



**TRANSPORTATION PLAN UPDATE 2025**  
*a long-range transportation plan for the Capital Area MPO*



April 17, 2002

## Part I. Background – About Our Home

3. Our History
4. Our Environment
6. Our People
7. Our Economy
8. Our Challenge

1

## Part II. How We Looked At Our Options

9. Our Goals
12. Quantitative – By The Numbers
13. Qualitative – By The People

## Part III. Recommended Plan

18. Financing
20. Roadways
23. Choice Provisions
26. Demand, Land Use and the Environment
30. CAMPO Structure and Program

3

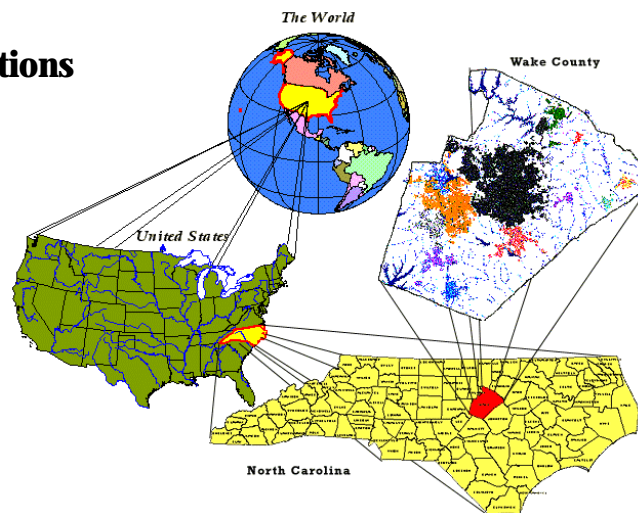
## Revenues

30. Historical Trends
33. Alternative Sources
36. Forecasted Resources
37. Issues on the Horizon

## Appendixes

- a. List of Priority Transportation Projects *Recommended Projects, Maps, and Costs*
- b. Additional Resources Through the Internet\* *Easy-to-reach information*
- c. How We Compare to Other Places\* *Money Magazine comparisons*
- d. More Maps\* *Wetlands, open space, historic properties, demographics*
- e. Summary of Expert Peer Review Panel Comments\* *Qualitative assessment*
- f. How the Travel Demand Model Works\* *In layman's terms*
- g. How We Forecast Future Funds\* *Forecasting revenues explained*
- h. Public Involvement Report\* *The final say on what everyone else said*

5



## Acknowledgements

### Staff of the Capital Area MPO:

- Kenneth W. Withrow, Planner II
- William R. Summers, Planner
- Shae Satterwhite, Budget Analyst
- Brandi Dean, Administration

### CAMPO Member Agencies (TCC/TAC)

North Carolina Department of Natural Resources, Divisions of Air and Water Quality

N.C. Department of Transportation

Federal Highway Administration

Parsons Brinckerhoff

KPMG, Inc.

Bill Allen

Triangle Land Conservancy

Wake County Planning Department

Woods & Poole Econ. Analysis

U.S. Bureau of the Census

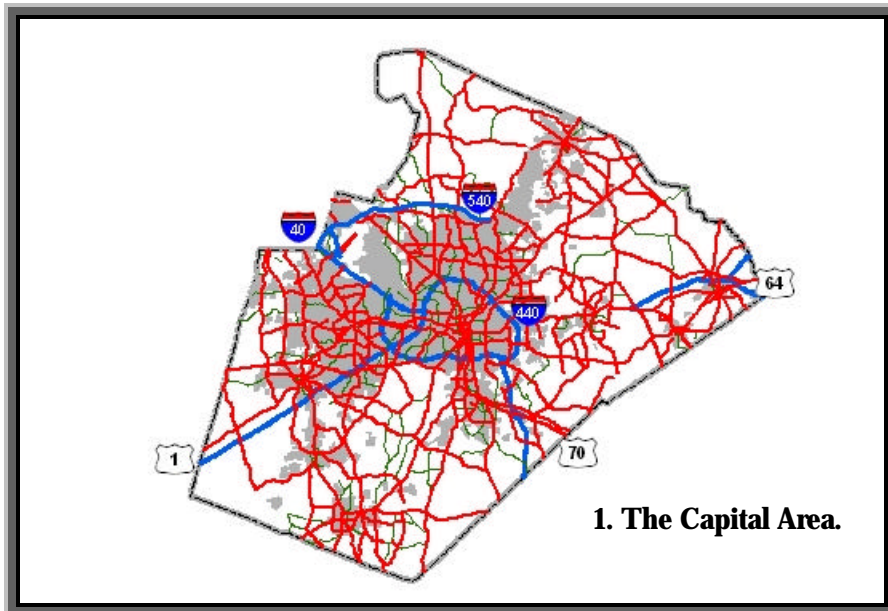
*Although we would like to thank these people and organizations for providing their expertise and information, the responsibility for error is firmly attached to the primary author.*

*- J. Scott Lane, CAMPO Administrator*

\* These appendices are available in a supplemental technical report upon request.

## Part I. Background – About Our Home

The Capital Area Metropolitan Planning Organization (CAMPO) began in 1964 as the Greater Raleigh Urban Area Thoroughfare Plan, a collaborative project between Cary, Raleigh, Garner and Wake County. Since that time, the other nine towns in Wake County have joined CAMPO, which now has boundaries contiguous with those of the county itself (see Figure 1).



The **Capital Area Metropolitan Planning Organization**, like the other 339 or so MPOs across the United States, is comprised of three parts: a **Transportation Advisory Committee (TAC)**, a **Technical Coordinating Committee (TCC)**, and a staff that serves the members of these boards. The MPO is responsible for carrying out an annual work program approved by the CAMPO standing committees, part of which must address updating the **Metropolitan Transportation Improvement Program** (a seven-year project programming schedule) and a **long-range transportation plan** (a minimum twenty-year forecast of projects and programs). It is primarily this last task that we are interested in, so it is worthwhile to detail the requirements of a federal long-range transportation plan:

- The plan must be “multi-modal.”
- The plan must have a horizon of at least 20 years (2025, in our case).
- The plan must be financially constrained; that is, the sum of all projects and programs can’t cost more than the forecasted revenues.
- The plan must be sensitive of air quality such that the forecasted emissions coming from all vehicles on the future transportation

system cannot exceed our emissions “budget.”

- The plan must involve the public in the decision-making process, ensuring that we make special attempts to contact those traditionally overlooked in the transportation planning process, namely low-income and minority populations.

Coupled with these requirements, our 620,000 population in 13 governments<sup>1</sup>, rapid growth, modest history of regional cooperation, and the divide between the agencies responsible for land development (municipalities) and major transportation infrastructure (State of North Carolina) will make this transportation plan a challenging exercise.

<sup>1</sup> CAMPO consists of Apex, Cary, Fuquay Varina, Garner, Holly Springs, Knightdale, Morrisville, Raleigh, Rolesville, Wake Forest, Wendell, Zebulon, Wake County and NCDOT. USDOT is a non-voting (*ex-officio*) member of the policy board of CAMPO.

## Part I. Background – About Our Home

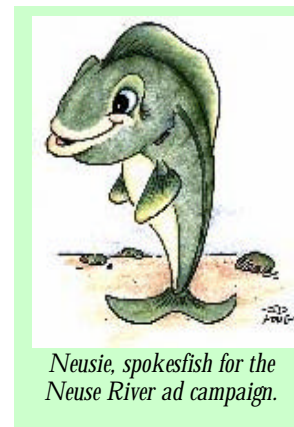
The Capital Area is favored with a wonderful **climate**, not getting too cold in the winter, yet still maintaining a strong seasonality that lets one know when the seasons have changed without looking at the calendar. The mild climate, and our generally flat-to-rolling topography, are conducive to bicycle and pedestrian modes of travel for at least 8-9 months out of the year.

Our **air quality** has been a topic of much discussion at technical, public, and political levels. Recently named as the 11<sup>th</sup> worst metro area in the country for ozone pollution (behind other notables such as New York) by the American Lung Association<sup>2</sup>, everyone seems to know what a “green,” “orange,” or “red” day means. Two years ago, this was not the case. The Capital Area MPO was at its limit in terms of allowable pollutant levels based on its 1999 air quality conformity determination, and this year will also be a challenge for us. The new and tougher eight-hour standard also looms large on the horizon, and promises to set the bar even higher for meeting our emissions goals. Discussions of **greenhouse gases** (primarily carbon dioxide) and global warming have not yet entered into the local environmental limelight, probably due to their unregulated status.

OUR WEATHER	Capital Area	National
Annual days with some precipitation	112	110
Annual days with mostly sun	220	213
Annual snowfall (inches)	7	24.2
Annual days < 32° F	82	88.0
Annual days > 90° F	25	37.9
Average high temp in July °F	87.7°	86.8°
Average low temp in January °F	30°	26.5°

### 2. The Capital Areas’ Weather.

**Water quality** has also been at issue, even though some significant discharge into our streams. The Neuse River rules require a 50-foot to the Neuse. An \$800 million bond package was passed in 1998 to build facilities across the state that will primarily decrease the harmful **and wetlands**. Even so, 117 stream miles are considered impaired in aquatic insects, fish community indicators, and chemical parameters like indicative of troubled streams. New development clears the land and “blowing out” small streams, adding a lot more sediment, clay, and sand on-site mitigation of runoff is being considered in Raleigh and other the general public are also being undertaken.



steps have been taken to reduce undeveloped buffer on tributaries improve wastewater treatment and affects downstream in **estuaries** Wake County: lower diversity of amount of dissolved oxygen are all increases the potential for runoff that affects aquatic wildlife. Full, areas, and educational efforts for

<sup>2</sup> While we recognize the importance that external variables such as prevailing weather patterns, topography, climate, and even the number of monitoring stations play in the ALA’s assessment, the basic message is valid.

## Part I. Background – About Our Home

### **Raleigh Developer Fined \$80,166 For Major Damage To Neuse River Tributary**

RALEIGH - State water quality regulators today fined a Raleigh developer \$80,166 for failing to control sediment run-off from a local subdivision under construction, violating streamside buffers and causing extensive damage to a Neuse River tributary. The unnamed tributary to Turkey Creek is "choking from more than three feet of red clay and topsoil, and aquatic life has really taken a hit," Stevens said. "This project is way out of line and we fully intend to see this mess cleaned up and the creek restored."

"They have failed to maintain erosion control structures and make needed changes out there," said Ken Schuster, water quality supervisor for DWQ's Raleigh Regional Office. "Runoff has cut gashes through the hillsides and the sedimentation basin has washed out. It's one of the worst cases we've seen." Below the construction area, the biologists reported that a temporary stream crossing acts as a dam during high flow and causes massive accumulations of sediment.

Stevens said that, "A number of communities across the state have voiced concerns about upstream development and its effects on water quality and flooding. We're making a concerted effort to find problem sites and deal with them aggressively."

– *Excerpt from NCDENR Press Release, August 4, 2000*

The Triangle's<sup>3</sup> **open space** preservation effort has a strong advocate in the Triangle Land Conservancy (TLC). The TLC recently released *State of Open Space 2000*, which tells us that, while urban area increased by 69% between 1987 and 1997, forested area (-8%), cropland (-23%) and other open space types (-22%) were lost to us. What open space we do have in the Triangle Region is tied up in just a few lake properties, one large park (Umstead), or is associated with our Universities.

There is little question that open space provides a "green feel" to the Capital Area, and that it is one of the reasons for our economic success. There is also little doubt that we are in grave danger of losing that aspect of our community should our development patterns continue as they have in the recent past. Thanks in large part to TLC and our member communities, the Capital Area will preserve over 5,300 acres of open space and 13 miles of greenway in the next five years, at a cost of just over \$20 million.

<sup>3</sup> The Triangle Region is usually thought of as Johnston, Wake, Durham, Chatham, Lee, and Orange counties. The Capital Area is considered to be Wake County only. Unless otherwise noted, these designations will apply in this report.

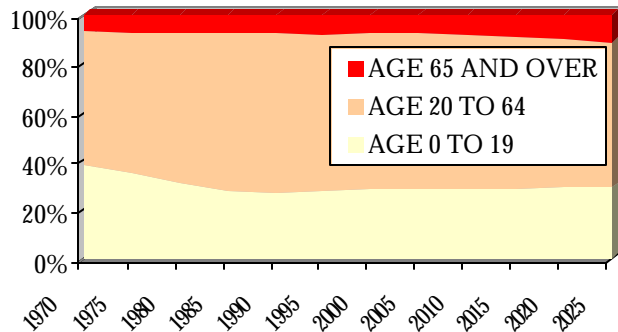
## Part I. Background – About Our Home

The Capital Area is fairly diverse, not only in terms of rural, suburban, and urban land uses, but also in the people that call this place their home. We have the advantage of reporting Census 2000 information that was collected only one year ago, and the figures tell a big part of the story of **our changing population**:

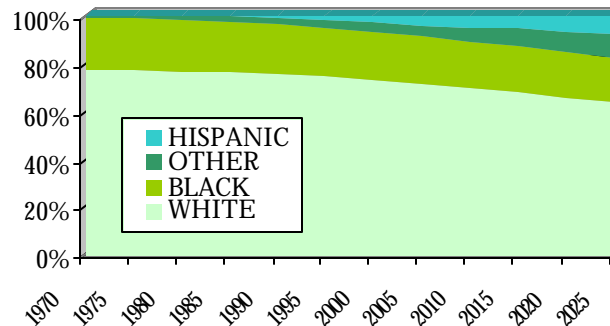
Wake County Census Data	Total Population	Population Over 18	White	Black	Native American	Asian	Other or Multiple Races	Hispanic
<b>1990 Census</b>	423,380	325,565	324,011	88,057	1,148	8,177	1,987	5,396
<b>Census 2000</b>	627,846	470,249	454,544	123,820	2,364	21,461	25,869	33,985
<b>Percent Change, 1990 to 2000</b>	<b>48%</b>	<b>44%</b>	<b>40%</b>	<b>41%</b>	<b>106%</b>	<b>162%</b>	<b>1202%</b>	<b>530%</b>

### 3. The Capital Area MPO Population.

the total population when compared against those persons over 18 years of age. Attracted by our long economic boom, many people are attracted here to start their careers, or simply by the lure of ample employment opportunities. Hispanic populations have increased most dramatically – a six-fold increase over just 10 years. These factors have contributed greatly to our overall economic success – and explain to a large extent why we are regularly experiencing traffic congestion, the rapid decline in open space, overcrowding in our schools, and inadequate capacity in sewage treatment and water services.



But what about the next 25 years – do we expect to see more of the same? The answer is an unqualified *yes*. **Our people will continue to diversify**<sup>4</sup>. This will



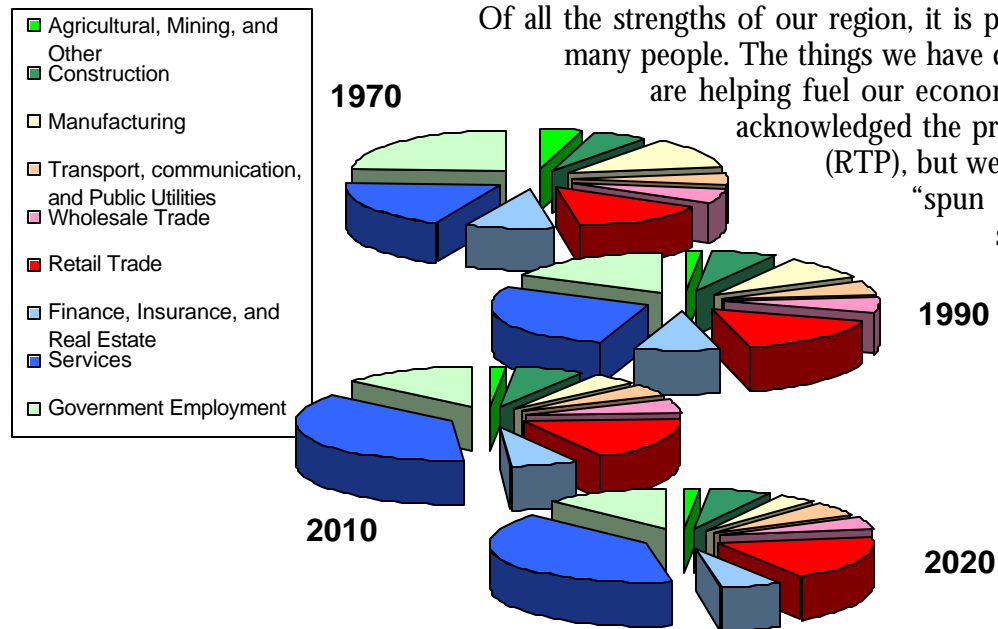
certainly enrich our lives and enhance our cultural opportunities to get to know each another. It will also present some challenges to our communication skills - especially listening.

<sup>4</sup> Source: Woods & Poole Data Pamphlet, 2001.

OUR PEOPLE



## Part I. Background – About Our Home



### 4. People Working In the Capital Area.

This strong economy has fueled even more job growth, in housing construction, human and health services, and other types of employment. It has also spurred traffic congestion, air quality problems, inadequate water, sewage treatment and school capacity, a significant housing shortage in the low- and middle-income markets, and degradation to our environment. In fact, there has been increasing concern that we are “killing the goose that lays our golden eggs,” meaning that we are losing much of what has made us so attractive to business development in the first place. One indicator of this is that it is already becoming more difficult to recruit the high-tech jobs on which much of our economy relies (see box).

Of all the strengths of our region, it is perhaps our **job opportunities** that come first to the minds of many people. The things we have discussed already – climate, environment, educated workforce – are helping fuel our economy. The Capital Area and the Triangle Region have gratefully acknowledged the presence of high-technology firms in the Research Triangle Park (RTP), but we must also recognize that for each of these jobs, many more are “spun off” and are dependent on them for their success. Retail, services, real estate and financial services are all here in large numbers thanks in part to our strong core businesses. But that **growth has not been evenly distributed**; communities in the western portion of the region have had to deal with tremendous job growth, while those in the east have been growing residential subdivisions, but little basic employment.

And we will continue to grow; of that there is no doubt. As we develop, farming, manufacturing, and government services will shrink as a percentage of the total employment. Retail and wholesale trade will increase tremendously, and construction jobs will hold fairly steady as well.

...My husband and I moved to RTP from the Washington DC area to find a good place to settle down, buy a house, continue our careers and get away from traffic. I am convinced that if changes aren't made by area leaders to the traffic situation in RTP in the immediate future, North Carolina will have killed the goose that lays the golden egg. Companies in the Park already offer alternative work schedules to help manage this situation- as evidenced by the now very extended rush hour. Nothing is going to fix this problem with the exception of increased capacity and it needs to come ASAP. I've had several people decline to consider moving to RTP because they have heard about the traffic situation and don't wish to live their lives hostage to it.

I sincerely hope you are able to do something to provide relief before the situation is too far advanced to fix.

**Michele Pardue**  
Senior Technical Recruiter  
Ericsson Research and Development

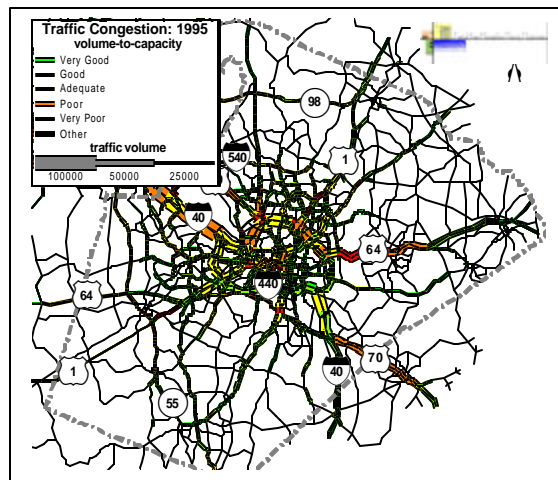
*"It Can Take A Full Hour Just to Go Those 6 Miles..."*

## Part I. Background – About Our Home

So, what does all this mean for the future of the Capital Area MPO, and how can we plan transportation intelligently for that future? Our computer models tell us that by 2025 we will have **more than doubled our existing vehicle miles of travel**, population, and employment. Traffic congestion on our roadways will steadily increase into the foreseeable future, in spite of massive investments in the freeway, arterial, and transit components of the transportation system. Like the two maps below, our future is clear, and it is filled with both opportunities and challenges:

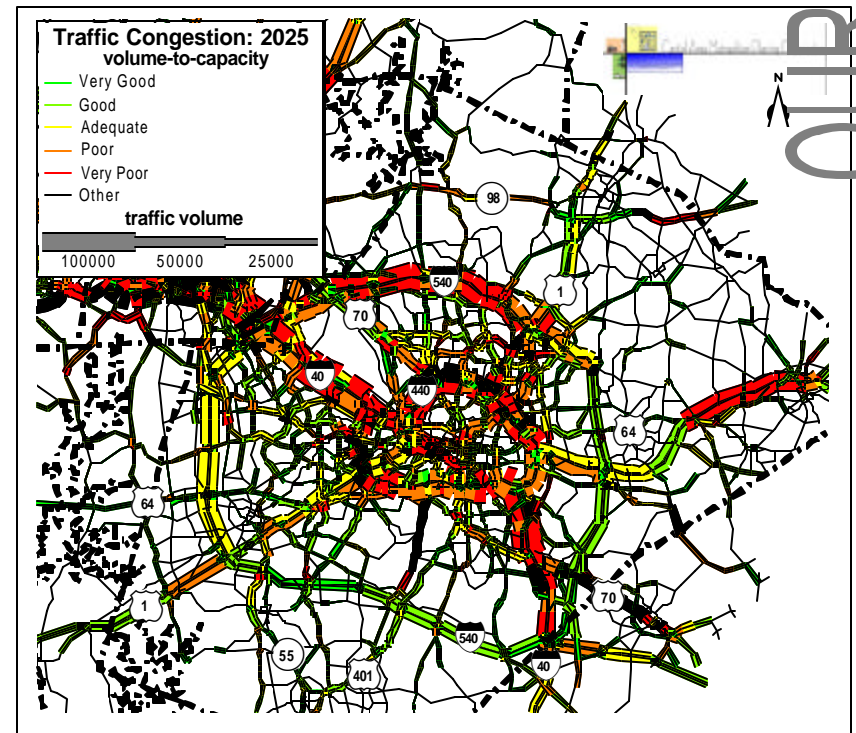
- a continuing challenge to meet our **basic infrastructure needs** for roads, schools, and moderate income housing
- further challenges to meet **air quality** standards, particularly if tougher, new standards are enacted
- the opportunity of a **strong economy** that is increasingly focused on technology and support services
- low-speed **accidents** will probably rise faster than the population rate
- the opportunities *and* challenges that come with increasingly diverse populations in terms of **ethnicity and culture**
- a loss of **open space** and degradation to **stream quality**
- more **traffic congestion** and demand for services

The essential reason that we should be undertaking this update of our long-range transportation plan is to address these challenges. In the next chapter, we will discuss the options that we are considering. The third chapter deals with how we assessed those options. The final plan is the fourth chapter and must be agreed to by a majority of the members of the Capital Area MPO. It will be largely up to those members to implement that plan, incorporate its premises and projects into their local plans, and to provide the continuing guidance needed to maintain and update our vision for the future.



