save solo-drivers time and connected directly to the 4-lane section of I 85 in Mecklenburg County. As an alternative to widening to 4 lanes on I 85, a west-bound HOT lane beginning at the Catawba River and extending through the County might be the best option.

- **Expand vanpool and express bus later.** The Plan's description of miniscule vanpool and express bus services are typical of cities in this size range. The problem is that the region has been focusing on technologies (vans, buses) rather than on demand profiles, which are spread out and residential-based. Vanpools and express bus service have their place, but only after and when sufficient demand has been established. The data collected for the regional travel may be useful in locating primary origin-destination pairs that might warrant service.
- **Develop a flexible work hour program.** Regions much smaller than Gastonia should be looking at flexible work hour programs as a way of dealing with congestion at major work sites and activity centers. Even a few minutes shifting of activity times can have a major effect on local congestion.
- **Explore work-at-home promotion programs.** Although the region is not as high-tech as some, its work-at-home share of 'commuting' has increased sharply (39 percent) in recent years and is now 6 times larger than transit/taxi commuting. Yet this occurred entirely without government promotion. The MPO needs to review the role of work-at-home 'commuting' in the region and develop ways of encouraging it.

Planning and Administration

- **Increase the weight placed on congestion reduction and select projects on that basis.** The Plan uses congestion as a criterion in project selection. But it does not use congestion REDUCTION, nor does it give enough weight to congestion. The MPO needs to revise and tighten up its criteria for project selection, giving at least 50% of the weight to congestion reduction. Even better would be to use project cost as well, selecting projects on the basis of cost-effectiveness in congestion reduction. Data for this exercise can be obtained from the regional model.
- **Evaluate the TIP and LRP for congestion reduction.** The Plan contains some of the information needed to determine if it is effective overall. Basically the MPO needs to use the regional model to determine congestion and travel times with and without the TIP and LRP projects.
- **Evaluate major project congestion relief.** Going further, the Plan should use the regional model to assess the congestion reduction for every major project. Projects that involve road widenings, new facilities and similar actions should be given initial review.

¹⁶ The cutoff for efficient HOV use is about 800-1000 vehicles per lane in the peak hour, or about 1600-2000 persons.

- **Strengthen the congestion management plan.** The CMP needs to be strengthened by adding demand-reduction actions and more quantitative evaluation of proposed project impacts. It should also have a congestion monitoring component, and a means of tracking and reporting on congestion regularly.
- **Add model improvements.** The regional model should be updated with a more realistic external matrix. This is particularly important for Gastonia which is on the ‘edge’ of the modeling area and has a large project (the Garden Parkway) that is highly dependent on an accurate future external matrix for evaluation.
- **Coordinate with other MPOs and states.** Perhaps surprisingly, the Plan says almost nothing about other nearby regions, particularly Charlotte, and rapidly increasing travel to and from South Carolina (York County). The influence of these nearby regions on Gaston’s growth rates and on its road needs is immense. The MPO needs to work with these other regions to develop cooperative forecasts of traffic for major projects, and perhaps even agree on project criteria and importance in recommending projects that affect several regions. Another topic of interaction should be ridesharing, particularly to large nearby regions, but also to more distant communities commuting into the Gaston area.