1995  
Congestion  
Levels

→  
2025  
Congestion  
Levels  
(with  
TPU25)





The Capital Area MPO set out in May of 1998 to determine its goals and objectives for this transportation plan. Citizen advisory committees (the “Intermodal Team”), public meetings, newsletters, surveys, and Internet contact were all used to determine these **goals and objectives**. On November 18, 1998, the Capital Area MPO Transportation Advisory Committee formally approved the following vision statement, goals, and objectives:

**Our vision is a multi-modal transportation network that is compatible with our growth, sensitive to the environment, improves quality of life and is accessible to all. The *Transportation Plan Update 2025* commits our region to transportation services and patterns of land use that contribute to a more attractive place where it is easier for people to pursue their daily activities.**

**GOAL ONE: DEVELOP A REGIONAL TRANSPORTATION NETWORK THAT IMPROVES QUALITY OF LIFE AND THE ENVIRONMENT.**

**Objective A: Encourage local and state governments to manage growth more proactively by linking land use patterns, plans and policies with transportation networks, plans and policies.**

**Explanation:** Our region’s transportation facilities are not adequate for the existing and planned development patterns. Current growth management policies contribute to transportation problems. Local and state governments are reactive instead of proactive, and there is not enough emphasis on regional coordination between land use and transportation development. Land use policies and the resulting development patterns must better address transportation issues and implications.

**Objective B: Encourage equitable funding from Federal and state sources for a system that satisfies the region’s transportation needs.**

**Explanation:** Due to the area’s dramatic growth, there is a substantial need for transportation improvements, especially for highway construction. Primary funding sources for highway construction and improvements are the state and Federal gasoline taxes. A significant amount of the gasoline taxes that are collected here are not used to fund local projects. This objective expresses the desire to increase the proportion of state gasoline tax revenue that is used to fund projects in this MPO. There is also a desire to improve the state distribution formulae to insure that Federal highway funds are spent in areas of critical need.

**GOAL TWO: PROVIDE CONVENIENT, SAFE, RELIABLE AND AFFORDABLE TRANSPORTATION CHOICES, AND PROVIDE PUBLIC EDUCATION ON THOSE CHOICES.**

**Objective A: Provide policies and infrastructure that make walking and bicycling more viable modes of transportation.**

**Explanation:** The local land use plans have not adequately integrated the walking and bicycling modes of transportation. The region needs to develop more facilities, policies and programs to make these modes of transportation more viable.

*(Goal Two Continued)*

**Objective B: Promote the benefits of walking and bicycling as practical modes of transportation.**

**Explanation:** *The region needs to begin new efforts to realize bicycling and walking as viable modes of transportation. Promoting the health, environmental and economic benefits of these modes of transportation would help the region realize those benefits.*

**Objective C: Increase funding for alternative modes of transportation.**

**Explanation:** *Funding for alternative transportation modes (including transit) is inadequate. Alternative transportation modes need more funding to give people a choice of transportation other than the single occupancy vehicle. Innovative ways of providing increased funds should be explored.*

**Objective D: Promote land use policies that encourage transit alternatives in local and regional plans.**

**Explanation:** *The local land use plans and policies and their implementation do not adequately accommodate transit-oriented development or other alternative transportation modes. Local and regional plans and policies should support transit alternatives.*

**GOAL THREE: ENHANCE CONNECTIVITY BY DEVELOPING A MULTI-MODAL TRANSPORTATION NETWORK THAT PROMOTES ECONOMIC GROWTH THAT IS COMPATIBLE WITH THE ENVIRONMENT AND LAND USE PATTERNS.**

**Objective A: Improve mobility by planning facilities that enhance interconnectivity and accessibility.**

**Explanation:** *There is a need to plan for and design interconnected facilities due to the region's growth. Facility planning for the region involves the need for interconnecting points to be accessible. These points should be linked to provide timely travel for all people in a seamless manner.*

**Objective B: Improve the coordination of the metropolitan area governments, public and private transportation agencies, freight carriers and transportation users in order to plan for a seamless, interconnected transportation network.**

**Explanation:** *There is a need to better coordinate the interconnectivity of the region. Transit needs to aid the roadway system in this region and there should be an effort to seamlessly coordinate the different companies that serve the Triangle. Because there will be transit route redirection due to the rail/transit relationship in the future, some degree of coordinated planning needs to occur. The key element to this issue is regional coordination for people and goods movement. A major reformation of the transit systems in the Triangle should be reviewed. All parties, including the public, should work to achieve a seamless connection between the systems.*

**Objective C: Develop a better process for identifying, evaluating and prioritizing transportation projects.**

**Explanation:** *The process for locating and prioritizing transportation improvements is not always successful. It does not adequately address public input, is not equitable and is not always technically defensible. The process for selecting projects to be funded needs to be reviewed and overhauled. The objective is to ensure that appropriate ways of measuring the need for each project are used. It was felt that public input was only received when the project had been under study for some time. It would be better to receive public input from the beginning of the project's conception. The inability to schedule projects equally across the metropolitan area was also recognized as a shortcoming to project selection. The location of these projects needs to be communicated to the public with a more up front approach.*

**GOAL FOUR: DEVELOP AN EFFICIENT TRANSPORTATION NETWORK THAT IS BOTH AFFORDABLE AND RELIABLE FOR THE MOVEMENT OF PEOPLE AND GOODS.**

**Objective A: Identify new and alternative funding sources for constructing and maintaining transportation infrastructure.**

**Explanation:** *Funding sources are inadequate and are not effectively or efficiently meeting the needs for transportation improvements and maintenance. There is too much reliance on state and Federal funds. There is too little promotion of innovative funding sources. There is a need for additional funding sources to handle the tremendous amount of traffic that is increasing in our metropolitan area. These new funding sources can come from locally added revenues, statewide efforts, regional efforts and private initiatives. It may be possible for the users of a facility to consider paying fees for specific improvements. There is a need to research the various methods used to fund new facilities, programs and transportation system management tools.*

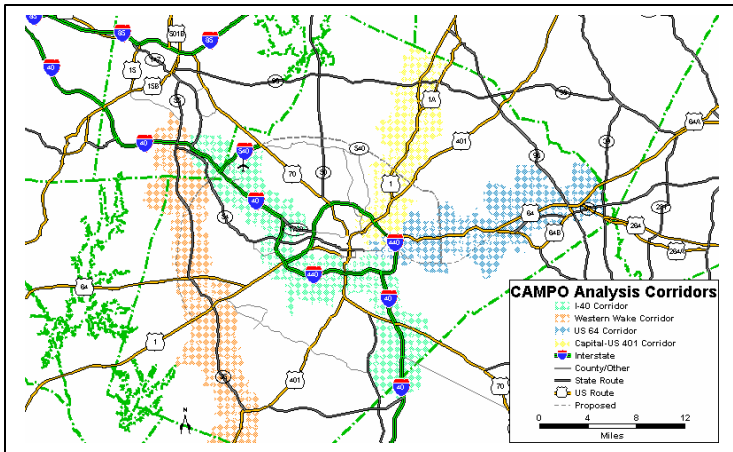
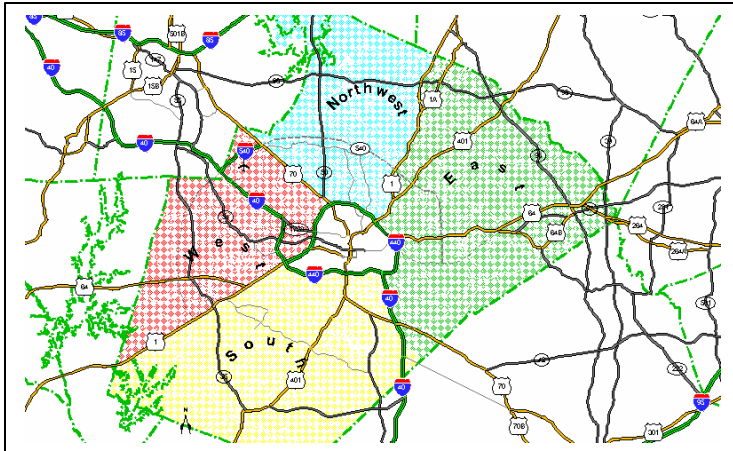
**Objective B: Maximize the highway system efficiency using means other than adding general-purpose traffic lanes.**

**Explanation:** *When evaluating major expansion of the transportation systems, other methods of improving system efficiency should be addressed. New technologies should be tested in our transportation system. Improvements to transit services and education to the public should work toward common goals to improve transportation efficiency. The metropolitan area needs improvements to provide better access to transportation facilities and programs. There is a need for improved access to facilities that have been constructed. New intelligent transportation technologies should help with allowing balanced access and mobility.*

**The establishment of these goals was critical to CAMPO for several reasons.** One, this kind of exercise had never been done before for the full MPO (all 13 governments). Two, this establishes a baseline test against which we consider all sorts of alternatives that are presented regularly to the MPO boards and staff. Most importantly, these principles are the foundation for our long-range transportation plan. We require our staff to review this vision, goals and objectives periodically, particularly during an to any element of the long-range transportation plan. We should never forget this guidance, even though it is often general. Finally, the work that was done on these goals and objectives, while they may mirror similar documents across the country, helped establish this MPO as an organization that wants feedback from its constituents. We may not be able to get it right every time, to go as far as some would like to see us go in any one direction, and we will certainly make mistakes along the way. But we know that our public entrusted us with this set of blueprints, and it is up to all of us to respect their wishes.

**We should revisit these goals** at the beginning of each new plan update to determine if they still meet our needs. If there is a desire to change, it should be done out in the open and with full participation of our public, technical staffs, and elected officials.

Like most transportation plans, the *Transportation Plan Update 2025* document has **numbers describing the performance** of its proposals. Costs, revenue streams, levels of service (LOS), volume-to-capacity ratios (V/C ratios), population and employment growth, and vehicle miles of travel are not hard to find in any transportation plan. Usually, many of these numbers are obtained by testing plan options in a model, which, strictly speaking, is a simplification of a real-world environment. The model that CAMPO used



for its transportation plan update is the latest available version (5-2001) of the Triangle Regional Model, or TRM for short. The TRM was constructed through a partnership between the North Carolina Department of Transportation, Durham-Chapel Hill-Carrboro MPO, Triangle Transit Authority, and CAMPO. But the way that we used the model for looking at our transportation options is a little out-of-the-ordinary, and deserves some explanation.

Miles of Congested Roadway  
Average Travel Speeds (Model Speeds)  
People Using Different Ways of Traveling  
Accessibility (in minutes)  
People within ½-mile of transit  
Historic Sites Within 2,000 feet of Construction  
Direct and Indirect Open Space Impact  
Wetland Impacts  
Air Quality (Ozone)  
Home-Based Work Trip Spent in Congested Conditions  
Number of Jobs Divided by Delay  
30-Minute Travel Time Isochrones  
Traffic Analysis Zones with Multiple Modes

#### 5. Partial List of Performance Measures.

Travel demand models are capable, either directly or indirectly, of providing valuable information about travel behavior, not just ridership figures on transit systems or the number of cars on a road. The model records forecasted trip lengths, descriptions of people and jobs in tracts of land called traffic analysis zones, and other characteristics of travel, which can often be obtained by trip type and time of day. Figure 5 shows some of the performance measures included for every plan option. Many of these options are expressed not only in CAMPO-wide measurements, but also in special corridors and districts (see maps at left) that subdivide the CAMPO planning area. In this way, we could **better ensure that impacts were not lost** in the background “noise” of the larger system.

## Part II. How We Are Looking At Our Options

But not every impact can be measured accurately with a formula or a figure. How do you count the worth of open space to a community, or talk about the give-and-take between objectives like the purity of the air, economics, and wetlands? Even the best models have proved to not be totally reliable in predicting impacts, especially when looking far into the future. CAMPO wanted to be able to assess its transportation plan options in a way that was consistent with our goals and objectives. To do this, we used two primary techniques: **(a) public outreach and (b) an Expert Peer Review Panel** process.

CAMPO will hold at least three **open public meetings** to try and solicit input from the general public. We will also send out a **newsletter** to a stakeholder list established during the survey process for the Goals and Objectives. We will make use of **Internet** technology, and translate our plan summaries into Hispanic format. We already do these activities a lot, particularly when it comes time to assess our project priorities and develop the Metropolitan Transportation Improvement Program, a seven-year funding and project schedule for our area. We also hope to get invited to club meetings, citizen advisory meetings, town councils, appointed boards, and **anywhere else people want to understand what is going on**. The input we get from these meetings will help us refine our draft plans and move forward to a final plan in the fall of this year. This public involvement will occur over the summer, after the Expert Peer Review Panel has been completed.

The second way we wanted to solicit this subjective input was through the **Expert Peer Review Panel** (see Appendix b). Members of this panel had expertise in one of several performance areas: community impact

(environmental justice), mobility/safety, reliability/accessibility, economics, wetland/stream impacts, air quality, and open space preservation. One out-of-state and one in-state expert were chosen for each performance area, and each was required to review and consider this document. Then, they had to complete a **brief survey** and attend an **open forum** held on June 18<sup>th</sup>. At this forum the Panel Members were asked to discuss national and local trends in transportation and to address concerns and benefits they associated with each plan option. A detailed summary of the comments are available at the end of this report in the section *More Information*. The Panel Members generally favored one of the alternative land use options married to the M2: Current Trends and Managed Lanes/Rail transportation option. Other options were cited as acceptable to some of the Panelists, but almost all stated that the most intensive highway option was not desirable. The desire for more transportation options than the current system allows and the long-term negative impacts to the environment, economy, and transportation were common reasons for this stance. The Panel Members also discussed trends related to the reaction of land use to new transportation facilities, the importance of smart growth development that minimizes vehicle miles of travel and maximizes transportation options, and the need to develop corollary planning for open space and wetlands protection.



*Part II. How We Are Looking At Our Options*

<b>PERFORMANCE AREA / NAME</b>	<b>BIOGRAPHY</b>
MOBILITY / ACCESSIBILITY  <b>Bill Finger, P.E., Assistant Director Charlotte-Mecklenburg DOT</b>	Bill has worked at the Charlotte-Mecklenburg DOT for over 20 years. His experience includes helping implement many of the advanced traffic congestion alleviation measures in the Charlotte area: reversible lanes, camera ticketing, and more recently, high-occupancy vehicle lanes and busways.
SAFETY / RELIABILITY  <b>Ann Lorscheider, P.E., P.T.O.E. Traffic Operations Engineer, NCDOT</b>	Ann is a registered Professional Engineer in the state North Carolina and currently works in the Traffic Engineering and Safety Systems Branch for the NCDOT. She is a recognized expert in the field of Intelligent Transportation Systems (ITS).
ECONOMICS  <b>Michael Williams, Vice-President Karnes Research</b>	Mike Williams worked in Charlotte's Economic Development Department and the Charlotte Mecklenburg Planning Commission. He also worked with computer forecasting models. He was recently named Vice-President of Karnes' Research Company's Triangle office.
ENVIRONMENT – WATER QUALITY  <b>John Hennessy, NCDENR Div. of Water Quality</b>	Mr. Hennessy works for the N.C. Department of Environment and Natural Resources in the Water Quality Division. He has personally reviewed and field-checked hundreds of road projects for NCDENR and the N.C. Department of Transportation.
ENVIRONMENT – OPEN SPACE  <b>Kate Dixon, Executive Director Triangle Land Conservancy</b>	Kate Dixon has served as the Executive Director of the Triangle Land Conservancy since 1992. Under her guidance, the organization has been instrumental in increasing land under protection, promoting regional planning efforts to protect open space, and orchestrated three Capital Campaigns for land acquisition of approximately \$5.4 million.
ENVIRONMENT – ENV. JUSTICE AND COMMUNITY IMPACTS  <b>Dr. Brian J. Morton, Senior Economist EC/R Incorporated</b>	Dr. Morton is an economist specializing in air quality issues with over 15 years experience in teaching, policy analysis and development, and consulting. Currently, he serves as the Vice Chairman of the Environmental Affairs Board of Durham County.

**6A. In-State Expert Peer Review Panelists.**



*Part II. How We Are Looking At Our Options*

<b>PERFORMANCE AREA / NAME</b>	<b>BIOGRAPHY</b>
<b>SAFETY/RELIABILITY</b>  <b>Dr. Arun Chatterjee, Instructor</b> <b>Univ. of Knoxville-Tennessee</b>	Dr. Chatterjee is a professor of Civil Engineering at the University of Tennessee at Knoxville. His areas of specialization include travel demand modeling, transit, and freight and air quality analysis. He has developed travel demand models for several urban areas.
<b>ECONOMICS</b>  <b>Dick Voith</b> <b>Professional Consultant</b> <b>Econsult Corporation</b>	Mr. Voith has been an Economic Advisor in the research department of the Federal Reserve Bank of Philadelphia. He has published extensively in the areas of transportation, real estate, and factors influencing the patterns of metropolitan development. He has been on the Board of Directors of the Southeastern Pennsylvania Transportation Authority since 1992, serving as Vice Chairman for three of those years.
<b>MOBILITY / ACCESSIBILITY</b>  <b>Dr. Daniel Rathbone, P.E.</b> <b>President, DBR &amp; Associates</b>	Dr. Rathbone is the chief editor, founder and publisher of the Urban Transportation Monitor, a bi-monthly publication dealing with a wide range of urban transportation issues. He is also the President of DBR & Associates, has written more than 70 papers, and served on several ITE and TRB committees.
<b>ENVIRONMENT - WATER QUALITY</b>  <b>Shari Schaftlein,</b> <b>Deputy Director of Environmental</b> <b>Services, Washington State DOT</b>	Mrs. Schaftlein serves as the Deputy Director of Environmental Resources for the Washington DOT. She guides implementation of all environmental services and integrates them throughout the Department. Over the past 7 years, she developed and led nationally recognized initiatives and programs related to watershed based mitigation and environmental streamlining.
<b>ENVIRONMENT - OPEN SPACE</b>  <b>Bill Elmendorf, Instructor</b> <b>Pennsylvania State Univ.</b>	Mr. Elmendorf is regarded as an expert in the field of Forest Science. Currently, he serves as an instructor and program coordinator in community forestry at Penn State University. He also supervises and coordinates a state-wide extension program.
<b>ENVIRONMENT - ENVIRONMENTAL</b> <b>JUSTICE AND COMMUNITY IMPACTS</b>  <b>K. Lynn Berry</b> <b>Community Impact Specialist</b>	K. Lynn Berry works with MPOs, State Departments of Transportation, and FHWA Division offices to encourage innovative public involvement techniques, assess social and economic impacts, and achieve environmental justice. She regularly conducts training and workshops on these topics. Recent presentations include a CIA workshop for the Puerto Rico Highway and Transportation Authority, EJ training for the ACEC/G, ASCE, and GSPE Joint Summer Meeting, and the NHI Public Involvement course for the Kansas DOT.

**6B. Out-of-State Expert Peer Review Panelists.**



## Part II. How We Are Looking At Our Options

Finally, we get to our initial transportation plan options. These were created based upon a review of the goals and objectives, a public survey stating the needs and problems of our area, and by a collaboration of the professional staff across the Capital Area.

There were 10 options in the beginning: five transportation options, including one “trends” scenario; and five more land use options, each of which uses the same “Managed Lanes and Transit/Rail” transportation system option. We modeled different land use scenarios to get an idea of whether or not there was a differences in transportation system performance if our population and job growth occurred in patterns other than our current trend, which is fairly sprawling, decentralized, and low-density. Each of the transportation options assumes a somewhat different philosophy as well, adding new roadways, more careful management of the future system, or more emphasis on transit, including passenger rail in some corridors. All of these options were approved by CAMPO for testing:

Transportation Options (4 + 1 baseline scenario)	Land Use Options (5 using the M1 Transportation Option)
<b>H1: Current Trends and Update (2025 Baseline)</b> <i>This plan will be used to establish a baseline for comparison of the other alternatives. This is not a “Do Nothing” alternative, however; this plan contains many roadway improvements, the first phase of a regional rail system, and projected local transit improvements.</i>	<b>M1a. Mixed-Use Suburban Employment Centers</b> <i>Employment/activity centers achieve 30 percent more growth than under current trends. Growth in all other areas slightly reduced. Slightly higher localized densities in employment centers. Residential development continues to occur at same density as present.</i>
<b>H2: Intensive Highway</b> <i>This plan contains the most highway alternatives, with minimal attention given to additional rail system improvements beyond the first phase of the regional rail system. Some planned Intelligent Transportation System (ITS) and travel demand management activities are assumed to occur, but are not emphasized.</i>	<b>M1b. Concentrate Employment Growth in Corridors and Nodes</b> <i>Corridors achieve 30 percent more growth than under current trends. Growth in all other areas slightly reduced. Density of development along corridors increases slightly. Approximately one-third of the region’s employment growth occurs along these corridors.</i>
<b>M1: Managed Lanes and Transit/Rail System</b> <i>New High-Occupancy Vehicle lanes and an extensive regional rail system are combined with direct transit service to provide the most substantial focus on transit improvements to accommodate forecasted travel demand.</i>	<b>M1c. Compact Cities: Flexible Growth Boundary</b> <i>Most employment and residential growth would occur inside a growth boundary. Residential development would be slightly greater than twice current development densities. Employment densities would also be significantly higher.</i>
<b>M2: Current Trends and Update + Managed Lanes/Rail</b> <i>The roadway improvements contained in the Current Trends Plan (2025 Baseline) are used with the Managed Lanes + Rail System model to provide a more balanced set of improvements.</i>	<b>M1d. Compact Cities: Adequate Public Facilities</b> <i>A level-of-service based roads test would be used to determine the amount of employment and residential development permitted in the study area (including Wake, Johnston and Granville Counties). Ambiguous effect on development density.</i>
<b>M3: Intensive Management and Rail System</b> <i>This plan cuts back substantially on the Intensive Highway improvements, and replaces it with substantial new rail and regional transit service. Increased and widespread demand management and ITS improvements are also envisioned</i>	<b>M1e. Increase in Neotraditional and Infill Development</b> <i>Approximately 40 percent of new housing and 35 percent of employment growth in neotraditional/infill nodes. Residential density is roughly twice current standards within these nodes. Employment density is somewhat higher (approximately 30 percent). Effort to improve mixture of housing and employment within selected TAZs.</i>

### 7. The Transportation Options.



## Part II. How We Are Looking At Our Options

Once the analysis was completed on the 10 transportation options, a report was released to describe the quantitative and qualitative impacts (Expert Peer Review Panel), the *Options Analysis Report 4.1*. This report, still available in electronic format, introduced us to the issues of the Capital Area MPO and presented the initial findings of the analysis procedures. From this point, district meetings were held with CAMPO's member agencies to help determine adjustments to three strategies: the Capacity Focus (similar to Highway Intensive, above), Choice Focus (similar to Current Trends and Managed Lanes/Rail), and Managed Choice (similar to Intensive Management and Rail option). These three options were compared to the Baseline 2025 option in a newsletter released in November of 2001, which included the following comparison of these four alternate strategies shown in Figure 8.

The four strategies kept the same range of philosophies as the original 10 options, but these became more specific and included preliminary cost estimates (excluding operations).



Strategy		MTIP/CIP	Phase I Rail	Alternative Land Use?	Major Rail Expansion	HOV/HOT Lanes	Major Road Expansion	Express Bus Service	\$ Project Mix
									System Cost <div> <div></div> road <div></div> transit/HOV <div></div> support </div>
0	<b>Baseline 2025</b> MTIP and Municipal Projects Only								Total: \$3.29 bil.
1	<b>Capacity Focus</b> Increase Roadway Capacity								Total: \$6.74 bil.
2	<b>Choice Focus</b> Add additional premium transit, managed lanes								Total: \$4.5 bil.
3	<b>Managed Choice</b> Add roads, transit, and manage demand								Total: \$6.95 bil.

From these three, the Managed Choice strategy was selected as the draft preferred alternative, with some modifications and additional detail, such as adding managed lanes on I40 between NC 147 and Wade Avenue, as well as specifying programmatic elements. The following pages describe in detail the preferred strategy and how to implement the projects and programs contained in the long-range transportation plan.

The final chapter looks at available revenues and compares them to project and program cost data.

### 8. Comparison of Three Plan Strategies.

**FINANCING** *Every two years, the Capital Area MPO asks for and receives many priority projects from its member agencies. This exercise serves the purpose of prioritizing funds, and also establishing a set of recognized needs well beyond what Federal, state, and local resources can accommodate. The following recommendations address some of these issues.*

-  1. Individual municipalities should expect to pay a larger share of secondary road improvement costs. While the amount of money in the MTIP has increased in recent years, these funds have gone to an ever-shrinking number of large freeway projects. CAMPO recognizes, and should support, local efforts to acquire funds through development impact fees and other mechanisms. The inclusion of Wake County in these efforts is vital to ensuring that new development isn't exported away from areas that have existing transportation and other public infrastructure, and thus working against the defined goals in this plan. The Financing Section of this report describes some of the potential for various taxation measures that could be used to increase revenue streams for all modes of transport, including mass transit. The Regional Transportation Alliance has identified a \$10.1 billion shortfall in revenues just in Durham, Wake, and Orange counties. The need for new revenue sources extends to transit, bicycle, and pedestrian modes of travel as well. Again, refer to the Financing Section for more information on this study.
  - Corridor studies
  - Education programs targeted at safety, mode choice, and air quality improvement
  - Peak period trip reduction programs
  - Intersection capacity and safety improvements
  - "Greenprinting," a map that shows high priority natural and man-made features (e.g., historic)
  - Growth management and economic development guidance and/or implementation
  - Collector street plans
-  2. CAMPO should direct its available STP-Direction Allocation funds (now approximately \$4.5 million annually) to projects that adhere to the goals of the LRTP. The following items shall receive priority consideration in future Unified Annual Work Programs (UPWP):
 

Unless otherwise amended by the CAMPO boards, these tasks should receive priority funding attention in future work programs.



*Part III. Recommended Plan.***FINDINGS AND JUSTIFICATION**



This set of recommendations addresses Goal 1A (link land use patterns and growth to transportation plans); Goal 2C & 2D (increase funding for alternative modes of transportation and promote land use policies that encourage transit alternatives).

The Capital Area MPO undertook a thorough review of various alternative roadway configurations, and determined that a mixture of new freeway and secondary road improvements was most beneficial to its development and mobility challenges. These projects are shown in Appendix A.

By creatively using additional local funds and federal STP-DA funds, intersection projects, short or “bottleneck” widenings, and transit studies can be funded. CAMPO is working with NCDOT now to address the issue of project planning and design, and expects to present a draft process in February. CAMPO members should begin considering project selection now, with a priority placed on those projects contained in the most recent Project Priority List. This will help ensure their inclusion in the 2004-2010 MTIP/STIP. Using these funds to advance projects that actively work toward achieving this plan’s goals can begin to represent the real benefits of implementing the plan locally, and is therefore a key recommendation.



**ROADS** *Although about 93% of our trips are made in cars, the roadway serves people traveling in private cars, taxis, buses, bicycles and walking. CAMPO is committed to providing high quality roadway service to its member agencies and public. The construction of new and widened roads must be performed in context with the existing natural, historic, and economic frameworks that have helped to create the demand for the new service. Safety for all modes of transportation is also a high priority, and is accomplished through sound engineering practice, education, and intelligent design.*

-  1. Implement selected roadway projects already on the Metropolitan Transportation Improvement Program (MTIP), define additional projects that may be constructed by 2025 (see Appendix A.), and identify projects that may be constructed if sufficient funds become available (post-2025) as shown on the most recent CAMPO Thoroughfare Plan. Proposed cross-sections and posted speeds should be noted for each facility, their primary purpose (e.g., mobility or congestion relief, economic development/land access, safety) as well as their significance to air quality standards. These projects' location and specifications should be internally consistent (e.g., a road whose primary purpose is throughput of traffic should consider access controls like medians and higher driveway spacing standards) and conform to the guidelines listed in the Land Use provisions of this plan. Future exceptions must be approved individually by the CAMPO boards during an annual review, or during the triennial update process.
-  3. Encourage appropriate management of access, and increase access restrictions where appropriate. The impacts from cross-streets, traffic signals, and driveways are the single largest determinant (after number of traffic lanes) of roadway capacity. Encouraging cross-access between adjacent properties, deceleration lanes, longer driveway spacing on arterials, purchasing access rights and properties, and the utilization of medians all promote a better transportation system. Done correctly, access management not only has no impact to existing businesses, but even promotes more business development due to safer and less congested conditions. Agencies supporting these actions should be given higher priority in project selection than those that do not. CAMPO recognizes two criteria that would call for additional levels of access control (excluding localized conditions such as those at intersections):
  - Environmentally sensitive areas (wetlands and natural heritage sites) such as those shown on the adopted "greenprint" map; and
  - The purpose and need of the roadway is such that mobility is placed at a substantially higher level of importance than adjacent land access and development.
2. Encourage local collector street systems by providing financial support of these efforts. Collector streets enhance the economic development potential of an area, provide an alternative to traveling on major arterials, and improves short-range transportation as well as distribution of traffic from high generation facilities and special events. A collector street plan should not only consider physical layout of streets, but

*Part III. Recommended Plan.*

4. Increase the efficiency of the existing system and new projects (\$79 million). The advent of Intelligent Transportation Systems provides new opportunities to increase capacity without increasing impervious surface area. The following projects have been identified as priorities:

- IMAP Expansion (\$500,000 + \$250,000 each year)
- Freeway Management System Upgrades (\$28,000,000)
- Ramp Metering at I-40 (4 locations), I-440 (4), and I-540 (2) (\$2,500,000)
- Control Center Interconnection (underway)
- Operations & Maintenance Plan (NCDOT)
- Signal System Upgrades in Cary, Raleigh & Garner (\$43,000,000)
- Web-based information systems (NCDOT)
- Quarterly regional ITS meetings

Often these improvements translate into the betterment of our air quality as well. New project proposals should note what measures have been considered and should be part of the “built-in” cost of any new major arterial or freeway facility. Additional training and education should be sought to

CAMPO staff and member agencies to familiarize them on the benefits, costs (including maintenance), and integration of these technologies.

5. Initiate and complete a study to identify unsafe intersections with high incidences of automobile and/or pedestrian and bicycle accidents; engineer solutions, and costs in FY 2003 of the annual Unified Planning Work Program. (A second phase should also look at freight movements to make important truck and rail shipping less costly and safer.) The outcome should be a set of recommended improvements, costs, and implementation schedule for adding these intersections to the Transportation Improvement Program.
6. Re-examine, in detail, the benefits and costs associated with constructing sections of the I-540 Outer Loop as opposed to upgrading secondary roads. (\$80,000) The complete scope of this work is to be developed by the TCC or appointed subgroup and approved by the Transportation Advisory Committee this year.

**FINDINGS AND JUSTIFICATION**

By linking new road construction or other roadway capacity improvements to land use development, water and sewer provision, and other elements of the natural environment, we can effectively address CAMPO's goals, namely Number One (quality of life and environment), Number Three (enhance connectivity, economic growth) and Number Four (develop affordable and reliable system for movement of people and goods).


Nearly all trips, whether made in a car alone or with someone else, bus, bicycle, or walking use a roadway at some point during the trip. Everything from visiting a park to an ambulance trip now uses roadways to a degree unimaginable even 60 years ago. Computer modeling has indicated substantial capacity deficiencies in the Capital Area in 2025, although examples of capacity deficiencies are abundant even today in the peak hours of travel. Traffic congestion is a universal phenomenon in a vibrant community, but also depends on the perception of individuals and communities (i.e., Atlanta doesn't believe we have

severe traffic congestion, and Los Angeles thinks the same of Atlanta). CAMPO is defining congestion over a four-hour peak, thereby not reacting to highest hour demands, which have proved historically to be difficult - if not impossible - to "fix," even under the most aggressive building scenario. Nevertheless, improving roadway capacity must remain a priority for the many people who use automobiles, buses, and trucks to move people and freight. We must recognize that mitigating the negative impacts of these facilities will continue to increase in difficulty and cost, making early detection and avoidance critical features of project and plan development.

Finally, lingering concerns about the cost and benefits of the Southern Wake Freeway as expressed by CAMPO staff and the TCC prompted the inclusion of another study to examine the secondary and cumulative impacts and mobility benefits of this project as compared with other alternatives, such as widening existing secondary roadways.

*Part III. Recommended Plan.*

**CHOICE PROVISIONS** *In the previous section on roadways, we noted how important the private car and its use have become here. In this section, we recognize the importance of providing choices, for at least three reasons: (1) capacity expansion of roadways do not necessarily lead to long-term traffic solutions, especially in an economically viable community like ours; (2) the examination of, and reaction to, roadway service levels (“congestion”) does not address the needs of the elderly, disabled, or persons who cannot depend on having a reliable automobile at their disposal; and (3) great metropolitan areas have great ways of getting around, providing economic benefit, reducing car travel and emissions, and helping to bind us together as a region.*

-  1. Adopt a high level of commitment to providing regional transit choices in those corridors that are already congested and are not resolved by additional roadway capacity. Although specific forms of transit technologies, alignments, service levels, and stop locations may shift as a result of more detailed corridor-level studies, CAMPO should commit to providing a premium transit service in these corridors. The following studies should consider a range of environmental impacts, costs, and alternatives such that they meet the criteria for a Phase I Environmental Impact Statement (EIS), thereby reducing potential planning costs in the future. Each study should look at roadway improvements, transit, bike/walk, and alternative land use scenarios designed to maximize the usage of any alternative mode considered.
- I-40 Corridor (NCDOT-underway): Managed lanes, allowing bus and carpool users access during peak periods. Automated tolling may be considered to allow single-occupant users (SOVs) to “buy in” to the managed lanes, should there be sufficient available capacity. A final system and phasing will be determined through the NCDOT I-40 Congestion Management Study and in partnership with the Durham-Chapel Hill-Carrboro MPO.
  - Western Wake/NC 55 Corridor (\$1.0 million): Perform a detailed corridor study to determine transit viability, a preferred technology, costs based on preliminary design, mitigation, land use modifications, and station concerns, as well as a funding and implementation schedule. Public involvement should be a feature in determining preliminary design elements (including bike/walk access), along with detailed discussions with local government and impacted agency staff. The towns of Apex, Cary, Holly Springs, Morrisville, and Fuquay Varina are directly impacted and should be co-sponsors of the project. The Research Triangle Foundation, Triangle Transit Authority, and Raleigh-Durham Airport Authority should also co-sponsor the project, having a direct interest in its eventual outcome.
  - US 1 North/Falls-of-Neuse Road Corridor (\$750,000): Perform a detailed corridor-level study to determine the costs of conversion of US 1 to a freeway facility (preliminary design), including managed lanes. The study should also determine the viability of rail and bus rapid transit in this corridor. Impacted governments and co-sponsors in this effort are Wake Forest, Rolesville, and Raleigh.



Note: A  indicates that this is a key priority for these recommendations, or that it supports other recommendations.



*Part III. Recommended Plan.*

- Eastern Wake/US 64 East Corridor (\$900,000): Perform a detailed corridor study to determine the costs and viability of rail, managed lane (US 64 Bypass), and bus rapid transit in this area, serving Knightdale, Wendell, Raleigh, and Zebulon.
  - US 70 South Study (\$700,000): Determine rail and bus rapid transit viability in between Raleigh and Garner, including future state expansions to Fayetteville. Garner, NCDOT, and Raleigh are logical co-sponsors of the study; Johnston County should also participate.
  - US 401 South Study (\$600,000): Determine rail transit viability between Raleigh and Fuquay Varina, including future state expansions of service to Fayetteville. NCDOT, Raleigh, and Fuquay Varina should be project sponsors; Harnett County and/or Angier may also participate financially in the study.
2. Continue to support the Triangle Regional Rail Project, Phase I (\$770 million total for regional project) Although one of the most difficult transit corridors in which to plan and design a rail project in the area, the Triangle Transit Authority is nearing completion on a preferred system for the Raleigh-to-Durham line. Portions of this system are to be in place by 2008, while other extensions will be provided at a later date.
  3. Support plans and specific actions that increase connectivity between different transit systems and other modes of travel. Seamless farebox collection, coordinated scheduling, and joint projects such as intermodal stations should all be supported either directly or indirectly by CAMPO. Pedestrian and bicycle accommodations at transit stations and on transit vehicles should also be supported.
  4. Increase the viability of existing transit services through technological improvements. (\$11 million) A number of projects can be implemented in the short-term (5-10 years) using existing technologies that would improve on-time performance and access to existing and proposed transit systems. The following are noted as priorities for implementation:
    - Smart Cards (\$3 million)
    - Bus Arrival IS/Vehicle Preemption for EMS, TTA, CAT and other transit service providers (\$1,000,000)
    - Regional Traveler Information Center (\$400,000 + \$600,000 each year for operations)
  5. Actively encourage the preservation of transit rights-of-way. (unknown; estimated at \$5.0 million) Without the use of existing rights-of-way, impacts from new rail service and its costs increase dramatically. Once lost, it is often prohibitively expensive to re-acquire. Although difficult to “cost out,” this task is critical to keeping a rail and other transit options viable.



Note: A  indicates that this is a key priority for these recommendations, or that it supports other recommendations.

**FINDINGS AND JUSTIFICATION**

These recommendations speak directly to CAMPO's transportation goals One (improving quality of life and the environment) and Two (provision of viable and competitive choices), adopted by the Capital Area MPO.

Computer modeling of travel demand, as well as peer assessment, has shown that while additional roadway capacity in high-demand corridors provides short-term relief, new traffic and changes in travel behavior adjust to a higher level of demand. This reduces the effectiveness of the new roadways and calls for other choices in these areas.

Public involvement conducted by both CAMPO and NCDOT indicate clearly that transit service is part of the solution to traffic congestion. Although transit service today minimally improves roadway congestion, it should offer a time-competitive and viable choice for those people choosing to live and work with access to these corridors.

People without access to a (reliable) private automobile, a situation disproportionately inflicted upon people with lower incomes and minority groups, typically benefit more from better transit service and more travel choices. The aging of the Capital Area MPO's population is also better served when more choices are available.

Alternative travel modes are a critical complement to demand management programs, "smart growth" initiatives, downtown revitalization, and other land use objectives. Several of these recommendations speak to the issue of personal safety, noted as the first priority during a 1999 survey of 400 area residents.

Successfully developing and marketing these choices should result in real air pollution reductions that may also be critical to meeting the eight-hour ozone and particulate matter standards anticipated to be applied to CAMPO as early as Spring, 2004.

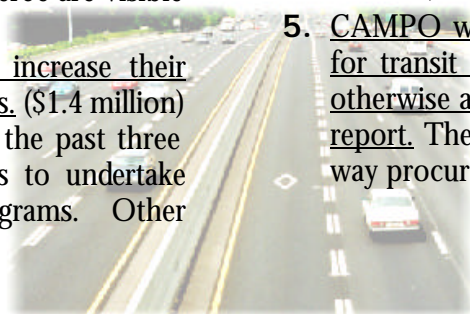


**DEMAND, LAND USE, AND ENVIRONMENT** *These elements, although not directly controlled by transportation infrastructure or programs, are nevertheless often indirectly or directly influence the cost, location, and reaction to proposed transportation services. It is becoming commonplace for a transportation project to be delayed or increased in cost due to unforeseen environmental or community damages; indeed, it is becoming more commonplace as the built environment encroaches on natural areas. These issues – people, the use of land, and the scenic, historic, and important natural areas – are a part of what makes our place so attractive to people and employers.*

1. Considerable efforts are now underway to provide water and sewer service to our urban areas, as well as to protect the remaining undeveloped or agricultural lands in the Capital Area. Transportation should support these efforts, not work at cross-purposes to them. Major arterials and freeways constructed on new location should be limited to the high growth corridors. Roadway widenings should likewise be restricted to these areas; where this is not considered feasible, then the procurement of access rights to limit secondary growth and development adjacent to the new roadway shall be exercised by the appropriate agencies with jurisdiction in these areas.
2. CAMPO should be a major partner, and occasionally the lead agency, in the development of growth guidelines and specific actions that all of our member agencies can use to extend the life of transportation infrastructure and that promote economic vitality. Triangle J Council of Governments and local Chambers of Commerce are visible partners in this task.
3. CAMPO and its member agencies should increase their support of effective travel reduction measures. (\$1.4 million) CAMPO has allocated \$30,000 per year for the past three years to encourage other, member agencies to undertake new or improved trip reduction programs. Other

considerations should be a county-wide ordinance for major employers and a standing coordinator to help promote and organize efforts CAMPO-wide.

4. Be a partner in, and actively support, the development and maintenance of a “greenprint” of the Capital Area. (CAMPO) A greenprint shows areas or features that are sensitive to new development. Knowing where these locations are, disseminating that information, and then acting to avoid and preserve them creates cost-effective transportation solutions and enhances other agencies’ preservation efforts. The Triangle Land Conservancy is an obvious partner in this effort, having already developed a greenprint showing open spaces, agricultural and forested lands in the Triangle Region. Wake County, Triangle J COG, and local governments will be allowed to participate in this effort. Other additions would be historic sites, low-income and minority communities, stream and wetland features, natural heritage sites, 4-F sites, and parks.
5. CAMPO will support directly station area planning efforts for transit projects that are part of a regional system and otherwise adhere to the recommendations contained in this report. These efforts may include planning, design, right-of-way procurement, and construction of intermodal terminals.



Note: A  indicates that this is a key priority for these recommendations, or that it supports other recommendations.

### *Part III. Recommended Plan.*

Financing shall be worked out in conjunction with procedures for updating the CAMPO annual work program.

6. Working with its local government members, CAMPO will undertake an exercise to better delineate proposed roadways as shown on the existing Thoroughfare Plan. These alignments should consider fair and equal treatment among property owners as well as avoidance of natural areas as identified in the greenprint (see Recommendation #4). The resulting product will be minor adjustments to roadway

alignments that can be justified and match a purpose and need statement for the proposed project.

7. CAMPO, with the help of citizens and community leaders, will serve as a strong advocate to integrate bicycle and pedestrian transportation as an integral component of the region's transportation system. Bicycling and pedestrian travel will serve to seamlessly link pedestrians, bicyclists, mass transportation users and motorists to fulfill their daily travel needs.

### ***FINDINGS AND JUSTIFICATION***

Finding ways of making transportation interact better with local and regional environmental goals helps transportation projects move faster and cheaper while protecting sensitive areas, addressing air quality standards, and enhancing existing and future land preservation efforts. These concepts are supported in the CAMPO goals and objectives, specifically Goal One, Goal Two (D), and Goal Three (C).

Identifying sensitive areas through greenprinting (simply a map of areas that are important to protect, as identified by local governments and citizens) helps avoid problems and reduce costs and project delays. Similarly, defining roadway alignments considering not only topography and parcels but also environmental constraints such as buildings, low-income and




minority communities, churches, cemeteries, schools, parks, wetlands, and natural heritage sites reduces the amount of time it takes to plan and construct a project.

Good growth guidelines are important, but must take into consideration planned transportation system improvements for them to be effective and to prevent conflicts between the two objectives. As the municipalities in CAMPO become more interested in various growth management strategies to help pay for infrastructure, link growth policies to the provision of public services, and shape their communities to facilitate various modes of travel, create character, and limit the costs associated with sprawl, the Capital Area MPO should be a partner to help ensure that regional initiatives are addressed.



Note: A  indicates that this is a key priority for these recommendations, or that it supports other recommendations.

**CAMPO STRUCTURE AND PROGRAM** *The Capital Area Metropolitan Planning Organization has been in existence since 1964, but has seen its most rapid growth in the last decade not only in size but in responsibilities and expectations. This has put increasing pressure on staff, the Lead Planning Agency (City of Raleigh), and limited financial resources to carry out those programs needed at the local level to support regional planning or otherwise required by Federal regulations. The following recommendations work to address some of these issues and to coordinate better with our sister MPO to the west.*

-  1. Recognize the Post-2025 roadway component of the Long-Range Transportation Plan as the official, adopted Thoroughfare Plan for the Capital Area. Projects from the existing CAMPO Thoroughfare Plan map should carry over to the post-2025 Transportation Plan. Also, long-term transit, bicycle/pedestrian, and other transportation projects shall be shown in this part of the LRTP.
  2. Support innovative education initiatives in the annual work program. Proposals that educate the public about alternative choices to make travel easier will be considered on the basis of their perceived market penetration, sustainability, and cost-effectiveness. Innovative and cost-effective bicycle, pedestrian, and driver safety efforts should also be directly supported in the work program.
  -  3. Undertake an organizational study of CAMPO in FY2004. Growing pains, changing federal rules, and higher expectations for regional planning efforts are prompting this recommendation. A mission statement, set of functions, and appropriate agency structure should be formulated to fit the foreseen needs of the Capital Area MPO and its members. Enhanced regional cooperation with the DCHC MPO should also be considered in this study, with levels of partnership that may include a merger of the two MPOs.
- Other significant cooperative actions may include undertaking joint projects such as corridor studies and regional modeling (already well-established), forming a joint oversight board of the officers of each MPO to help direct agenda items, and sponsoring a forum with Triangle J COG every two years to note progress and needs in transportation, crime, education, water/sewer infrastructure, and development. The best use of available funding, member participation, and staff location and size should all be reexamined by an outside firm contracted by CAMPO.
-  4. Provide modeling services to communities on an as-needed basis for local plan updates. The existing travel demand model is difficult and complicated to use, so making it available to help guide land use decisions should be one of the tasks of the MPO. More complicated and in-depth analyses (e.g., comprehensive plan updates) may need to be independently contracted by a separate agency. Assistance may be provided on a staff availability basis; those agencies that identify this need during the creation of the work program can expect to receive priority assistance.



**FINDINGS AND JUSTIFICATION**

The N.C. General Assembly took a big legislative step in 2000 to clarify the confusing relationship between the state-mandated Thoroughfare Plan requirements (NCGS §136-66.2) and the federally-mandated metropolitan transportation plan (23 USC §450.316). CAMPO proposes turning the Thoroughfare Plan map into the post-2025 “vision” element of the LRTP, effectively creating a long-term vision of not only roadways contained in the existing Thoroughfare Plan but also for transit, bicycle and pedestrian projects. Members would still have the opportunity to amend the plan annually, and have major updates every three years to consider more significant changes. In addition, each member should have the opportunity during the same time frame to propose demographic changes that will be incorporated into the Triangle Regional Travel Demand Model, and that would become a part of the official demographic forecasts for CAMPO. The long-term goal would be to have a fully dynamic demographic update system that would eliminate the need to perform time consuming and costly demographic updates at infrequent intervals.

New and more stringent Federal and state requirements, rapid expansion in the 1990’s and new programs made possible by the use of STP-DA funds are all pressing the MPO to reexamine its role and functions. Staffing and funding recommendations should be products of this exercise. Since the City of Raleigh has been “carrying the weight” of providing the local match on federal funds for most of CAMPO’s programs, redistributing this responsibility more equitably should also be considered in this study.

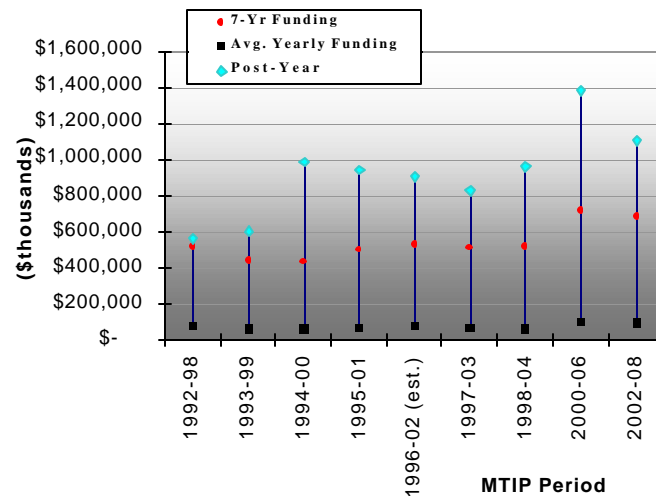
Encouraging more regional cooperation with our neighboring MPO will provide the benefits of a coordinated planning approach without the real and perceived loss of authority of any member in either MPO. This is an item our public noted in the Intermodal Team exercises (a citizens’ advisory committee). Further advances, with the pinnacle being a full merger of both MPOs, may be considered at the boards’ direction.



## Part IV. Revenues.

As a result of Federal transportation authorization bills passed in the 1990's, the Capital Area MPO is required to develop a financial plan component of the transportation plan to demonstrate the consistency of proposed transportation investments with already available and projected revenue sources. Because the Capital Area MPO is designated as an air quality maintenance area for carbon monoxide and non-attainment for ozone, the financial plan needs to address the specific financial strategies required to ensure the implementation of projects and programs to reach air quality compliance. Several components of the financial plan are presented in addition to those required aspects, including:

- Funding will be broken out by horizon year and major



**MTIP Funding, 1992-2002.** (Year 2000 dollars; transit not shown)

source: CAMPO Metropolitan TIPs.

category;

- Possible areas of funding shortfall have been quantified, if possible;
- Operations and maintenance funding have been broken out separately from capital expenditures; and
- Alternative, non-traditional sources of revenue have been reprinted, adjusted to reflect year 2000 dollars and conditions, and summarized. The Capital Area MPO has not made significant progress on these alternative revenue schemes since the last plan update, although some additional bond referendums and increased impact fees (Cary) are reflected herein. Some discussion on the work of the Regional Transportation Alliance's in this area is discussed herein.

The revenues contained in this report are available for use in projects and programs in the transportation plan, which identifies costs and compares these to the revenue streams developed herein. In this way, components of the long-range transportation plan can be updated independently as needed. Where possible, CAMPO has noted funding restrictions on certain revenue streams; for example, Capital Improvement Program funds should be matched to that municipalities' road projects.

The contents and framework of this report are based on federal rulemaking and guidance received in part during previous triennial certification reviews. Substantial input from local jurisdictions was used in the projection of local revenues, just as the NCDOT Division Five Office was instrumental in providing CAMPO with recent maintenance costs, by year.

## Part IV. Revenues.

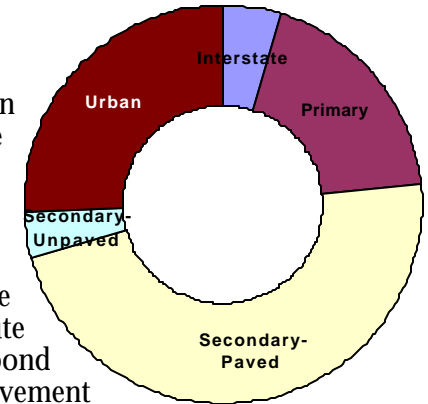
### Historical Trends.

Handling transportation needs in North Carolina has traditionally fallen on the shoulders of roadway construction. Even limiting consideration of transportation needs to this component, capital costs are well in excess of Federal, state and local revenues, and therefore the need exists to assess the funding shortage and explore financing options. The approval of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) encouraged innovative solutions to the transportation challenges. The Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21) continued this emphasis by stating in Section 1203 (Metropolitan Planning) Part (g) that the metropolitan planning organization should prepare:

*“A financial plan that demonstrates how the adopted long-range transportation plan can be implemented, indicates resources from public and private sources that are reasonably expected to be made available to carry out the plan, and recommends any additional financing strategies for needed projects and programs. The financial plan may include, for illustrative purposes, additional projects that would be included in the adopted long-range transportation plan if reasonable additional resources beyond those identified in the financial plan were available. For the purpose of developing the long-range transportation plan, the metropolitan planning organization and State shall cooperatively develop estimates of funds that will be available to support plan implementation.”*

The Lead Planning Agency (LPA) is responsible for collecting the data necessary to complete the financial plan. The appropriate division staffs within the North Carolina

Department of Transportation (NCDOT) will have the chance to review and comment on the methodology and assumptions inherent in this report, pursuant to federal regulations. Local jurisdictions that can be reasonably expected to contribute to revenue streams through bond programs, capital improvement programs, or developer/impact fees will be surveyed to determine the extent of their revenue participation. The Technical Coordination Committee (TCC) and Transportation Advisory Committee (TAC) will review and approve this report.



source: NCDOT Division Five, 11/01

The Financial Constraint Plan will be reviewed and updated in conjunction with long-range transportation plan updates. This can be expected to occur every three years, at a minimum.

Fiscal Year	7-Yr Funding	Avg. Yearly Funding	Post-Year
1992-98	\$ 518,561	\$ 74,080	\$ 563,369
1993-99	441,921	63,131	608,598
1994-00	431,845	61,692	989,172
1995-01	497,976	71,139	941,538
1996-02 (est.)	528,605	75,515	907,727
1997-03	507,423	67,179	831,786
1998-04	516,817	64,544	963,326
2000-06	718,895	102,699	1,379,810
2002-08	679,932	97,133	1,106,973

### 10. Historic Funding Levels, Federal/State (State TIP)<sup>1</sup>.

(source: Metropolitan TIPs. Transit funding not shown; constant year 2000 dollars.)

### Part IV. Revenues.

The Metropolitan Transportation Improvement Program (MTIP) is currently a seven-year program, indicating funding sources (federal, state, and some local), an estimated time frame for implementation of various phases of projects, and project descriptions including costs. The MTIP went to a two-year update cycle beginning in the year 2000. Table 1 summarizes the funding for the current MTIP (FY 2002-2008) and several prior years.

Post-year funding is an indication of the funding necessary to complete projects which are included in the MTIP, but are not expected to be completed within its seven-year horizon. Figures 9 and 10 show the relationship between the funding level received, the seven-year funding allotment, and the post-year “needs” for MTIPs created in the last ten years. It can be readily seen that the post-year needs made a radical increase in 1993, and have not decreased significantly until 2002. A part of the reason for this is that many project cost estimates underwent radical changes during the 2000-2006 MTIP, including adjustments for compounding inflation. Several projects showed large cost increases due to rising right-of-way acquisition and construction costs after this re-estimation. The 2002-2008 MTIP reflected additional funding increases to help cover these rising costs, but these were generally restricted to a few major projects, such as I-540, NC 55 widening projects, and the US 64/Knightdale Bypass.

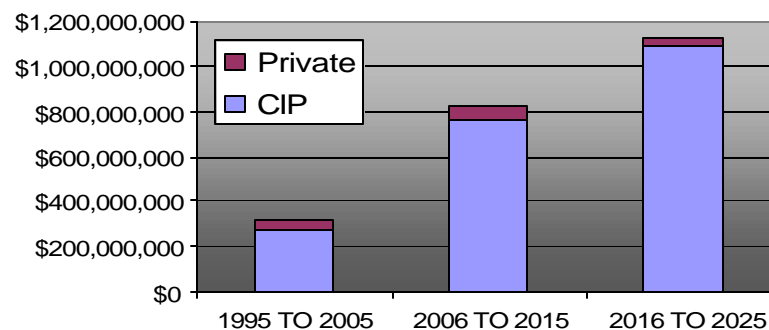
Several factors will contribute to higher future funding levels for the CAMPO area. Because of the funding increases at the federal level associated with North Carolina becoming less of a “donor” state in terms of federal transportation funding contribution, and because funding authorization increased overall as a part of TEA-21, the projected revenues will be higher than in previous years for the federal funding

	Private	CIP	Powell Bill
<b>TOTALS</b>	<b>\$169,956,839</b>	<b>\$2,125,817,941</b>	<b>\$398,068,667</b>
<b>Annual Avg.</b>	<b>\$5,330,747</b>	<b>\$81,762,229</b>	<b>\$15,310,333</b>
<b>1995 TO 2005</b>	<b>\$41,189,523</b>	<b>\$274,755,995</b>	<b>\$85,840,573</b>
<b>2006 TO 2015</b>	<b>\$55,329,210</b>	<b>\$766,546,932</b>	<b>\$151,534,176</b>
<b>2016 TO 2025</b>	<b>\$42,080,692</b>	<b>\$1,084,515,014</b>	<b>\$156,878,114</b>

#### 11. Private and Local (Municipal) Revenues.

component. As population and VMT increase (the latter 60% faster than the former) throughout Wake County, revenues from the state gasoline tax will increase, although this will be somewhat offset by increased fuel efficiency in the vehicle fleet. A great majority of these forecasted funds will be needed to continue projects already in progress.

These sources of transportation revenue derive from local jurisdictions levying taxes, usually on property, their citizens,



#### 12. Local and Private Capital Investment.

and businesses. Other revenue sources for municipal governments may consist of transportation impact fees or

## Part IV. Revenues.

traffic mitigation construction actions (e.g., the construction of a left turn lane at a nearby intersection or a deceleration lane into the driveway of a development). Occasionally, bond referendums are proposed to pay for major improvements to the transportation system. These improvements may be important to the continued commercial growth or traffic mobility of a smaller area within a municipal boundary, but are not usually a high priority when considered from a regional perspective. The local jurisdiction letting the bond often attempts to “package” several such improvements into a single issuance, thereby increasing the base of public support among its citizens, who must vote to approve the bond proposal. Tracking these bond issuances is not difficult, but predicting when such an issuance will occur and what the bond amount will be is impossible with any degree of accuracy. Therefore, an annual projection was not deemed to be desirable. Instead, projecting the total dollar amounts in these categories for each of the three plan horizon years (2005, 2015, and 2025) was thought to be a better overall indicator, one that did not give a false impression of the accuracy of these projections.

As problematic as projecting local funding sources may be, an even more challenging set of circumstances faces the agency that attempts to project where, when, and how much private financing is available for road improvements. Although joint public-private ventures are not uncommon in North Carolina, these are scattered and occur at schedules dependent on variable economic forces, land owner decisions, and local zoning and site development practices. It is also common to require a potential developer to install roadway and pedestrian improvements as a part of a proposed new or expanded development. Again, individual improvements are relatively

small, such as signal and sidewalk installations or deceleration lanes. To ensure that private funding is – conservatively – accounted for, and to apply a geographic dimension to this funding component, it was assumed here that the best indicator of private financing is growth in employment and residential units in a particular area. For every 50 employees or 100 housing units, \$20,000 is added to the revenue stream. This figure is consistent with costs associated with making the types of improvements described above. CAMPO’s own socio-demographic forecasts were used for this effort.

### Alternative Funding Sources

As stated earlier, sources of revenue that are not derived from federal or state sources are described in this report. The private consulting firm of Parsons, Brinckerhoff, Quade, and Douglas was contracted for this purpose in 1999, and KPMG was subconsulted on the project.

These consultants examined the following possible sources of alternative revenues:

#### NEW DEDICATED FUNDING SOURCES

- Sales and Use Tax
- Property Tax
- Occupancy Tax
- Rental Car Tax
- Vehicle Title Tax
- Motor Fuels Retail Sales Tax

#### PRIVATE SECTOR PARTNERING—JOINT DEVELOPMENT AND BENEFIT CAPTURE

- Leasing/Selling Land or Facilities



*Part IV. Revenues.*

- Special Benefit Assessment Districts
- Cost Sharing

## TRANSPORTATION-BASED REVENUE SOURCES

- Toll Facilities and Congestion Pricing
- Shadow Tolls

The forecasted revenues for each of the six dedicated revenue sources are presented on the next page. Revenues are in constant year 2001 dollars.

According to Figure 13, an increase in the retail sales tax provides for a strong and stable revenue source that grows with the economy over time. The revenue potential from an occupancy tax and/or a rental car tax is more limited. However, Wake County does enjoy a captured rental car consumer market because of the location of the Raleigh-Durham Airport, and this tax would export the burden of the tax to visitors that are using Wake County transportation facilities. This revenue source has

markedly increased its productivity since KPMG finished its report. A county-level vehicle title transfer tax has strong revenue potential, and would be in addition to the existing State Highway Use Tax. This creates the incentive, however, for truck and car owners (especially businesses) to register their vehicles in border counties, thus eroding part of the tax base. An increased annual vehicle registration fee has limited revenue potential and, as a unit tax, does not keep pace with inflation (the fee would have to be increased periodically). The extension of a retail sales tax to include motor fuels has moderate revenue potential, depending on the incremental tax rate. Although fuel prices have fluctuated since this report was released in 1999, a 1-5 cent per gallon increase, for instance, would most likely not push the “critical threshold” that moves consumers to look elsewhere for the same product. Such an increase may disproportionately affect lower income workers and their families, who would be least able to absorb an increase in fuel prices (and some increase in commodities due to higher shipping costs). A property tax, as always, has very strong revenue potential, but bears the least direct relationship to transportation use relative to the other potential revenue vehicles.



## Part IV. Revenues.

In addition to a dedicated revenue source, project specific financing approaches must be considered within any specific financing plan. When benefits from a transportation improvement are well defined, a benefit assessment district may be created in order to recapture some of the initial investment. With a benefit assessment district, a formal agreement is reached and private participants openly agree to be taxed in order to finance a specific transportation investment that will benefit them. When transportation improvements to an existing corridor lead to substantial travel time savings, then tolling strategies should be considered, as well as less common congestion pricing techniques involving High Occupancy Toll lanes.

Dedicated funding sources are, of course, the most desirable funding sources in that they provide a stable and reliable source of revenue over a determined period of time. This allows for more comprehensive planning, and can accelerate project completion as the dedicated revenue stream provides security which can be bonded against, thereby accelerating an agency's cash flow. Private sector partnering and transportation-based revenue sources should be considered in the context of a specific project. When considering these project specific approaches, it is important to determine the economic benefits produced by a specific investment, and to identify the beneficiaries so that some form of benefit capture, whether it be tolling strategies or a benefit assessment district can be assessed in terms of its feasibility. While each financing mechanism should be considered on an independent basis, a successful financing plan may incorporate many of the above-listed financing techniques.

	Baseline Year 2001		
	1/2 cent tax	1 cent tax	2 cent tax
Sales Tax	42,797,994	85,595,988	171,191,976
Occupancy Tax	788,082	1,576,050	3,152,100
Rental Car Tax	362,064	724,128	1,448,370
Vehicle Title Transfer Tax	5,285,952	10,603,596	21,207,306
Motor Fuels Retail Sales Tax	1,049,028	2,097,942	4,195,884
	Baseline Year 2001		
	1 cent	5 cents	10 cents
Property Tax	3,827,436	19,137,066	38,274,132
	Baseline Year 2001		
	1 dollar	3 dollars	5 dollars
Vehicle Registration Fee	519,612	2,698,836	2,598,060
	Forecast Year 2005		
	1/2 cent tax	1 cent tax	2 cent tax
Sales Tax	60,548,700	121,097,300	242,194,700
Occupancy Tax	1,063,000	2,126,000	4,252,000
Rental Car Tax	500,600	1,001,300	2,002,600
Vehicle Title Transfer Tax	7,179,400	14,402,000	28,804,000
Motor Fuels Retail Sales Tax	1,303,100	2,606,300	5,212,500
	Forecast Year 2005		
	1 cent	5 cents	10 cents
Property Tax	5,186,200	25,931,100	51,862,100
	Baseline Year 2005		
	1 dollar	3 dollars	5 dollars
Vehicle Registration Fee	573,100	1,719,400	2,865,700
	Forecast Year 2015		
	1/2 cent tax	1 cent tax	2 cent tax
Sales Tax	104,161,800	208,323,600	416,647,200
Occupancy Tax	2,108,000	4,216,100	8,432,200
Rental Car Tax	1,020,300	2,040,600	4,081,100
Vehicle Title Transfer Tax	13,671,800	27,426,000	54,851,900
Motor Fuels Retail Sales Tax	2,138,900	4,277,800	8,555,600
	Forecast Year 2015		
	1 cent	5 cents	10 cents
Property Tax	10,016,700	50,083,400	100,166,700
	Baseline Year 2015		
	1 dollar	3 dollars	5 dollars
Vehicle Registration Fee	774,500	2,323,600	3,872,600
	Forecast Year 2025		
	1/2 cent tax	1 cent tax	2 cent tax
Sales Tax	162,111,500	324,223,000	648,446,000
Occupancy Tax	3,976,600	7,953,100	15,906,300
Rental Car Tax	2,169,300	4,338,500	8,677,100
Vehicle Title Transfer Tax	25,842,500	51,840,700	103,681,500
Motor Fuels Retail Sales Tax	3,623,800	7,247,600	14,495,200
	Forecast Year 2025		
	1 cent	5 cents	10 cents
Property Tax	18,920,100	94,600,400	189,200,700
	Baseline Year 2025		
	1 dollar	3 dollars	5 dollars
Vehicle Registration Fee	992,700	2,978,100	4,963,400

### 13. CAMPO Revenues, Year 2001 Dollars.



## Part IV. Revenues.

The Regional Transportation Alliance, a group of business leaders and elected officials organized by the Greater Raleigh Chamber of Commerce, has also recently performed a financial analysis of the transportation system and needs in 2025. Their initial report indicated that an additional \$10.1 billion dollars would be needed to maintain current levels of traffic congestion and delay in 2025 while still increasing travel choices for the region's residents. The report was signed by the then-mayors of Chapel Hill, Durham, Raleigh, and Cary. CAMPO subsequently endorsed the findings of this report May of 2001. While several towns and cities in CAMPO (Raleigh, Cary, Knightdale, and Rolesville) have enabling legislation to exact traffic impact fees, other municipalities are still pursuing the enabling legislation from the State General Assembly to have this funding option. CAMPO has supported equitable and well-crafted impact fee mechanisms in the recent past (1997). Additional recommended revenue generating mechanisms are shown in the "Financing" section of Part III.

### Forecasted Resources

Figure 14 (above right) summarizes the trend forecast, which was created based upon (1) past trends, (2) current funding authorizations, and (3) conversations with state and local budget offices.

The first note is that, although the table indicates that over \$6 billion in revenue are available from 2002 to 2025, not all funds

	1995-2005	2006-2015	2016-2025	2002-2025
<b>Roadways</b>				
<b>Capital- Local</b>	\$ 274,756	\$ 766,547	\$ 1,084,515	\$ 1,933,489
<b>Capital - Federal/State</b>	1,069,429	1,385,265	1,286,042	2,992,135
<b>O&amp;M (1)</b>	108,816	172,243	174,323	379,211
<b>Transit</b>				
<b>Local Capital (2)</b>	39,993	71,133	69,921	153,052
<b>Local O&amp;M (2)</b>	124,043	138,523	120,305	296,041
<b>Regional Transit (3)</b>	136,848	262,136	251,325	554,515
<b>Private Revenues (4)</b>	41,190	55,329	42,081	109,767
<b>Bicycle/Pedestrian (5)</b>	24,103	39,435	44,067	90,733
<b>Total O &amp; M</b>	\$ 232,859	\$ 310,766	\$ 294,628	\$ 675,252
<b>Total Capital</b>	\$ 1,562,215	\$ 2,540,410	\$ 2,733,884	\$ 5,742,958
<b>Total, All Revenues (6)</b>	\$ 1,795,074	\$ 2,851,176	\$ 3,028,512	\$ 6,418,210

14. Forecasted Revenues, 2025 (Constant Year 2000 dollars, in \$1,000s).

can be used for all types of projects. For example, Powell Bill funds can only be used for the local maintenance and sidewalk construction on state-system streets.

The second note is that "new start" funding is not shown, which will be relied upon heavily to fund the TTA Phase I Regional Rail project, as well as other capital expenditures related to new transit services.

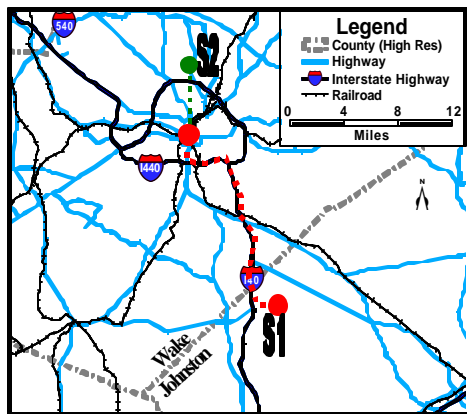
The final comment is that these forecasts (like most forecasts) are largely based upon projections from past trends. Since the last four years saw a marked upswing in both Federal/state and local revenues based on higher MTIP funding and bond releases in Cary, Garner, and Raleigh, the forecasts are considerably higher in these areas than they were in the last forecast (1999). It is important that we continue to monitor our revenues carefully with each plan update to ensure that these trends are not "false images."



It is important that at the end of each plan update cycle, the staff and the boards can identify additional issues that may play a role in the success of our plan. The following are recognized as issues that will play a more significant role in the successful implementation of our transportation plans.

### 1. Housing and Job Distributions Across the Region.

Affordable housing is increasingly being recognized across the country as a major player in the implementation of economic goals. Additionally, this is an issue in transportation, since the location of affordable (here suggested as being defined as less than the median home price) affects the location of workers, commute distances, and travel choices. Note the example below of two different trips with the same ending point. Similarly, the location of high-quality jobs inside of built corridors but located in the north, south, and eastern parts of the county can also accommodate reverse flows of traffic.



#### Trip S1: Benson to Raleigh CBD

27 miles at 52 mph = 32 mins.

##### Emissions:

CO = 468 grams  
NOx = 37 grams  
VOC = 9.4 grams

#### Trip S2: N. Raleigh to Raleigh CBD

7 miles at 28 mph = 15 mins.

##### Emissions:

CO = 91.0 grams (-81%)  
NOx = 9.6 grams (-74%)  
VOC = 2.6 grams (-72%)

### 15. Effects of Residential Relocation on Commute Trip.

Source: NCDOT for emissions estimates of 1991 passenger car.

### 2. Regional Cooperation to Achieve Economic and Transportation Goals.

This plan takes steps to help ensure the viability of local economies through a more localized set of improvements that can be constructed faster. Much of our traffic and transportation issues cross municipal boundaries, through Research Triangle Park and the RDU Airport, and into adjacent counties. Only by considering new private development and public infrastructure in conjunction with local objectives can these issues be fully addressed. We cite as an example the progress that the Piedmont Region (4 MPOs) is making in developing its Transit-Land Use Plan, as well as the regional agency formed in the Triad Region (3 MPOs) several years ago.

### 3. Planning and Process.

The Capital Area MPO needs to consider several improvements in its design and relationship with its members, part of which can be addressed in the organization study recommended herein. Some of the ways to improve efficiency and quality are Start earlier with transportation plan updates, and provide annual opportunities for minor updates (i.e., adjustments that do not trigger a new air quality conformity determination).

- Keep public involvement active between plan updates.
- Update the cost estimation spreadsheet with new linear costs and additional cross-section types.
- Integrate the Project Priority List process with the update of the Long-Range Transportation Plan update. Due to a (slight) mismatch in schedules, this was not able to be completely done this cycle, although priorities were considered in the transportation plan recommendations.
- Demographic forecasting is difficult, but can be made easier and more timely if base year data is updated more frequently and outside of plan update cycles.

## List of Appendices

This set of technical appendices to the *Transportation Plan Update 2025* report is available upon request; a charge for copying may be assessed. Single copies can be provided at no charge in electronic format (CD-ROM).

### a. List of Priority Transportation Projects

Transportation projects are shown with “from” and “to” cross-streets, lengths, number of lanes, funding source, and estimated cost. These projects were produced by our local member agencies and the Capital Area MPO boards through several district and regional meetings, examination of modeling results, peer review input, and public information received throughout the planning process.

### b. Summary of Expert Peer Review Panel Comments

The Expert Peer Review Panel met in June, 2001 to discuss the performance of the original 10 options, as described in the *Options Analysis Report v.4.1*. The Panel consisted of six out-of-state and seven in-state professionals in the fields of transportation mobility, safety, economics, water quality, air quality, and open space preservation (see pages 14-15 for details on these people). This appendix is the summary “minutes” from the Expert Peer Review Panel’s day-long work session. Text boxes help guide the reader to specific areas of interest.

### c. Additional Resources Through the Internet

The Internet can be a tremendous source of information about transportation generally, as well as specific content like HOV lanes, travel demand management, parking practices, light rail systems, and so forth. Listed here are a few of the sites that staff recommends to get started, but there are other sites that our staff can direct you towards if you have a special interest area you would like to explore.

### d. How We Compare to Other Places

To help our Expert Peer Review Panel (see Appendix b, above) get acquainted with our urban area, staff prepared these comparisons of our climate, mobility, economic strengths, etc. with those of other metropolitan areas across the United States. This information is reproduced here from the *Options Analysis Report v.4.1*.

### e. More Maps

These maps were used to help assess environmental impacts and describe forecasted population and economic densities for our area.

### f. How the Travel Demand Model Works

Although frequently used in the transportation planning profession, travel demand modeling is not easy to understand. This appendix has a layperson’s description of our regional travel model, which is capable of forecasting traffic volumes on roads and transit facilities.

### g. How We Forecast Future Funds

Since the Capital Area MPO is required to forecast revenues through the 2025 horizon of its long-range transportation plan, and since our project costs cannot exceed those revenue projections, understanding how these figures are produced is important. CAMPO has received considerable interest in how we do our forecasts, which include inflation adjustment factors; local, private, and federal/state forecasts; and operations/maintenance estimates for new facilities or services.

### h. Public Involvement Report

CAMPO has substantially increased the importance that the public plays in our transportation planning process. This extends from the development of our Mission Statement, Goals, and Objectives (see page 9) all the way to providing input on specific project recommendations. Although CAMPO relies considerably on our local government agencies to acquire public input, we also adopt a Public Involvement Policy that describes public outreach that we undertake on our own. You can contact the Capital Area MPO for a copy of this policy, how you can get CAMPO to come to your group to give a presentation, and for more information on how you can contribute to the ongoing discussion about our future in transportation. This appendix shows the written comments, public outreach and responses to all the comments that we received.

*Part V. Appendices.*





Segment Identifier	Facility Name	Segment From	Segment To	Length (miles)	2025 Plan	Current Lanes	Future Lanes	TIP I.D.	Remaining Cost	Municipality	Year	Funding Source	Regionally Significant
Freeway Projects													
F1	I-540 (Northern Wake Expressway)	NC 55 (Morrisville)	US 64 (Knightdale)	29	Y	4	6	R-2000	215350000	Raleigh/Wake Co	2005	F/S	Y
F17	US 64/Knightdale Bypass	I-440	Rolesville Road	10.2	Y	0	6	R-2547	179650000	Wake Co/NCDOT	2005	F/S	Y
F10	I-40 Widening	US 1/64	Wade Avenue	3.5	N	4	6	U-2719	77300000	Wake County	2015	F/S	Y
F16	I-440	I-40/US 1-64	Wade Avenue	4.3	Y	4	6	NA	117275000	Raleigh	2015	F/S	Y
F2	I-540 (Eastern Wake Expressway)	US 64	US 64 Bypass	2.1	Y	0	6	R-2641	53000000	Raleigh/Wake Co	2015	F/S	Y
F4	I-540 (Western Wake Expressway)	NC 55 (Morrisville)	NC 55 Bypass	10	Y	0	6	R-2635A	254000000	Raleigh/Wake Co	2015	F/S	Y
F8	US 70 (Clayton) Bypass	I-40 (South)	US 70 Business	9.5	Y	0	4	R-2552	34463500	Clayton	2015	F/S	Y
F9	US 1 - 64	US 64	Walnut Street	2.6	Y	4	6	U-3101	20700000	Cary/Wake Co.	2015	F/S	Y
F12	Triangle Parkway	I-540	NC 147	2.9	N	0	6	NA	76449578.4	Morrisville	2025	F/S	Y
F13	Triangle Parkway (south of I-540)	I-540	McCrimmon Pkwy	4.4	N	0	4	NA	106118040	Morrisville	2025	F/S	Exempt
F3	I-540 (Eastern Wake Expressway)	I-40 (South)	US 64 Bypass	10.8	Y	0	6	R-2829	148500000	Raleigh/Wake Co	2025	F/S	Y
F5	I-540 (Southern Wake Expressway)	NC 55 Bypass	US 401 (South)	7.8	Y	0	6	R-2721	216593208	Wake Co	2025	F/S	Y
F6	I-540 (Southern Wake Expressway)	US 401 (South)	I-40 (South)	8.7	Y	0	6	R-2828	147232116	Wake Co	2025	F/S	Y
F11	US 1 (Upgrade to Freeway)	I-540	NC 98	7.8	N	4	6	NA	vision	Raleigh	PY	F/S	Y
F14	Riley Hill-Buffalo Rd. Connector	Buffalo at I-540		7.2	N	0	4	NA	vision	Zeb/Wendell/Knightdale	PY	F/S	Exempt
F15	US 64 West Conversion to Freeway	US 1/64	NC 751	9	N	4	4	NA	vision	NCDOT	PY	F/S	Exempt
				117.1					1646631442				
Segment Identifier	Facility Name	Segment From	Segment To	Length (miles)	2025 Plan	Current Lanes	Future Lanes	TIP I.D.	Cost	Municipality	Year	Funding Source	Regionally Significant
Arterial Projects													
A100	Strickland Road Extension	Westgate Road	East of Leesville Road	2.2	Y	0	2	U-2918	11300000	Raleigh	2005	F/S	No
A102	Edwards Mill Road Extension - part III	Western Blvd	Western Blvd Ext	0.6	Y	0	4	NA	5212836.48	Raleigh	2005	F/S	No
A11	Falls of Neuse Road	Strickland Rd	Raven Ridge Road	1.9	Y	2	5	NA	9574000	Raleigh	2005	L	Y
A12	Falls of Neuse Road	Raven Ridge Rd	Falls of Neuse Blvd	0.6	Y	2	6	NA	12412000	Raleigh	2005	L	Y
A13	Falls of Neuse Boulevard	Falls of Neuse Rd	Capital Blvd	2.1	Y	0	4	NA	15013656	Raleigh	2005	F/S	Y
A17	Highwoods Blvd\Capital Blvd	Highwoods Blvd	I-440	0.6	N	4	5	NA	2500000	Raleigh	2005	L	No
A22	Lake Boone Trail Improvement	I-440	Wycliff Road	0.3	Y	4	5	NA	956000	Raleigh	2005	L	No
A23	Edwards Mill Road Extension	Trinity Road	Duraleigh Road	3.2	Y	0	4	U-2582	13996908	Raleigh	2005	F/S	Y
A233	Walnut Street Extension	Walnut Street	Holly Springs Road	0.8	N	0	6	NA	1500000	Cary	2005	L	Y
A24	Edwards Mill Road Extension - part II	Trinity Road	Chapel Hill Road	1.5	Y	0	5	NA	2500000	Raleigh	2005	L	Y
A28	Davis Drive	Morrisville-Carp	Farm Pond Road	3.9	Y	2	4	NA	7120000	Cary	2005	L	No
A31	NC 54	Trinity Road	Maynard Road	0.8	Y	2	4	U-2908	2550000	Cary	2005	L	No
A32	S.E. Maynard Road	Kildaire Farm	Walnut Street	1.4	Y	2	4	NA	3203000	Cary	2005	L	No
A33	S.W. Maynard Road	Walnut Street	Chatham Street	1.2	Y	2	4	NA	4982796	Cary	2005	F/S	No
A34	Cary Parkway	Evans Road	Harrison Avenue	1.3	Y	2	4	NA	5400000	Cary	2005	L	No
A38	Tryon Road	Walnut Street	Cary Pkwy	1.4	Y	2	4	NA	4475000	Cary	2005	L	No
A39	Tryon Road	Cary Pkwy	Keisler Drive	0.8	Y	2	6	NA	4200000	Cary	2005	L	No
A4	Rogers Lane Extension	Rogers Lane	New Hope Road	1.38	Y	0	2	U-2547	3000000	Raleigh	2005	L	No
A43	Lake Wheeler Road	I-40/I-440	Tryon Road	1.3	Y	2	3	NA	3550000	Raleigh	2005	L	No
A45	Tryon Road	Dillard Drive	Lake Wheeler Road	2.3	Y	2	5	NA	7765000	Raleigh	2005	L	No
A48	New Hope Road	Willow Oak	Buffalo Road	1.7	Y	0	4	NA	2190720	Raleigh	2005	F/S	No
A53	Davis Drive	Morrisville-Carp	NC 54 (Durham County)	5.7	Y	2	4	U-4026	17850000	Cary	2005	F/S; L; P	No
A54	Pleasant Valley Road	Duraleigh Road	Glenwood Avenue	0.3	N	2	4	NA	2458000	Raleigh	2005	L	No
A55	Perry Creek Road	US 1	US 401	1.6	N	2	5	NA	656000	Raleigh	2005	L	No
A56	NC 98 Bypass	SR 1923	SR2053	4.7	Y	0	4	R-2809	49766000	Wake Forest	2005	F/S	No
A60	Holly Springs Bypass	NC 55	NC 55	5.2	Y	0	4	NA	0	Holly Springs	2005	F/S	No
A62	Skycrest Drive	Trawick Rd	New Hope Road	0.7	N	0	3	NA	2874000	Raleigh	2005	F/S	No
A68	Holly Springs Road	Tryon Road	Cary Parkway	5.6	N	2	6	NA	32613984	Cary	2005	L	No
A7	Leadmine Road	Strickland Rd	Six Forks	0.5	Y	0	5	NA	2632380	Raleigh	2005	L	No
A74	Piney Plains Road	Dillard Drive Ext	Tryon Road	1.1	Y	2	4	NA	3655000	Cary	2005	L	No
A8	Strickland Road	Creedmoor Road	Falls of Neuse	3.4	Y	2	5	NA	5620000	Raleigh	2005	L	No
A85	Leesville Road	Millbrook Road	Lynn Road	0.8	Y	2	5	NA	5019000	Raleigh	2005	L	No
A87	Edwards Mill Road	Blue Ridge Road	KiddsHill Plaza	1.8	Y	2	5	U-2824	0	Raleigh	2005	F/S	No
A89	US 401 Widening	US 1	Ligon Mill Road	4.5	Y	2	6	R-2425	0	Raleigh\NCDOT	2005	F/S	No
A9	Strickland Road	Leesville Road	Creedmoor Road	2.6	Y	2	5	NA	16209000	Raleigh	2005	L	No
A92	NC 55	Bobbitt Road	North of Hughes Street	1.4	Y	2	5	R-2905	0	Apex\Cary\Holl Sprg	2005	F/S	Y
A95	NC 55	Holly Springs Bypass	SR 1108	3.3	Y	2	5	R-2907	7733000	Apex\Cary\Holl Sprg	2005	F/S	No
A1	Southall Road	US 401	Buffaloe Road	3.24	Y	0	5	NA	17247000	Raleigh	2015	L	No
A10	Old Wake Forest Road	Capital Blvd	Litchford Road	1.2	N	2	5	NA	6835000	Raleigh	2015	L	No
A101	US 70	Duraleigh Road	Triangle Drive	3.3	Y	4	6	U-2823	19600000	Raleigh	2015	F/S	Y
A103	High House Road	Davis Drive	Carpenter-Upchurch Road	0.6	Y	2	4	NA	1730000	Cary	2015	L	No
A104	Morrisville Parkway	NC 55	Green Level Road	1.7	N	0	4	NA	12439886.4	Cary	2015	F/S	No
A105	Carpenter-Upchurch Road	High House Rd	Morrisvle Carpentr	1.6	N	2	3	NA	9000000	Cary	2015	L; P	No
A106	Cary Glen Road	Yates Store Road	NC 55	2.7	N	2	4	NA	6850000	Cary	2015	L	No
A107	Carpenter Fire Station Road	NC 55	Green Level-to-Durham Rd	1.6	N	2	4	NA	6500000	Cary	2015	L	No
A109	Green Hope School Road	Green Level Ch	NC 55	1.6	N	0	2	NA	12000000	Cary	2015	L; P	No



This appendix provides a quick overview of how the Capital Area “stacks up” compared to other, similar metropolitan areas across the country. The Expert Peer Review Panel that CAMPO commissioned to help assess its preliminary transportation plan options was held on June 18, 2001. Thirteen experts on economics, air quality, water quality, wetlands, mobility, and safety convened to discuss impacts, ideas, and recommendations based on their extensive experience in these performance areas. The minutes from this meeting are shown on the following pages, but are quite voluminous. Staff suggests that you browse through these minutes for keywords that interest you, or skim through the “tags” that are shown on the right-hand side of the page.

Money Magazine provides an easy-to-use and frequently updated resource for making these kinds of comparisons. The data shown is for a metropolitan statistical area, since most data is readily available for that level of geography. For our area, this includes the urbanized area around and including Raleigh and Durham. Our comparison cities were selected based upon their similarities to the Raleigh-Durham-Chapel Hill metropolitan area: they are in warm climates and usually fast-growing. Charlotte and Greensboro-Winston Salem-High Point are peers that are in North Carolina. A national average for each variable, as well as a Peer Group Average for the 11 comparison cities, is shown to help with understanding the relative score of the Raleigh-Durham-Chapel Hill metropolitan area.

Some of the comparisons use an indexed score. An index is a composite score for either a cost (higher scores are bad), or a quality (higher scores are good). For example, the home utility cost index for Raleigh-Durham-Chapel Hill is 102.5, a little lower – and better – than the national average of 105. The air quality index for Raleigh-Durham-Chapel Hill is 67, a little higher than the national average of 65, which is also good. Essentially, unless the word “cost” is associated with an index, higher scores are better scores for a particular variable.

The first few pages show various charts for different types of variables, like environment, economics, and quality of life. The last page shows a table with all of the data for every variable (including a few that aren’t shown in the charts) for every city.

One last thing: Money Magazine named the Raleigh-Durham-Chapel Hill metropolitan area as the best place to live in the South in 2001.



**CAPITAL AREA METROPOLITAN PLANNING ORGANIZATION  
EXPERT PEER REVIEW PANEL WORK SESSION  
JUNE 18, 2001  
SUMMARY MINUTES**

---

The Expert Peer Review Panel identified by the staff and boards of the Capital Area MPO met on June 18, 2001 at the La Quinta Inn at 1001 Hospitality Court (Airport Boulevard), Research Triangle Park, North Carolina. The following were present:

**Panel Member**

K. Lynn Berry, Community Impact Specialist, FHWA (Atlanta)  
Arun Chatterjee, Instructor, Civil Engineering, Univ. of Tennessee  
Kate Dixon, Executive Director, Triangle Land Conservancy  
Bill Elmendorf, Instructor, Pennsylvania State University  
Bill Finger, Assistant Director, Charlotte-Mecklenburg DOT  
John Hennessy, NCDENR, Division of Water Quality  
David Hyder, Air Quality Specialist, NCDOT  
Ann Lorscheider, Traffic Operations Engineer, NCDOT  
Brian J. Morton, Senior Economist, EC/R Incorporated  
Shari Schafflein, Deputy Director, Environmental Services, Washington State DOT  
Daniel Rathbone, President, DBR & Associates  
Dick Voith, Professional Consultant, Econsult Corporation  
Michael Williams, Vice-President, Karnes Research, Inc.

**Representing**

Environmental Justice  
Safety/Reliability  
Open Space  
Open Space  
Mobility/Accessibility  
Water Quality  
Air Quality  
Safety/Reliability  
Environmental Justice  
Water Quality  
Mobility/Accessibility  
Economics  
Economics

**Others Present**

Anna Brigman, NCDOT Statewide Planning Branch  
David Eggerd, Town of Cary  
Ma'Ayn Johnson, FHWA Southern Resource Center and U.C.-Berkeley  
Carlos Gonzalez, FHWA Internship Program  
Joe Huegy, Triangle Transit Authority  
Edison Johnson, Engineering Department, City of Raleigh  
Felix Nwoko, DCHC Metropolitan Planning Organization  
David Rowland, Planning Department, Town of Apex  
Linda Teal (General Public)  
Don Willis, Wake County Coordinated Human Service Transportation

**Lead Planning Agency Staff**

Elizabeth Harper, Parsons, Brinckerhoff, Quade and Douglas, Inc.  
Scott Lane, CAMPO Staff  
William Summers, CAMPO Staff  
Kenneth Withrow, CAMPO Staff

**Preliminaries and Overview of Agenda**

Mr. Lane convened the workshop at 9:00am. Mr. Lane welcomed the panel members, and especially thanking those that traveled from out-of-state to attend the meeting. He also introduced other staff members and Elizabeth Harper (Parsons Brinckerhoff). Mr. Lane and Ms. Harper asked that each Panelist that wished to receive a honorarium for their participation on the panel complete a form including their Social Security number. He asked those sitting in attendance that were not Panel Members to introduce themselves, and told the Panel Members that they would get a chance to do so later in the agenda.

Mr. Lane continued by explaining changes that have occurred in the MPO and transportation planning process due to increased stakeholder involvement, federal regulatory changes, air quality conformity regulations, and the increased expectations from the public and decision-makers about the quality of the planning process and document. He also explained the purpose of the Expert Peer Review Panel: to gather feedback on our preliminary plan options, to get ideas on how to mitigate negative impacts, and how to enhance the positive aspects of the plan. He stressed that ideas on implementation are important to CAMPO, and that recommendations on specific projects or detailed discussions on projects are not the purpose of the work session or the Expert Peer Review Panel.

Mr. Lane reviewed the agenda (see attached), noting the expectations for each portion of the agenda.

Mr. Lane reviewed some of the preliminary results of the surveys that had been completed and forwarded to him. He noted that most of the Panelists favored one or more land use alternatives. One Panelist suggested that the land use alternatives should also be used in conjunction with the Highway Intensive option, not just the Managed

**Purpose  
and intent  
of Work  
Session**

Lanes and Transit/Rail option, to see what those results would indicate. The transit shares were quite small, and the wetlands figure for the Baseline 2025 option needs to be re-examined. One Panelist asked about bicycle and pedestrian facilities, to which Mr. Lane responded that it seemed to make more sense to formulate a bicycle/pedestrian plan after the larger, “trunk” parts of the transportation system had been determined. Another Panelist suggested that the benefits of Open Space be described in economic terms, not just physical measures (e.g., number of acres). Mr. Lane asked Ken Withrow to start his presentation. Ms. Dixon asked if there was a portion of the agenda dedicated to further explaining the transportation options. Mr. Lane responded that staff would present some further explanation on the options early in the agenda, at 10:00am.

Mr. Withrow showed the *Transportation Plan Update 2025* Phase I video tape. The tape described some of the issues facing the transportation planning community in the Capital Area, and ended by asking for viewers’ input to the transportation plan. Mr. Lane explained that the tape was used to prepare survey respondents for completing a two-page survey, the results of which were then presented by Mr. Lane. He described the personal issues that survey respondents identified: decline in air quality, home to work commute time, stress and fatigue, traffic safety, transportation choices (or the lack thereof), business impact, loss of open space, and bicycle/pedestrian safety. Mr. Morton asked how the transportation choices question was phrased; Mr. Lane responded he couldn’t recall at that time. Mr. Lane did note that all of the concerns exceeded a “3” out of “5” rating scale on a 1-5 scale. The next slide indicated how people wanted to address these problems, with premium transit (18%) and intersection improvements (11%) receiving

**Overview of  
early survey  
responses**

the highest priority, followed by managed lanes/HOV and additional highway capacity. Mr. Lane noted that NCDOT had conducted a survey of people traveling on I-40 and that the responses to a similar question were virtually the same for the top four responses. He said that he felt that this added some validity to the results of this, earlier survey. The next slide indicated the responses received by the public when asked if they had just \$10 to spend on transportation concerns, and only \$3 could be spent in any one area, then how would they allocate their funds? The responses, in order given, were: safety, mobility, environment, reliability, accessibility, and the economy. Mr. Lane noted that although the survey was skewed towards the business sector the economy was the least concern. Ms. Dixon asked what “economy” meant in this survey, with Mr. Lane replying that economy referred to business growth. Dr. Rathbone asked if the questions were open-ended, or were they multiple choice. Mr. Lane responded that they were closed-ended. A brief discussion was held about the reason(s) that economy was ranked last, with several people noting that the historically strong economy has perhaps been taken for granted and therefore was ranked lower by the respondents. Dr. Morton asked if the respondents knew how much money was being spent in these areas before they completed the survey; Mr. Lane replied that they were not provided with that information. Mr. Lane noted that the options that we are considering now are partially a result of the opinions expressed in these surveys, including rail, express transit service, and alternative land use futures. Mr. Lane then introduced Ken Withrow.

Mr. Withrow explained that he would walk people through the transportation options, and v/c maps. He began by introducing people to the locations of universities, Research Triangle Park, and the state government offices in downtown Raleigh. Mr. Voith asked if there was an effort to jointly plan with neighboring communities; Mr. Withrow responded in the affirmative. Mr. Lane explained the uniqueness of the region in that it was truly polycentric and that there was a single dominant center such as one would find in most metropolitan areas.

Dr. Rathbone asked how the employment in the Research Triangle Park compared to that of downtown Raleigh; Mr. Lane responded that while the actual employment numbers may be similar, the median incomes in RTP are substantially higher, focusing on high-technology companies. Mr. Williams explained further the role and magnitude of the RTP employment base. Mr. Withrow indicated where congestion would be occurring in 1995 and 2025 by the use of volume/capacity ratios. Mr. Withrow then indicated where premium transit and major new road facilities were located in each of the transportation plan options. Mr. Lane explained that both the volumes and capacities were for four hours in the morning peak period, and that the 2025 v/c figure represents the congestion conditions after \$7 billion of expenditures. Dr. Rathbone asked why the v/c ratios looked so low when in other plans that he has seen the numbers are usually much higher. Ms. Harper responded by saying that these were four-hour periods and that they were averages where some facilities were experiencing almost no congestion.

Dr. Chatterjee noted that the M3 option was the only one that did not have the completed outer loop (I-540) and asked why that was so. Mr. Lane responded that one option was tested without this expensive facility that would have significant environmental impacts to see what effect that would have on other east-west facilities in this area. Mr. Williams thought that there would be freight impacts and asked if staff thought that those impacts would be important, as well as why there wasn't more traffic using the facility. Mr. Lane responded by noting the distance that the uncongested sections of I-540 were from the congested sections of I-440, and that the number of intraurban trips is fairly high while the number of trips passing all the way through the region isn't as large. Mr. Voith asked if the land use and development numbers were reactive to new transportation facilities; Mr. Lane said that this model was not reactive to those changes and that most models were not. He also explained that when the local planning staffs were asked to produce forecasted demographics, they were told that all TIP

projects should be considered as built in 2025. Dr. Morton indicated that there was no induced traffic effect represented in the model either. Additional discussion indicating that further integration of land use and transportation planning/analysis is needed. When Ms. Schaftlein asked whether the land uses in the model were based on current zoning, Mr. Lane responded that zoning is a component of the forecasts, but is not used exclusively due primarily to the frequent rezonings that occur in the area. Mr. Finger further indicated that it is considered bad form by most developers not to attempt to rezone to a more intensive use; you should always try for something more. Mr. Lane stated that the entire purpose of the five land use options was to simply see how reactive the model was to changes in land use, and that further such testing may be accomplished if the CAMPO boards direct staff to do so.

Mr. Voith noted that the options with the most highways had the lowest vehicle miles of travel (VMT), and wondered why that was so. Mr. Lane suggested that what many people had found was that by shifting more population and jobs into a few corridors, more congestion resulted, requiring people to make longer trips to avoid the congestion. Further, the model did not account for induced traffic effects, the concept that promoting a particular way of travel actually increases the use for that mode of travel. Ms. Dixon asked if she had heard correctly that the M1 option was the most likely transit option to get used; Mr. Lane responded by saying that one transportation option was selected to see how the land use changes would affect a transit-intensive option, since transit is very reliant upon the type and densities of land development. Ms. Dixon and Dr. Morton said that they did understand the differences between M1 and M3. Mr. Withrow stated that the M3 option does not have managed lanes; Mr. Lane noted also that there was more focus on system and demand management on M3. Dr. Morton suggested that a single sheet showing what options were in and what was out would be very helpful. Some additional discussion was held concerning differences between the options. [Note: Ms.

Harper later handed out a sheet describing the differences between the options similar to what Dr. Morton had requested.]

### **Roundtable Discussion of Options**

Mr. Lane asked Mr. Hennessy to begin the roundtable discussion by stating the role he had within his agency and describing his opinions of the plan options thus far, focusing on what he liked best and least.

**John Hennessy** stated that his job is to review and permit projects submitted by NCDOT, and that he has a Master's Degree in Biology from Duke University. He then went on to say that he thought CAMPO was doing a good thing by attempting to integrate transportation planning with land use, something that has been lacking here and probably throughout the nation.

Being from the environmental side, he likes the rail and transit system options the best. Mr. Hennessy said that an internal circulator system is needed within RTP, the primary job creator in the area. Once a person gets to RTP, there is no real way to get around except by car. He stated that he liked H2 (Highway Intensive) the least of any option, since it represents a continuation of what has already taken place, and that what has been done here hasn't worked. Mr. Hennessy talked about the Neuse and Tar-Pamlico river basins and 50' buffer limitations around the streams as well as stormwater requirements already in place. Regulations are in place here that do allow growth and development, and that is something to consider in later discussions.

**Bill Finger** told the panelists about his position as Assistant Director of the Charlotte-Mecklenburg DOT, and that there were no MPO staff in Charlotte. All of the DOT work together to get the work done,

***Each Panelist describes his or her favorite and least favorite aspects of the plan options.***



including a transportation plan update. He stated that, unfortunately, these plan updates tend to focus on what was done the last time and that trends of the past are continued into the future. He graduated from Georgia Tech with a Bachelors Degree in Systems Engineering and a Masters Degree in Transportation Engineering. He has been with the City of Charlotte since 1978 after a six-year stint as a consultant.

Mr. Finger stated that his favorite concept was not represented, and was actually “M2b”, a combination of the M2: Current Trends and Managed Lanes/Rail transportation option and the corridors and nodes land use plan. Charlotte has adopted a similar approach, he continued, stating that transit needs to go somewhere. Parking has been a problem in downtown Charlotte to service all of the office employment that has taken place there. Mr. Finger also stated that he likes options, and that he liked what was shown in the report in that transit is shown as an alternative to congestion, not as a solution to congestion. Why do you pay for cable TV? Because you like to have options as a consumer; transportation works the same way. He believes that we need more mixing of land uses, and that we been for too long stuck on the notion of homogeneous land uses, e.g., retail here, commercial there. Mixed use development is a strong component of smart growth. You want to get connections of the transportation system around the development nodes, even if it is only for pedestrians. In Charlotte, the most congestion-free area is the 50-block area in the center of Charlotte. People live there and work there and wonder why other people complain about congestion, and its because the streets are all connected. The lots could not have been sold any other way, since development had to have access to transit and sidewalks were needed to reach the bus. There was mixed use, because the area was developed prior to zoning. Mr. Finger stated that his mother can drive to the supermarket, to the drugstore, to the branch bank without going through a traffic signal or getting on a major road. Mr. Finger said that she can also reach a library and her church by only going through one signal and still not getting on any major roadway. Those of us who live

in the suburbs, we have to get on a major road to do anything. He continued by saying that data we need to collect about transportation is at a local level, and referenced some recent research by Lawrence Frank, an associate professor at Georgia Tech. Mr. Finger said that he suspects that if we had that data, the houses in that 50-square block area in Charlotte would produce a lot less VMT. He is particularly interested in getting that kind of development around each of these nodes in the Charlotte land use/transit plan. Mr. Finger said that the option he likes the least, even though he is transportation engineer, is H2: Intensive Highway, even though he is a transportation engineer and has been a member of ITE (Institute of Transportation Engineers) since the 1960's. He stated that he does not believe that we can build our way out of congestion, he does believe that what we do with our highway system does have an impact land uses and that land use would end up being more dispersed under that option. He further stated you can't just pick the “b” land use option and expect it to happen, and that the transportation system alone will not make it happen. It takes a whole effort in all of the areas of land use planning in order to bring it about and it has to work for the free market. My favorite would be M2 and “b.”

**Michael Williams** said that he is with Karnes Research Company in Raleigh, which tracks income property markets in the region like office, industrial and retail development as well as the multi-family market. He continued by saying that he feels his role on the Panel is that he does have a pretty good feel about the markets driving these land use investments. Mr. Williams claimed that the transportation system will have a very large affect on these markets and other externalities. There is a lot of focus on Research Triangle Park, not on central Raleigh, west Raleigh, and Durham. This does not have to be this way in the future, as there are significant opportunities for infill development in these areas that could take some of the pressure off providing transportation service to a suburban office park, which RTP is. Mr. Williams stated that, therefore, there should be more focus on connecting current

employment centers in downtown Raleigh, the airport, downtown Durham and Chapel Hill. The second focus should be providing infill development in these areas. He felt that the models that did that the best was M2: Current Trends and Managed Lanes. He said that he is a little wary of the some of the transit lines that go fairly far east near US 64, south on US 401, and the western line that doesn't even go to central Raleigh, which should be the central hub of the system. He would like to see those lines brought in more, and focusing on transit on the really important corridors like I-40 and US 70 and focusing on how that can serve Raleigh. Mr. Williams said that one of the reasons he feels that central Raleigh and Wake County are so important is, using the example of Lucent Technologies that located at Centennial Campus in Raleigh and the intersection of US 1/US 64, is that there is enough of a labor force in Wake County that they wouldn't have to go to RTP. Mr. Williams recognized that it would be very difficult for a CISCO Systems to move out of RTP since they would lose either their Durham or Raleigh workers. He thinks that we can continue to support Research Triangle Park by developing a strategy to promote infill development in Raleigh, Durham, and, to a lesser extent, the Town of Chapel Hill. He thinks that Durham and Raleigh has a more favorable political environment to build at higher densities than does Chapel Hill.

**Ann Lorscheider**, an operations engineer with NCDOT responsible for ITS development. She believes that with either option M3: Intensive Management and Rail or H2: Intensive Highway that we are putting our eggs too much in one basket and that won't work. Ms. Lorscheider likes M2: Current Trends and Update + Managed Lanes/Rail for its flexibility. Challenges with any of these will require operations and conceptual planning about to implement any of these, as well as more marketing than what has been done in the past. In transportation we are being required to change the way we do business because of what is being required of us.

**K. Lynn Berry**, works at Federal Highways (FHWA) in community impact assessment, as well as in Environmental Justice. She started by saying that in reviewing these plans she encountered some of the same frustrations that the public must face in trying to engage in the planning process. She was frustrated by the lack of information, broad horizon, and wanting more to make a cogent decision. In regard to community impacts, particularly impacts to low-income and minority populations, Ms. Berry stated that it was simply impossible to support the H2: Intensive Highway scenario, since it seems to provide virtually no options for those populations. She also said that she wasn't clear on where the low-income and minority populations are in this area, and she assumed that if these populations are in the core area, then it is impossible to put much behind the H2: Intensive Highway option. She is further confused between the differences between M1: Managed Lanes and Transit/Rail System and M2: Current Trends and Update + Managed Lanes/Rail options, so that she would reserve stating her preference until there had been more discussion of those options, but M2 looks a little more balanced in her opinion. Ms. Berry finished by saying that she would provide more comments as the day goes on.

**Daniel Rathbone** is the President of DBR Associates and the editor of the Urban Transportation Monitor for 14 years. His entire 29-year career has been concerned with developing transportation plans and options and that he considers himself fortunate because he enjoys it. He said that this process is fascinating, because of the complications presented by Research Triangle Park. He continued by saying that the area is entering an interesting phase that will determine the development future: will it be in RTP or in downtown Raleigh? Dr. Rathbone stated that he assumes downtown Raleigh is the cultural focal point of this area, and that he thinks that it would not be good if that CBD goes down by not attracting new development. Considering that, he feels that best option is somewhere between M2: Current Trends and Update + Managed Lanes/Rail and M3: Intensive Management and Rail System. The reason for that is concentrating less eggs in one

basket and supporting the downtown Raleigh area. He says that because he feels that downtown Raleigh will become another focal point in time.

**Shari Schaftlein**, a water quality specialist with the Washington State DOT, stated that she won't go into great detail on her survey comments since her comments had already been sent out (by CAMPO staff). She said that in general that M3: Intensive Management and Rail System with an HOV lane was her preferred option. She can't support any transportation system that doesn't have a land use component, so she focused on the first two land use options. That there were land use options to consider shows great progress, and that what she is familiar with in the Pacific northwest biased her in this direction where they already have growth management and major investments already going into things that are in this plan. Where they have run into problems there, and here as well, is where the green infrastructure isn't aligned to the transportation infrastructure. These environmental areas are now providing the limits to transportation and land use, on which it encroaches on a daily basis. Ms. Schaftlein said that, therefore she hopes that dialogue here will address the problem of how can you leapfrog this issue by addressing only the transportation and land use focus without addressing the green infrastructure focus? The GIS data on environmental features needs to be pulled together to address all three areas simultaneously. Is the area willing to make planned, smart growth and getting all three of those areas to align? It can't happen overnight, Ms. Schaftlein said, since there is way too much education that has to take place first, so that success may not be realized by 2025. Its important to lock up those lands and transportation corridors now, since they (in the Pacific Northwest) are finding it virtually impossible to build out our environment, with many more geographic constraints than you have here, to retrofit a new urbanism concept.

**David Hyder** said that he works for the North Carolina Department of Transportation as an air quality engineer. It is his job to ensure that

the transportation system that is decided upon can be moved forward. Mr. Hyder said that his greatest concern is that the emission figures shown for all of the options do not get near the one-hour ozone standard, much less for the 8-hour standard. Mr. Hyder said that this presents a problem for him and for the entire area. Over time, he assumes that new technology will help us out, but that does not remove our desire or need to couple land use and transportation together more closely.

In regard to the options, Mr. Hyder said that he used a pretty mechanistic method to select three preferred options. He said that, surprising to him and what flies in the face of what is becoming conventional wisdom in the air quality business, option H2: Intensive Highway fared very well. He said that he could not recommend that option because he wasn't sure it would be politically palatable and that he isn't sure he would like to live in that world, anyway. M2: Current Trends and Update + Managed Lanes/Rail and M3: Intensive Management and Rail System fared pretty well, although he is not positive of that. Of concern to him, is the state of air quality modeling and that we are not taking into account what happens when and if we start managing land use effectively. Mr. Hyder said that he wants to put in a plug for access management at this time since whatever is put out there is going to be a multi-billion dollar investment, and that it is an investment that we don't want to muck up 10 years after we put it in.

Mr. Lane stated that staff had found an error in the emissions figures that will have the effect of lowering them all, probably close to the budget figure. So, one of the concerns that many people had about the emissions in the land use options will probably go away once this is corrected.

**Kate Dixon** is the Executive Director of a non-profit organization called the Triangle Land Conservancy (TLC) which protects lands and open space in six counties, including Wake County. She has been with

TLC since 1992, and has a Bachelor's Degree in Philosophy and a Master's Degree in Watershed Management from the University of Arizona. Ms. Dixon has said that there has been some talk in this area about combining CAMPO and the DCHC MPO, and that she favors such a merger. Ms. Dixon said that when she thinks about open space preservation, that the antithesis of that is 2-acre lots and that that is the worst thing we can do in this environment to protect open space and to protect the places that are important to us. So the way that TLC is trying to protect open is to identify those places that are most special, and to protect them permanently.

In terms of looking at these options, she was considering the impacts to open space. It was difficult for her to decide between M1: Managed Lanes and Transit/Rail System, M2: Current Trends and Update+Managed Lanes/Rail, and M3: Intensive Management and Rail System since it was hard to see the exact impact. She continued to say that her preference would be the one that had the least amount of impact to increase access in areas that are relatively rural at the moment. Referring to Ms. Schaftlein's comments, Ms Dixon stated that there is interest in developing a green infrastructure plan so that people that are interested in protecting open space can identify those areas that are most significant. Several parties are engaged in this effort, and that it needs to be merged into this effort (Transportation Plan Update 2025) when the timing is right. She stated that she liked the Mixed Use Suburban Employment Centers and the Traditional and Infill Development. She favored increasing density where it already exists and discouraging it elsewhere.

**Dick Voith** is a new principal at Econsult, Inc., where he has been for five days. Prior to joining Econsult, he was an economist at the Philadelphia branch of the Federal Reserve Bank. He said that he likes transit, and that can be counted as a bias to be put on the table. He agreed with Bill Finger, and he likes the M2: Current Trends and Update+Managed Lanes/Rail option coupled with the "b" land use

option. He also liked the neotraditional and infill land use option as well.

Mr. Voith continued by saying that there were a couple of things he would like to state as an outsider to the area. He stated that there has been a long-held belief at large in the world of economics that we spread out when the costs of transportation become low, and that when you spread out, you travel more. It seemed quite clear to him that H2: Intensive Highway would make more travel no matter what, even though in the modeling simulations the VMT does drop for this option. Mr. Voith said that this goes against 100 years' worth of experience in changing transportation investments. Although complimentary of the way the information in the report was laid out, he does not feel that H2: Intensive Highway will perform as advertised. He said the new development moves to the places where you put the new facilities, and that happens pretty fast in modern times. Mr. Voith said that as planners, economists, and decision-makers we need to be aware of trends and changes in those trends. He reiterated that he did not support H2: Intensive Highways simply because he didn't think it would do what the projections indicated. Transit has such low model shares in any of these options, one could ask the question of why invest in transit if you're getting nobody on it. He comes from Philadelphia where mass transit is incredibly important to the life-blood of the city, and that without it the city would implode. He wonders if we can't be competitive with transit because we can't get people on it, or if, over time, there could be transit benefits in land use plans that could make transit competitive? One must always keep market-competitiveness in focus since people have to choose it since that is how people will make their choice. He is interested in learning more about if the modeling that has been done here actually reflects the reality of transit usage.

**Bill Elmendorf** said that he has been an Extension Specialist at the School of Forestry Resources at Pennsylvania State University. His specialty is community forestry and he teaches the same at Penn State.

Before coming to Penn State he was a planner in Ventura County, near Los Angeles County. He has seen a lot of growth, and his interest here is in open space. He sees open space as providing passive recreation opportunities as well as providing a lot of other benefits.

After reviewing the report, he noted that five of the impacts had identical impacts to open space, and he could not well delineate the open space areas. He shares the same opinion with Shari (Schaftelein) that there are not enough overlays on open space to reach reasonable conclusions about open space impacts. He doesn't like H2: Intensive Highways for all the reasons everyone else has said. He has lived in Los Angeles, been to Washington, DC and he doesn't think its ever going to work to solve any transportation problems. Mr. Elmendorf continued by saying that he doesn't approve of the Current Trends models even though they have the lower impacts on open space because he doesn't think they are realistic. He likes the three scenarios that put density in a plan in place, which was the nodes, the infill, and the growth boundaries, the latter of which he brings up more as a discussion item than as a practical solution here, although they have proved to work in other areas like Portland, Oregon. They are looking at growth boundaries in Lancaster County, Pennsylvania. Growth boundaries need cooperation between municipalities and expert planning. Mr. Elmendorf thinks that zoning can work, but it takes a little more attention to a lot of different things. He brings up the issue of growth boundaries because it points out the lack of communication and cooperation between local governments and this is a problem all over the United States, not just here. He thinks that there should be a meeting on open space just like this with all of the time and energy that has been put into this excellent transportation plan. These two important infrastructures could be merged and better decisions could be made for the natural environment. In the discussion of bikeways and pedestrian paths, should also be a discussion of linear greenways that connect different hubs. Basically, he thinks we need more information on the green infrastructure before a final decision can be made.

Mr. Lane said that he appreciates the sentiments that have been expressed already about a lack of information, and that safety matters are perhaps in an even worse position here since those numbers don't exist. Mr. Lane agreed with Mr. Elmendorf about his concept for convening a similar meeting for open space purposes, as well as these other performance areas. Ms. Dixon commented that there has been effort that has begun to look at open space with the Triangle Land Conservancy, the Triangle J Council of Governments, and the N.C. Department of Parks and Recreation have invited experts on open space, greenways, parks, cultural resources, wetlands, and farmland. This group did a huge amount of mapping and documenting to determine where these most sensitive places where. In the next two months the report of their work will come out which will include GIS mapping, which will be real helpful for this effort, too. Mr. Elmendorf wanted to say also that he agreed with Ms. Schaftelein that locking up open space is critical, since more development will make it more and more difficult to obtain and more expensive to purchase. Mr. Hyder noted that the General Assembly did vote on a bill to allocate funds to the preservation of open space, which was approved but not funded. Mr. Finger noted that Charlotte let a bond issue to develop a greenway system, but the money is spent as quickly as it is allocated just to purchase the land, so the voters are getting a little antsy, but they keep on approving the bonds.

**Arun Chatterjee** began by saying that he is an instructor at the University of Tennessee, and that his background is in transportation planning, including experience at NCDOT in the 1960's. He likes everything including transit, highways, and freight and air quality issues.

The option he liked was M2: Current Trends and Update+Managed Lanes/Rail because there is a balance of highways and transit, and he thinks that is one of the main reasons he likes that option. Transit does have a low level of usage in the model, and if that is true then we will

need some highway development. There are no statistics for safety at a network-wide level, although we are looking at developing such a tool that could be used for this purpose one day. From general conception what does improve safety shares some similarities with air quality: less VMT, less accidents, better flow, less stop-and-go traffic improve air quality and safety, too. Dr. Chatterjee said that he was using air quality as a surrogate for safety, and that M2: Current Trends and Update+Managed Lanes/Rail stood up pretty well in that regard. Mr. Finger noted that option would be best for NOx (oxides of nitrogen) since when speeds go back up, NOx goes back up. Freight-wise, Mr. Chatterjee said that this area does not see truck traffic nearly to the degree that exists in Tennessee, but that truck movement should be facilitated to the ports like Morehead City. This is one reason he does not like M3: Intensive Management and Rail System, because he likes complete loops, which may help truck flows, even if the southern part of the loop is only four lanes. Truck traffic needs to be looked at further. In regards to land use, Dr. Chatterjee said that the first two, the nodes and the activity centers, and are good for promoting mixed use.

Mr. Lane noted that every day in the model is a day without accidents, and that these accidents do have a great impact on our mobility and air quality. Mr. Finger commented that when an accident occurs there is an increased chance of a secondary accident, and that conditions will get worse and worse.

**Brian Morton** said that he is an economist and a consultant in Chapel Hill, and that he has been a resident in this area for about 16 years. His primary practice areas are air quality and transportation and as a citizen transportation planner. He was part of a citizens' committee that helped developed the Durham Travel Demand Management requirements. He has also been an active member of the Eno River Association, which has helped develop an alternative to the so-called Eno Drive that has been on the books for some 30-odd years. A state park would be seriously affected by this facility, and a consensus was

reached about their preferred alternative which has been shepherded through the NCDOT evaluation process. He has also been working with universities in England to help them develop an alternative to their highway evaluation process to include traditionally under-represented groups in that country.

Dr. Morton indicated that he looked at NOx emissions from each scenario, since NOx is the major contributor to ground-level smog in this area. He thinks of ozone as a community health issue, since it greatly exacerbates asthma. The incidence of asthma has become alarmingly high among low-income and minority groups, who also have lower access to health care, making them particularly at-risk of adverse human health consequences that ozone causes. He is also interested in low-income and minority status (which he feels are closely correlated in our area) in regards to travel times and gaps between transit and auto travel times. Dr. Morton said that his first choice was the intensive management and rail system (M3), since it minimized emissions of NOx and also did best in terms of improving the mobility of low income groups by transit to multiple destinations compared to the auto. The rate of auto ownership is less among low-income groups, making transit critical to their quality of life and income earning potential. The option he liked least was M1a: Managed Lanes Transit/Rail System with the mixed use/suburban employment center land use, although this may be putting too much faith in the emissions numbers shown, an astounding 94,000 kgs per day for NOx, the greatest of any reported, or 23% increase over the baseline. He did note that in most of the land use options, transit travel times by low-income groups to employment were increasing, which he found disturbing. Dr. Morton also had grave doubts about H2: Intensive Highways, although given the analysis that is reported here his relative dislike is based on more general considerations than the actual reported numbers. He believes that there is a latent demand which increases the amount of travel as more highways are built and lanes are added because the cost of travel is reduced. He therefore feels that the model may be misleading, since it



does not account for these induced travel effects. He doesn't feel that the highway intensive option will work as well as shown, and cited Atlanta as an example of worsening air quality, quality of life and so on, similarly for Los Angeles. Hence, you cannot build your way out of traffic congestion, and that this actually worsens air quality problems, particularly ozone. He noted that the ozone budget is geared towards the one-hour standard, not the eight-hour standard which will be much harder to meet. He sees meeting this NOx emission budget as a real problem for all of the alternatives.

Mr. Lane thanked the Panel for their comments and for pointing out some of the suspicious aspects of the figures. Dr. Morton commented that he calculated the correlation between VMT and the NOx emissions and the correlation is .05, which just isn't credible. Mr. Lane said that staff would be reviewing these figures again before they are widely distributed.

At this point, the Panel broke for lunch.

Mr. Lane asked Mr. Hennessy to start off the conversation about trends that have occurred in North Carolina.

Mr. Hennessy noted that one serious area of concern is that when he permits a project, the alternatives are often overgrown with development compared to the protected alignment for that project. Historically, those protected corridors are at the river bottoms because there was a desire to build on the high land on either side of the road. He said that NCDENR have been working to get away from protecting one corridor. The way that planning is done in North Carolina involves an equitable distribution of funds around the State, and what that means is that he spends a lot of time working on bypasses of small communities of 1,000 people that don't

***Trends  
happening  
in North  
Carolina  
and across  
the country.***

need a bypass, but it takes him an hour to get from his office in Raleigh to his home in Durham. It seems to him, since he drives all around the State, is that congestion is around the urban areas, yet he spends the majority of his time working in rural areas. Mr. Hennessy wondered if this doesn't require a rethinking of the way in which we distribute funds around the State. Mr. Williams asked about how the statewide equity formula works; Mr. Finger responded that each of seven equity districts comprises two NCDOT highway divisions, and that half the money is distributed by equal share, one-fourth by population, and one-fourth by the number of intrastate roadway miles left to be completed. The intrastate system is a list of specific projects, including the Troy Bypass, that must be spent with this money. This is true of everything except the seven urban loops, which have their own funding stream so that they can move as fast as possible. Mr. Hyder further explained that part of the rationale for this bill was the rural-urban makeup of the legislature in 1989, one function of which is that the rural communities were afraid that the urban areas would take up all of the transportation money and that has resulted in a law that doesn't allow Charlotte to help us build roads. Mr. Finger also commented that another aspect of that bill is that any road with more than 50 vehicles/day will be paved, but we have roads carrying 30,000 vehicles/day that can't be widened due to insufficient funds.

Ms. Schaftlein asked Mr. Hennessy to expand a little more on watershed management practices throughout the State, since that is a limit to their growth, land use and transportation planning. Ms. Schaftlein asked him to explain this in light of his previous comments about securing corridors. Mr. Hennessy responded that he was not against protecting corridors, but that he feels that environmental concerns have not been adequately weighted in those decisions historically. He did not feel that he was prepared to speak to the Phase II watershed controls since he has not been directly involved in that process. Ms. Schaftlein asked about the 50' buffer around streams, and how that affects the pipeline system in these areas. Mr. Hennessy

responded that there are several requirements in the rules that address primarily nitrification problems in the river basins: there is a stormwater component required by the municipalities, a buffer component that he deals with that requires a 50' vegetative buffer around all perennial and intermittent streams, and there is a stormwater component to that which requires a permit for new development to have sheet flow through that buffer. This treats the stormwater in two ways by trapping nutrients in the buffer, and filters water through the ground further purifying the water. Ms. Schaftlein asked about how this works with redevelopment, which has been a "rising bar" standard, crippling this kind of development with new requirements like underground vaults for stormwater storage. She further asked how stormwater treatment for new development would be handled in a corridor land use scenario, which is a significant environmental hit, but better than the "dimple" effect. Mr. Hennessy replied that municipalities are required to develop stormwater plans that retrofit for 30% nitrogen reduction over time. He also said that since these rules are relatively new, there hasn't been time to integrate them with transportation and land use planning. There is an overarching model framework, but there has been no attempt to identify financing for developing or implementing the local stormwater plans. Mr. Lane asked Mr. Hennessy to further elaborate on the Corridor Protection Map Act and its affects on wetland impacts. Mr. Hennessy responded that it is difficult to work with avoidance along a corridor that has been protected for a long time since there has been development that has risen up on both sides of that corridor. Mr. Finger added that North Carolina has a Thoroughfare Plan requirement since 1958, and that anyone drawing lines on a map since that time and before NEPA (National Environmental Policy Act of 1969) weren't thinking about NEPA requirements. So a lot of those lines are still there and there is funding and political expectation behind them, said Mr. Hennessy. The subdivision ordinance would require that someone reserve the right-of-way for that road and that to move it would have many impacts on the built environment. Dr. Morton commented on how difficult it is to

erase something as simple as a line on a map if that map is the Thoroughfare Plan, which is what he has encountered with the Eno Drive project in Durham. Mr. Hyder commented that this is one of those projects mandated by the legislature. Mr. Finger noted that the longer one waits to build one of those projects, the more money you receive, since one of the factors in the equity formula is the number of unimproved intrastate system miles.

Ms. Schaftlein asked Mr. Hennessy to comment on the changing environmental investment expectations coming out of transportation projects. Ms. Schaftlein noted that by overlaying the endangered species act over those lines on a map forced everyone to re-think those lines to a certain extent. The lines can still go through, but the cost of environmental mitigation will be higher than anything you have ever seen before. Those choices and those payments are happening now, but she doesn't know if that is happening here. Mr. Hennessy responded to Ms. Schaftlein by saying that the let schedule for NCDOT for the last several years has been over \$1 million and that is hard to go to the eastern part of the State and build a road without hitting a wetland. He couldn't begin to estimate the amount of impact they are incurring by building the road system there. He continued that NCDENR struggles every day with how to develop mitigation strategies for wetlands and streams, and fighting with NCDOT to bridge the high quality systems. The average cost of bridging a wetland is about \$1 million per acre of wetland. To NCDOT's credit they have become more environmentally sensitive by funding positions within the Division of Water Quality, they have worked with NCDENR to improve their processes, which, if implemented, would mean a two-year reduction in the amount of time to build a road. NCDENR is working with NCDOT to push a lot of the environmental permitting work back earlier in the planning process instead of what they are doing now. Ms. Schaftlein asked if, in the end, mitigation costs are not going up. Mr. Hennessy replied that the mitigation costs are going up, because they are still doing the mitigation project-by-project. There is still a long way to go to make the process better. Mr. Finger commented on how there was a project in his area

that turned over land to the Catawba Land Conservancy for mitigation purposes. Mr. Hennessy noted that the previous governor and this governor have adopted the million-acre initiative where they want to set aside a million acres of wetlands and open space, and that NCDENR is trying to dovetail that initiative with NCDOT for mitigation requirements. Using NCDOT's money to identify high quality areas that they want to set aside, and incorporate that with GIS mapping. By identifying these high quality areas, they can (1) help NCDOT identify them and avoid them, and (2) work with the million-acre initiative as well. Mr. Hennessy said that NCDENR has a 1:1 mitigation ratio, and that flexible options are being explored. Mr. Lane asked if the mitigation area has to be close to the project; Mr. Hennessy responded that it has to be within the same eight-digit hydrologic unit as the impact. NCDENR is still abiding by the in-kind, in-place, and close proximity mentality of wetland mitigation, although more flexible options are being explored that would be a functional analysis that tie into watershed management plans. An example of such flexibility would be where NCDOT would be required to mitigate a 50-acre impact with 25 acres in close proximity and another piece of acreage identified in a watershed management plan somewhere else. This is nowhere near policy at this time. Ms. Schaftlein said that there would be areas identified as pristine and less-than-pristine, a kind of environmental zoning. Mr. Hennessy said that we are a little behind Washington state, but are headed in the same direction. One major issue that they have is the sheer volume of impacts they have to deal with in this state, and cited 300 acres of wetland impact for one project, which is crazy. Hence, Mr. Hennessy surmised, the need to get out of the in-kind, in-place box is just as dependent on volume as anything else.

Mr. Lane noted one paragraph of the Expert Peer Review Panel report that talked about traffic impacts, and that CAMPO staff had talked to a lot of people in RTP and elsewhere during the last update of the Transportation Improvement Program that are concerned about those

impacts. He read one paragraph in the report taken from Michele Pardue, Senior Technical Recruiter for Ericsson in RTP:

*"...My husband and I moved to RTP from the Washington DC area to find a good place to settle down, buy a house, continue our careers and get away from traffic. I am convinced that if changes aren't made by area leaders to the traffic situation in RTP in the immediate future, North Carolina will have killed the goose that lays the golden egg. Companies in the Park already offer alternative work schedules to help manage this situation- as evidenced by the now very extended rush hour. Nothing is going to fix this problem with the exception of increased capacity and it needs to come ASAP. I've had several people decline to consider moving to RTP because they have heard about the traffic situation and don't wish to live their lives hostage to it.*

*I sincerely hope you are able to do something to provide relief before the situation is too far advanced to fix."*

Mr. Lane asked the group to consider what trends they say in terms of traffic congestion around the country and around the State, and to respond to the quote from Ms. Pardue.

***Mobility in  
the Triangle,  
and the  
effects of  
charging a  
zero price  
for trans-  
portation.***

Mr. Voith described an example in his native area of Philadelphia where they have been adding roadway capacity, yet the congestion profile is getting worse. This has raised the question of whether are you using the resources in different ways or are you shifting people from one place to another. Mr. Voith continued by saying that it all comes down to two things in terms of public policy. There has been an implicit rule that highway investments will follow demand. If there is congestion, you will solve the problem. Now, what does that tell anyone who is trying to make

a public policy decision? I'll build it here and there and over there, and we will accommodate you, although there is no money to do that now. This has been the rule, and it's been a sensible rule. The implication of that rule is the following: you take money from communities that don't need transportation investment and you build competing facilities and the activity shifts there and the people who paid for it are suddenly left at a competitive disadvantage. The new community gets a whole lot more activity and they start generating a whole lot more tax resources, but they aren't solving their congestion problems. We build the next road out where we anticipate the next wave of development. Mr. Voith said that it is a funny kind of financing mechanism, but on the average the user does pay but it's an intertemporal thing. Really, you are financing increments based on what cumulative revenues the communities are willing to pay. If you charge zero price, then you are going to ration, and you ration by constraining the supply by quantity, and it fills up. It doesn't necessarily have to be a growth area. In your area, which is growing, it's nice because the competing areas don't actually lose population and that is a good thing. You have to really be careful about charging a zero price for anything, because there has to be some mechanism for people to make choices other than it's free.

Mr. Finger noted that household size is going down, and vehicles per household is going up so that people are putting on more miles on each car per year, on average. It isn't the growth, it's that we drive more and more and it's this auto-orientation of the land use that causes you to drive more. Mr. Voith responded, saying that people are driving for every trip. One of the research topics that he has been studying is how people adjust to how much land they consume and how big a drive they want in response to how much the price of that land is. As it turns out, the elasticity is pretty darn responsive. Mr. Voith continued by saying that while adding a new transportation facility locally increases the price of the land immediately adjacent to the facility because that land has better access, the access to the entire, larger area has also been increased, thus depressing the overall market. So people buy more of it,

they like it, and they spread out so there's more pressure for larger lot zoning and greater consumption of open space. It's just supply and demand, and I think we have to keep that in mind that there are underlying forces in effect.

Dr. Rathbone said that a number of areas have created a number of urban loops recently. He recalls being a part of a study that looked at the effects of the loops on urban areas. This creates areas of high accessibility as any model will show, perhaps higher accessibility than anywhere else in the urban area. This has the result that the downtown area gets more and more depressed. Dr. Voith surmised that this is the critical issue facing this area right now, and how will they react to it.

Mr. Lane noted that some recent research has questioned whether the development that occurs at new interchanges is really just a redistribution of growth from other places. Mr. Voith said that increasing the supply of accessible land is a good thing, too, since people can afford to live at a lower price. But there is this ancillary effect that is negative since people tend to spread out and they have to travel further and create more congestion.

Mr. Lane said that in the 1960's there were a pair of papers that explained the spatial mismatch hypothesis, which simply stated was the effect whereby lower income people were separated from employment, educational, and health opportunities. He asked Dr. Morton and Ms. Berry to extrapolate on that effect based on what they had seen so far. Mr. Voith said that one of the great pressures that he had faced as a director of SEPTA was a huge expansion of employment in the suburbs away from low-income people in the city. They were thus confronted with how do you ameliorate this spatial mismatch, a real conundrum that is faced here because the services that take people from dense areas to less dense areas are very, very expensive in terms of cost per rider. The organization is then faced with taking money away from cheap, easy-to-serve communities and putting it into new

lines that aren't very well patronized but are providing accessibility for jobs that aren't in the city so that some new people are getting service. What you are doing there is lowering the implicit subsidies for locations that are attractive (short trips) and subsidizing locations that are mismatched or have long commutes. When longer trips are subsidized this way, it removes one of the few competitive advantages that the central city has to offer. All of the low-income people that were working there (downtown) suddenly have an even worse accessibility issue.

Dr. Morton noted research at UC-Berkeley that looked at the effects of transportation on land use with the conclusion that the effect is one simply of relocation. So, we have such a rich transportation network already that there aren't any economies of scale to be gained by further building out the network. The overall aggregate level of economic activity isn't being increased, you are simply changing, shifting the location of where businesses are going to open up or where they are going to relocate. Also, Dr. Morton said that he thinks we are examining a vanpool approach to get people from central business districts to suburban employment centers, a lot of which has been funded by the Federal government under the reverse commuting program. He can't see how that will be successful in the long run, since he doesn't think the Federal government will be permanently providing those kinds of subsidies. Mr. Finger noted that Charlotte-Mecklenburg has 85 vanpools that primarily come to the core of Charlotte and pick up people to go to places like Arrowwood Industrial Park and the airport. Every time they buy more vans they fear that they won't be able to fill them up then they fill them in no time at all. The driver pays nothing, and the riders pay enough to cover the costs of fuel, maintenance and replacement. The federal subsidies are only covering the costs of that first vehicle. Right now, they are keeping the old vans and starting another vanpool just because there is so much demand for that service. It is a very efficient form of transportation, Mr. Finger continued, there is no deadhead, the driver lives at that end of that

route and when they get there the driver gets out. There are no salaries to cover. Even so, it is still just a drop in the bucket considering the VMT in the Charlotte area. Dr. Chatterjee noted that Dr. David Hartgen, a professor at UNC-Charlotte, performed a study concerning the impacts of beltways on urban development. Mr. Lane replied that he thought the report had suggested that there was no significant impact on economic development from loop construction, but that there was no analysis of relocation effects within a metropolitan area. Mr. Finger pointed out that a concern with the freeway loop is going to take everyone to RTP, not to Raleigh. Mr. Williams concurred, stating that there isn't much employment on the proposed outer loop now, and that it will serve residents going to RTP or to some employment areas along US Highway 1. Mr. Finger continued by saying that, from a competitive standpoint, it (the outer loop) makes the Raleigh central business district (CBD) less competitive, and makes RTP more competitive. Now, that doesn't solve the problem of how people get around once they get there or get from exit to exit, but it does seem to be a loop for Raleigh but a radial for RTP.

Mr. Lane asked Mr. Finger to explain to the rest of the Panel about an interchange/land use design that Charlotte was considering at one point for its outer loop. Mr. Finger responded that only one interchange is being used for this effort, namely, by creating three two-lane bridges where one five-lane bridge was proposed, they are trying to create a village grid. There is a half diamond at each end with a one-way frontage road connecting them that will enable someone to walk across it. There were a lot of skeptics to start off with in the development community, but now they are climbing over each other to buy this land and build in these several blocks that we are creating for this village center that has a freeway underneath it. If that's a good idea or not we are going to see. What has occurred is that it's not like all the other interchanges, so it has become a situation where developers want to own land at this unique interchange because it's not like all the others. It is becoming popular, and will have provisions for bicycles and

pedestrians, and we're hoping it will all pull together and work well. Mr. Finger further said that they might have done it on more interchanges but that all the other interchanges were already too far along in their development patterns. He said that the cross-street is Prosperity Church Road. In general, Mr. Finger said, the 50-square block area in downtown is really hot for real estate right now. The value of these old homes built on relatively small lots, some of which were in neighborhoods that were notorious for crime 10 years ago, its amazing what they are paying for these homes now. It was good housing stock when they were built, and it can be good housing stock again. As a general rule of thumb they are paying \$200 a square foot for these old houses that have one kitchen and two bedrooms, because its wonderful to live in these neighborhoods where your services are within a walk or a bike ride and if you take your car you don't even have to go through a traffic signal. You can go to work, if you work in this area, and you don't have to experience congestion. People are debating if they are going to sell or not. Mr. Finger said that he thought if you looked at the Cameron Village neighborhood the housing prices are all going up. Mr. Hyder noted that the Five Points and Oakwood neighborhoods are experiencing similar trends. Mr. Finger said and the reason for that is because there are people who don't want to live in a single family house on a corner lot in the suburbs; he isn't sure how big the market is, but there is a market for smart growth. We'll see more things built that way. Ms. Berry noted that she is one of those people. Mr. Finger said that if someone came in with a neotraditional neighborhood plan that consists of one ring road that comes out to access a single point on the main road, then that is not neotraditional development. A neotraditional neighborhood is connected to other neighborhoods and is an integrated system of streets that is bicycle and pedestrian friendly. Mr. Hyder stated that we are seeing grid streets that have one exit, and that isn't it (neotraditional development). Mr. Finger said that all those people are still going to have to get on that one road to get anywhere outside their neighborhood.

***The  
importance  
and  
distinctions  
of  
neotraditional  
development.***

Mr. Voith said that he assumes that CAMPO will put together elements of the different alternative and come up with one, sort of super-alternative. Dr. Morton said he wanted to highlight the issue of accessibility and take another look at this issue. With all of the land use alternatives, the accessibility by low-income populations using transit becomes considerably less than for the M1 scenario. Some additional discussion was held about performance measurement number six on the performance sheets for low-income groups. Mr. Williams surmised that some of the explanation for this counter-intuitive result could be the choice of where the employment centers will be in the future. Mr. Finger and Dr. Morton suggested that the transit scenario used in the example was not adaptive, whereas in reality the system and land use would be more coordinated. Mr. Finger continued to say that one trend is that there is a phenomenal increase in requests for transit service in certain areas so that they can get employees to jobs. Charlotte DOT has changed its express service so that the doors open on the outbound route so that people can get to work. This started several years ago when employers started saying, "You've got to get bus service out to exit so-and-so." Ms. Schaftlein asked then if a corridor and node system isn't being created by default. Mr. Finger said that you are seeing a trend now where employers are needing transit to get people to jobs not just in the old, established parts of town, but in suburban parts of town. In response to a question from Mr. Hyder, Mr. Finger said that Charlotte has express bus service on I-77 north, I-77 south, I-85 north, and he guessed on about 15 routes which radiate in most directions except the northwest. Additional commuter routes that don't even open their doors until they get downtown in Charlotte come from ring cities like Rock Hill and Gastonia and one day from Mooresville. The express routes close their doors 6-8 miles from the center of town then come into downtown as



fast as they can to the CBD. Mr. Finger also noted that Charlotte has some cross-town routes, but they are not express. Mr. Lane reinforced what Dr. Chatterjee had said earlier about the fragmentation of the region and its lack of one definable center core. This makes the spoke-and-wheel transit systems difficult to maintain. Mr. Finger commented that since RTP, which is a kind of employment center, isn't affiliated with any municipality, they would have to rely on NCDOT for transit service. Mr. Hyder did note that there is a regional transit authority. Dr. Morton countered by saying that the RTP employers are well-organized and that if you look at the most recent Transportation Improvement Program (TIP), they are having an impact in terms of projects that will provide relief to that area. A number of the employers in RTP are in Durham County and are affected by the Durham Transportation Demand Ordinance recently adopted. Mr. Hyder asked what the requirements were for that ordinance. Dr. Morton said that the requirements were, in his opinion, rather minimal, but there is a requirement that each employer designate a transportation coordinator. The coordinator's function is a contact and source of information on other modes besides single occupant vehicle or telecommute. Another requirement is that the employers need to survey the commuting behavior of their employees, and the third major requirement is to develop their own trip reduction plan. These are goals that the employer sets; the ordinance does not specify those goals. The remainder of the plan contains the incentives or other initiatives that the employer will launch in order to reduce the number of trips made by single occupant vehicle. There will be an oversight function by a review board. Mr. Lane asked how far away Wake County was from adopting trip reduction goals and what were the obstacles to doing so. Dr. Morton asked first how to interpret the carpooling rate. Mr. Lane explained that the carpooling rate is actually determined on a

***Managing  
demand at  
Research  
Triangle  
Park and  
across the  
Triangle  
Region.***

person rate not on a vehicle rate. These are daily numbers, which include shopping and school trips, which would reduce to a more familiar number once they were converted to vehicle trips. They are there for comparative purposes only. Dr. Morton noted that there was no significant change in carpooling rates between the intensive highway and demand management scenarios, which is perhaps reasonable. Dr. Morton surmised that voluntary travel demand reduction measures tend to be much less successful than mandatory programs. The political reality in this area is that you are compelled to start with some voluntary approach to demand management, which is the most important lesson from the Durham experience. You need to start with a voluntary approach and have a champion for demand management, which they did there who worked at Nortel. Even with a voluntary approach to demand management, you will find employers who are very, very resistant. Even though demand management is an important tool, you must really think about how to market TDM and how to approach employers, by pointing out the benefits to them (productivity, etc.). A marketing approach based just on air quality reasons probably isn't going to be sufficient, Dr. Morton concluded.

Mr. Williams pointed out that the rail line comes close to the airport but does not connect to the airport, and he thinks that is a real deficiency. If that connection were made, that would make the rail option more feasible. Mr. Lane agreed that is a good point, and one that has been discussed. Mr. Williams agreed, but he wanted to make sure that this point came out of the Panel discussion as well. Mr. Finger commented that, for comparison, the Charlotte airport has said that if you get rail close, they will build it the rest of the way to the terminal. Mr. Williams said that there has been some scuffle between TTA and the Duke University and Duke Medical Center, a really big stop in terms of employment and as a trip generator. He thinks some of that has been ironed out, but he isn't sure. Mr. Voith said that Philadelphia has a not terrific situation there between rail and the airport; it carries a lot of employees. Mr. Finger said that Charlotte's airport authority

points out to them how many employees they have, and that a lot of people think that mass transit should only go to the airport because that's the only time they have ever used it in other places, like Washington or Atlanta. The truth is that just serving the airport by itself won't give you enough riders to support a rapid transit system, but it's still a very important link, psychologically if nothing else.

Dr. Rathbone said that he does a lot of surveys with his publication, and the one thing that people who have done rail in their areas always say is that they should have done is to preserve the right-of-way, exclusive right-of-way, reduce the number of at-grade intersection to reduce the number of accidents, and to reduce operational costs. There is a lot of benefits to that in the operational sense. Mr. Finger interjected that this is true in the liability sense as well. Mr. Hyder and Mr. Lane commented that the proposal being discussed now in the Triangle Region is regional rail, not light rail, and that there are differences in terms of speed of the service and number of stops. Mr. Voith noted that there is a real problem with operating a transit system alongside freight service.

Ms. Schaflein noted that there are a whole lot of projects on these plan alternatives and no sense of sequencing. She continued by saying that from her experience in the Puget Sound that while growth management, corridor development, and so forth was going on, there was no attempt to preserve the right-of-way for transportation infrastructure. She said that the price tag has been so much that they haven't kept up the infrastructure to support the infill, so consequently there is a lot of employment occurring out beyond the growth boundary. There are a lot of things out-of-whack, even though we think there are a lot of policies that are heading us to the right place, so it would be really useful not to think just about the endpoint plan, but about the sequencing of pieces as you move forward. Dr. Rathbone said that he agreed, and that in Washington, D.C. there is a long-term plan in place but what is not studied is opening one section of a

highway and the effect that has on the surrounding traffic pattern for a number of years. Is it possibly the role of the MPO to look at that sequencing? Mr. Lane responded that the way they have approached this issue is to divide the plan up into time chunks, 2005, 2015, and 2025, then look at what is left over that will happen beyond 2025. A lot of that sequencing is based on financing and air quality conformity (Mr. Hyder). Mr. Lane said that a lot of the things in these plan options aren't funded, and that the area is still trying to develop a trunk system. In terms of bike and pedestrian facility funding, for example, those funds come from two places: local governments and private development through subdivision requirements enforced by local governments. Mr. Lane noted that the State does not have a large role, and that he had commented previously that it is less costly for a municipality to ask for a multi-lane freeway than it is to ask for a sidewalk because of a matching sliding scale for sidewalk. This is true of maintenance as well.

Mr. Lane asked Ms. Lorscheider about ITS planning and its current status in the area and State as a whole, because there has been a lot of activity recently in this area. Ms. Lorscheider began by noting that we are a donor state, that we have realized we can't build our way out of it. We can't operate our way out of it either, but we do know that

***The role of the MPO in sequencing projects in the final plan.***

operations has become a new part of the way we do business. Operations is a partnership, and we could use some of the technological expertise in the Research Triangle Park, which could become one of the strongest partners. They could build a system better than anything the NCDOT could build; they should do this in recognition of the role they play in traffic congestion. Ms. Lorscheider concluded by reiterating that partnerships is becoming the way NCDOT does business. Dr. Morton commented that he was aware of the variable message signs; what other

deployments of ITS are there in this area? Ms. Lorscheider responded that increased emergency event coordination is taking place, signal system feasibility studies for Raleigh and Garner, adaptive signal systems in Durham, and coordinating with TTA as the Phase I Regional Rail System comes on-line. Mr. Finger mentioned the camera detection system in Charlotte, and emphasized the issue of cooperation between different emergency responders. He noted that the NCDOT has taken on that role of facilitator between these agencies. Mr. Lane asked Ms. Lorscheider what some of the benefits of ITS technology are, apart from traffic signal systems. Ms. Lorscheider responded that public safety, mobility (the value of time), safety of operation personnel, emergency response, and air quality are all benefits. The media think that those are there cameras now (laughter). Mr. Finger said that there is no reason to have the variable message signs with the cameras; there's nothing worse than having the wrong message on the sign. Ms. Schafflein asked if these cameras were web-based for general public access. Ms. Lorscheider said yes. Dr. Rathbone said there were significant time benefits to these devices, and Mr. Finger agreed, citing a rule-of-thumb that for every minute of lane blockage it takes four minutes to clear the traffic. Dr. Rathbone noted that the Federal government has grants of \$2 million for installing sensors, or real-time traffic monitoring. Dr. Rathbone described the technologies being deployed in Philadelphia and Pittsburgh, using microwave and acoustic sensors. Dr. Morton described sensors that can be used to detect sensors, and asked if North Carolina were deploying these systems or are they all highway and transit focused? Ms. Lorscheider said that they were not using those technologies for pedestrians currently, but Mr. Finger commented that Charlotte had been experimenting with these systems. He cited some design problems with these systems, saying that they don't work unless the pedestrian

***The value of  
Intelligent  
Trans-  
portation  
Systems  
(ITS).***

had to leave the main sidewalk to cross the street. Maybe only one signal could be found like this. Mr. Finger continued by saying that they have had good experiences with countdown signals, and that these were being used before the acronym ITS was invented. He said that John Tidwell did a great study and found that less than 50% of people understood the pedestrian displays – which is exactly what you get if you don't know (laughter). He explained the Charlotte pedestrian signal scheme. The flashing hand signal counts down how many seconds they have left to cross. Additional comments about these types of signals ensued, including low-frequency push-buttons for hearing impaired pedestrians. Mr. Finger said that the buses have automated announcements for stops and a message scrolls across the front of the bus as it approaches. He said that the buses are now getting AVL (Automatic Vehicle Location), and that makes the buses work as pilot vehicles to help detect delay. Mr. Finger noted a problem with the lack of standardization of equipment, in spite of Federal efforts to standardize ITS technologies. Dr. Morton said that earlier there was discussion about congestion toll pricing, and he asked if there was ITS technology to facilitate congestion pricing, to make it more automated similar to a system he had seen in Atlanta. Dr. Morton asked the economists present what the state of congestion pricing was in their area. Mr. Voight said that it was not really being used in this country, but that he had experience with EZPass on the east coast that is billed to your credit card, but there is no variable congestion pricing component as yet. Dr. Rathbone said that he had just attended a meeting in New Jersey about this subject, and that they are starting to get results in now from a pilot project there. Mr. Voight said that in Philadelphia EZPass users get a discount but its not time-specific, so that it is actually cheaper to travel during the peak. The nice thing about EZPass is that you buy into it, voluntarily. Mr. Finger said there is still a problem if you have multiple prices throughout the day you still have to communicate those prices to everybody. Where they have been able to pull it off is two HOT lanes in California, where in 15-minute

***Congestion  
pricing.***

increments the price can change. It's an HOV lane that you can only get in if you have a toll decrement device and the price changes by congestion levels. Mr. Voight said that you can't do it perfectly, but you can do the backwards example like the EZPass in Philadelphia where if you have the pass it gives you a discount. They just chose to do it that way. Dr. Rathbone said that it has been hugely successful. Dr. Rathbone discussed the New Jersey results of congestion pricing he had seen at a conference that looked very promising. The Director of the New Jersey Turnpike Authority showed some graphs not yet ready for public consumption that showed traffic moving to the fringes of the peak, which is exactly what they wanted. Mr. Hyder asked if there were any figures shown on the elasticity? Dr. Rathbone said that nothing was mentioned at that presentation. Dr. Morton asked if anyone thought that congestion pricing would occur within the horizon of the CAMPO 2025 Transportation Plan? Mr. Lane also wanted to know if these kinds of technology improvements would equally benefit low-income or minority communities, some of which are not native English-speaking and might have trouble understanding these messages. Dr. Morton said that there was a question about how the revenues are used as well as how the tolls are collected. He continued by saying that one can be creative about how to use the revenues from the congestion pricing scheme in such a way as to partially offset any decrease in welfare that might result. Dr. Rathbone said is actually happening in Sacramento with the HOT lane where the revenue generated is plowed back into transit improvements in that corridor. Mr. Finger said that one of the adverse effects of HOT lanes, that of them turning into "Lexus Lanes," did not turn out to be true since not the most wealthy did not always use these lanes. They were something that people paid for only when they were in a hurry. Mr. Voith said that he wouldn't underestimate the ability of people to adapt and adjust to a new service, including low-income people. He continued by saying that it was not clear to him that you should try to solve income distribution problems with changes to the transportation system; if there is a strategy selected that has an adverse effect on some communities, then,

like this group has already noted, there should be an attempt to mitigate those effects.

Mr. Lane said that he wished to raise one more topic before the break that has been in issue in this area, and that is secondary and cumulative development, which can affect the amount, type, or pace of development. He went on to say that what we have seen here is that water and sewer extensions have more of a role in secondary and cumulative development than does transportation. Mr. Elmendorf responded that he agrees. In Pennsylvania, he continued, growth boundaries are voluntary. The whole idea behind growth boundaries there is that cities and counties, working together, will not supply water and sewage, although developers can still do so. He thinks that the provision of water and sewer service is critical to opening up new land for development, especially farmland. Mr. Lane asked if Mr. Elmendorf thought that cities and towns accrued savings by practicing these limiting policies. Mr. Elmendorf responded by saying that there are a ton of studies on this right now, and it depends on the age of the population, number of school-age children per household, things like that. What they are finding in general is that typical residential development doesn't pay for itself, perhaps \$1.08 for a dollar of services. Mr. Elmendorf said that is where the net value of open space pays off through the concentration of urban services. Some people are saying that the increase in property values realized by the purchase of open space actually offsets that purchase. Mr. Elmendorf said that he is sure he is preaching to the choir here. Mr. Elmendorf said that there was a school district in Pennsylvania that said it was cheaper to buy and hold land as open space rather than provide busing and paying teachers to go to the schools. Mr. Finger said that it gets back to the pricing elasticity of land, that when prices are higher, lots will be smaller. This will not only make it easier for government to provide those services, but it makes it easier for power and telephone; everything. Mr. Elmendorf said that developers said that one attractive part to developers about this for governments and developers is the reduced

costs of providing narrower and shorter roads, as well as sewer services in these conservation subdivisions, reducing the costs to developers and municipalities. This is another positive effect of open space. Mr. Voith said that the flip side of that is that with smaller lot subdivisions total income earning potential is higher while service delivery costs are lower.

Mr. Williams said that in reference to comments made earlier about water and sewer service provision on these plans, Raleigh has a lot of infill, greenfield land that could be developed that could give us the densities we need to make transit work. There are 800 acres inside the beltline at Centennial Campus that would be a great place to try higher density development, as well as state-owned land around the Oakwood area. There is land that is being held by the State that could be used better. We have more opportunities for infill development that could be used for something special, create higher densities for transit, and preserve open space. We should look at opportunities in west and south Raleigh, but it is the State government that is going to have to take the lead. Ms. Dixon said that the preservation of open space should not be done piecemeal, but done in the context of a plan. Ms. Dixon noted that one of the problems is neighborhood opposition to infill development. She said that she is surprised that when she encounters the public, their attitude is that a two-acre lot is open space. She also cited severe neighborhood opposition and political issues. Mr. Elmendorf said that planning literature in the 1960's were critical of issues like the interstate highways going through publicly owned properties, like parks in Boston set aside at the turn of the century for public open space. He said that open spaces in the center of this developing and fragmented area could be crucially important as open space resources. But he does agree with higher

***The  
perceptions  
and the  
realities of  
street  
interconnecti-  
vity.***

densities, it is all just a matter of planning.

Mr. Hyder said that interconnectivity of the street system is important to serving these land uses, that people tend to fight. It is needed, particularly outside the beltline in the county. Mr. Lane noted that it is easier to do this in an undeveloped area; it is always much more difficult to retrofit these ideas of interconnectivity. Mr. Finger said that another thing you face is that people who are interconnected won't give up access for less through traffic. But people who aren't interconnected think that the worst thing that can happen to them is doing this. Mr. Voith agreed that people are different. Mr. Hyder said that very often you aren't talking about a quantum leap in traffic, although that is often the perception. Mr. Finger said that you are going from 600 vehicles per day to 2,000; but it is perceived as "killing my child" on the day that it is opened.

Ms. Schafflein said that Mr. Lane had asked about national trends, and she said that the national trends are that every major transportation project is being held up because of secondary and cumulative impacts. Ms. Schafflein said that there needs to be more planning for secondary and cumulative impacts, especially when they come to the permitting agencies. It needs to start at a systems planning level and bringing their best available data, and that starts the secondary and cumulative analysis. Ms. Schafflein said that there needs to be something done

between the two paragraphs for Denver and the 80 pages for Baltimore to get by right now. Mr. Finger said that the way secondary and cumulative impacts are interpreted here is that if the project has the word "bypass" associated with it, then you have to include the economic impact of the bypass. Ms. Schafflein said that while she is

***The  
importance of  
having a green  
infrastructure  
plan in place,  
and having  
the  
involvement of  
transportation.***

confident that her DOT could mitigate the direct and immediate impacts of a project, do the communities in the travel shed have consistent policies that, at a minimum, would do no harm and at maximum make environmental investments that improve baseline conditions. This gets you back to the green infrastructure plan, and not having this as an afterthought susceptible to political maneuverings where not every commitment is followed through. Mr. Finger said that the integrated land use/transportation plan works for Charlotte because governments stick to the land use plan. Ms. Schaftlein said that communities can make their investments in mitigating environmental impacts ahead of time so the environmental commitments are driving the policies. Mr. Elmendorf noted that in Pennsylvania local governments can do just about whatever they want. Mr. Lane agreed that North Carolina was similar. Mr. Elmendorf continued that communities were overlaying special use districts on freeway interchanges, a real hodge-podge of things. Mr. Elmendorf said that there was a freeway that was punched through Happy Valley, and every one of the 17 towns got an interchange, and that was part of the deal that was made to eliminate opposition. Inter-municipal cooperation in Pennsylvania is something people are trying to understand, since it makes any kind of planning difficult, if not impossible. Ms. Schaftlein asked how do you fast-forward that cooperation without coming down with something draconian, like the Atlanta think (GRTA)? How do you show other examples around the country where people have demonstrated build out scenarios and see how the world looks. To get to a certain result, certain things have to be accomplished. Mr. Voith said you have to get everyone to agree to a certain plan. Mr. Elmendorf commented that Pennsylvania has the highest rural and urban populations in the state, and they have completely separate attitudes which makes it very difficult. He said that money makes a difference. Mr. Hyder said that in regards to the draconian Atlanta thing (GRTA), no one believes it can happen to them until it does happen. Mr. Finger responded by saying that in defense of ARC (the Atlanta Regional Commission; the MPO for the Atlanta area), they weren't going in the

wrong direction, but the counties were telling them that it couldn't be true.

Mr. Lane discussed the break and issues to be discussed afterwards: political buy-in, continuity for various plans, secondary and cumulative impacts, and implementation of plans in a fragmented environment.

Mr. Lane began the final session by discussing the roles and problems of governments in adopting the long-range transportation plan, and asked the panel's thoughts about adopting and implementing a transportation plan. Mr. Finger said that the adequate facilities (APFO) concept (M1d) encourages sprawl and works against smart growth since it pushes growth further out if the development can't meet the test. It encourages a smear pattern. Mr. Finger said that he had heard someone from the Center for Urban Transportation Planning (CUTR, at the University of South Florida) say that the "the American Dream has become for everyone to live in a small town near a big city; if we all get what we want, then there will be no more small towns and no more big cities." Mr. Finger continued by stating that a lot of the things we come up with tend to smear things out by trying to minimize the impact to any one location. Mr. Lane asked if what Mr. Finger had said about APFOs couldn't be extended to any local growth control policy, including impact fees. Mr. Finger said that if impact fees were applied statewide then they would have to go to another state, but if Raleigh has impact fees and Garner doesn't, then that tends to push things towards Garner. Ms. Berry said that she appreciated the comments that Ms. Schaftlein had shared in her survey response concerning the need for bigger scale plans instead of project-by-project mitigation. CAMPO doesn't have the staff to outreach to those agencies; finding the staff to reach out beyond your little boundaries

***Regional cooperation and its importance to successful development.***



(transportation) is your biggest challenge. Ms. Schaftlein said that she appreciated this workshop since in her area the MPOs have often been in the mode of “kill the messenger.” Ms. Schaftlein said that she viewed the challenge as to how to make everyone act more regional in governance and cooperate together. She continued that the only way was painful and required you to get all your technical and policy people to sit down together and go through the policy and permitting processes. She said that in her area they are getting to the second phase of that work, and that everyone realizes that no one gets what they want until they reach decisions together. Mr. Lane complimented the Charlotte region on their workshops that invite local leaders to discuss benchmarks in various areas for every county in the region. They discuss the performance in crime, transportation, etc. and then break up to hear presentations on solutions to these problems in presentations. Mr. Lane contrasted those continuous dialogues with the more sporadic, issue-specific discussions that are held in this region.

Dr. Chatterjee said that he thought there was a lot of planning in this region, and he is hopeful that it could implement a regional approach. Mr. Lane said that he thinks it is difficult because the area is fragmented by so many governments. He thinks there is general support for Ms. Dixon’s idea of merging in some fashion the two MPOs in the region, but there is even deeper fragmentation between some of the towns in each MPO than in CAMPO itself, or at least that is a popular perception. Mr. Hyder said that one of the drivers that will force

the two planning areas to come together is the recent state requirement for joint strategies to address air quality. Mr. Finger said that he had been in Charlotte since 1978, and at that time the surrounding towns felt that whatever was bad for Charlotte was good for them. Somewhere along the way, on their own, they began to realize that what

***Ongoing  
plans and  
past  
successful  
public  
involvement  
efforts.***

was good for Charlotte was good for them, at least economically. You could see the change when they approached Concord about a commuter train to Concord. The officials in Concord said why should they want people in Concord to take jobs in Charlotte; we want them to take jobs in Concord, a parochial view. But at some point in time it just flips over, and you realize that you’re all in this together. This happened sometime in the 1980’s as a result of actions taken by the Chambers of Commerce and other leaders. There is a general feeling now that you have to do something about roads, but roads won’t be enough and you have to have a transit system, that conventional wisdom now permeates the region, not just Charlotte. Mr. Finger said that the Committee of 100 came up with a plan that everyone loved, they just couldn’t figure out how to pay for it. York County, South Carolina was the only county that figured out a way to pay for their portion of the plan, and they have implemented almost everything in that plan. They now stand ready to extend the light rail line coming from Charlotte as soon as they (Charlotte) tells them exactly where it is coming across the state line. They are ahead of everybody. Mr. Finger continued and said that the Committee of 100 recommended a one-cent sales tax for roads and transit, and the N.C. General Assembly told them they didn’t have a chance in the world. York County went to the South Carolina General Assembly, which agreed that the plan was a good idea so they got their one-cent sales tax. They have been able to build everything they wanted with that phenomenal infusion of money. Mr. Hyder noted that South Carolina is a home rule state. Dr. Morton discussed the infrastructure component of a plan which may require millions or billions of additional dollars, then you need to harness the work that has been done by the four mayors’ Regional Transportation Strategy. There is no land use component to the plan, just focusing on infrastructure. Dr. Morton described the Regional Transportation Strategy developed by the mayors of Raleigh, Durham, Chapel Hill and Cary. This study found that \$10 billion of additional investments in transportation, much of which is in transit and bike/ped related. Some of the presentations that he has gone to have suggested that the



corporate and real estate audiences are very receptive to that message. The other component is land use, which might need to have a visualization approach, showing what the area would look like under different visions of the transportation and land use system. Dr. Morton continued by describing an effort made by the Environment and Law Policy Center that picked four different counties around the Chicago area. Using talented artists, they literally painted what these areas would look like under three different scenarios. One was the baseline, one was a future growing like it was today, kind of haphazardly, and the other scenario was what the area would look with smart growth. They have brochures and pictures on the Internet, and you can see what the differences would be, good and bad. It must be creating lots of discussion about the differences between the good and the bad. Visualization is a very powerful tool for outreach to the general public, much more so than any statistical analysis. Ms. Schaftlein pointed out that GIS can be used the same way to show "If then, what." Mr. Elmendorf said that something similar had been done in Pennsylvania to show what would happen under a variety of different ordinances.

Mr. Elmendorf said that many of the rural counties are trying to focus on water quality now, which is not unlike air quality. They form a watershed commission coordinated by the county that can be used to discuss a variety of growth-related issues, not just water quality. Water quality as well as open space consistently ranks high as what is important to your community. People can relate to water quality because they can identify with specific features. Dr. Rathbone said that what can be done to counter very vocal civic groups is a survey, perhaps linked to a visual presentation. Politicians find it difficult to go against the results of a survey. Mr. Lane noted that only those who have a problem with whatever it is you are proposing come out to speak or fill out surveys. How do you get past that, since everyone is so busy? Ms. Schaftlein said that it requires specific targeted outreach. Mr. Elmendorf agreed saying that you have to get them comfortable, provide transportation, daycare, and food. Mr. Finger said that they had

good experience with giving people felt-tip markers to draw out where things ought to be. By the time they were through they had ownership in the process; they came to find out if the project was close to their property, but then they got involved. Sometimes they would even say that a transit station could be close to their property. A workshop works a lot better than a meeting. Mr. Lane described a similar technique using pieces of colored string representing how many miles of sidewalk or roadway could be built using projected funds. Mr. Elmendorf described sacred place mapping, a grass-roots based planning process used in environmental matters. Its great to get high school kids involved. You can give these kids disposable cameras to show those places that are important to them. Its pretty phenomenal what comes back, capturing cultural values. Ms. Berry agreed that the disposable camera idea is a good one. Mr. Elmendorf said that often a professional photographer would go out and take a picture of the same scenes, then do a slide presentation.

Ms. Dixon said that there seems to be a lot of planning efforts going on right now, and she wonders if CAMPO shouldn't be using data from other sources, like the TJCOG effort (Regional Choices project). Mr. Lane said that there are a lot of perceptions out there about where and how people want to live, and there is a debate about if those choices are made because people really want to live that way or because they have no choices. Ms. Dixon asked how Mr. Lane sees this playing out considering land use and development scenarios agreed upon by the municipalities. Mr. Lane said that the public involvement plays out on different fields, one at the general public and stakeholder level, and another at the technical and policy-making level. Mr. Lane continued by saying he feels that they have pretty communication with the Chamber of Commerce, town councils, and that they can do that again. Certainly, if the public and boards of CAMPO tell us that we need to bring some of these land use ideas forward, then we should consider how to do that. Mr. Lane said that you can offer rewards and disincentives for following these policies; he is not sure they need to provide a strict

methodology for how to provide densification and mixed use. Mr. Lane discussed the potential of the Triangle J Council of Governments and CAMPO of changing their roles in making some of these changes occur. CAMPO may have to step forward to reexamine their function in these changes. Ms. Dixon also noted the water and sewer and growth management task force efforts being undertaken by Wake County. Mr. Lane said that the latter effort shares similar objectives to the ones shown to the Panel. Mr. Lane continued to discuss the various and often disconnected plans, as well as the State's lack of providing a vision for almost anything, including policies on secondary growth, how we protect places that are important to us, and so forth. There is still a common conception that we can continue to do what we are doing now ad infinitum and that the baseline conditions won't change; we are starting to see that isn't true anymore. How that message is communicated is a question, to note that if changes aren't made quickly, then any change may become very difficult in the future. Mr. Lane finished by saying that there is definitely a comprehensive element that is missing at state and regional level, as well as the local level. Things are still very fragmented and that makes it very difficult to explore these options. Ms. Schaftlein asked if there is some potential for NEXTEA to create some additional influences that could be a part of the dialogue. This may make the other drivers assist in the planning process so that you won't have to do it alone. Mr. Lane said that it did take a while for the Clean Air Act Amendments to make an impact on the area. Almost every meeting of CAMPO there is an air quality issue, but it took a long time to get there. Given the pace of development in the area, is there really another 4-5 years to wait for a new issue to arise. Mr. Lane said that many regulations that are quite explicit simply make more paperwork to allow you to keep on doing what you were doing anyway, although its not always true. Mr. Hyder cited the three-year requirement for the plan update cycle, which basically increases the amount of work to do while reducing the amount of time to do it in. On the other hand, without that requirement you would have a seven-year long-range transportation plan. Ms. Schaftlein says that you need

to use conflict management to move the process, and that the transportation sector will have to take the lead in funding community organizers to bring everyone together. There will have to be progress in realizing what the scale of the issue is and how to address it. Mr. Elmendorf said he liked the notion of performance-based development standards, as opposed to very regulatory zoning. Certain broad criteria have to be met, but the local governments can figure out how to do it.

Mr. Lane asked about how to get additional funding, and what are some ways that could save money. Ms. Lorscheider said that you need to look at what your priorities are, and as a government are we doing those things that would be generating a profit in the private sector? There are profit-generating transportation issues and opportunities out there. Mr. Lane noted how the ITS infrastructure has had to work very hard to get money, even though it can increase efficiency. Maintenance has a similar difficulty. Ms. Berry asked if ITS was affected by the equity formula and equity distribution problems? Mr. Lane responded in the affirmative; Mr. Finger said that if a special Federal earmark comes to the urban area, then that is exempt from the equity formula. Ms. Lorscheider explained that legislation, which was put into place in part because of a situation that happened in CAMPO. Mr. Finger elaborated on the effects of the equity formula to a region that gets more money in a grant – it must then give up the same amount of money. Mr. Finger continued and said that Charlotte funds improvements on US- and state-numbered routes because they realize that the state will never get to them. Some of the projects they have requested since the 1960's. Over \$100 million dollars has been allocated so far; it's a tough answer, but if Uncle Sam and the state can't do it for you, then you may have to do it yourself. Dr. Rathbone said that even though tolls aren't politically acceptable they shouldn't be discarded as unusable. He cited the case of Texas that seldom considered tolling, but the state legislature there has just approved tolling on new facilities. You can't toll existing facilities, but you can toll new facilities letting clean air vehicles, transit, and carpoolers go by free. There are so many

things you can do with tolling that he feels it is too important to discard. Dr. Chatterjee said that there is a Federal program to sponsor HOV/HOT projects, and they would be very happy to fund a project in the southeast since most of them are happening in Texas, Florida and California, but you have to ask them pretty soon. Dr. Rathbone emphasized that they are actively looking for projects now.

Mr. Lane asked if the reverse of growth boundaries could not be applied, for example, protecting important areas. Mr. Elmendorf said that this concept was talked about 30 years ago, and to his knowledge it hasn't occurred yet in the United States. Mr. Elmendorf said that he had a concern that even if the open space and important environment areas were brought into the public decision-making process the future of that open space is still wide open. However, it would be a step in the right direction to create these (mapping) overlays. Ms. Dixon described efforts at the Triangle Land Conservancy to map important open space areas, and that CAMPO could use that to describe where to adjust densities to respect these open space areas. That layer could always be updated later. Mr. Finger brought up the case of open space in Boston originally described by Mr. Voith. He continued by saying that if you can ride your bike through that space you feel much more involved in it. Mr. Elmendorf described bond issues for purchasing open space, like the second \$100 million bond passed in Montgomery County, Maryland. They use the money to ask the local governments to adjust their zoning, form parks and recreation plans, and open space plans. Ms. Schaftlein said that there some entrepreneurial things that could happen once you put all of this mapping together to work with the private sector in mitigation. Ms. Schaftlein said that buying the land earlier, you can turn a four-year permitting process into a six-month permitting process, and save several million dollars. This breaks a plan-

***Consensus  
and the  
management  
of new  
growth.***

fail cycle with your transportation cycle. Some odd bedfellows have emerged with the Bureau of Land Management coming to (state) DOT and say that they will pay for a span over sensitive wetlands because we will get more value out of it. Ms. Dixon wanted clarification, asking if this happens because you have done a plan for the entire area? Ms. Schaftlein said you end up changing the way everyone thinks about who pays for what and who works together. Ms. Berry said that NCDOT has started paying for positions at NCDENR Water Quality Division to help accomplish their goals.

Mr. Lane asked if it was appropriate that hundreds of millions of dollars are being spent on a few large transportation projects, or is it better spent on upgrading major and minor arterials? This question has not gotten a lot of play, but it is beginning to be asked. Mr. Finger said that if you look at cost compared to capacity, surface streets can do just as good a job as a freeway. Freeways give you the benefit of higher travel speeds and they are definitely safer. You can build five roads in the same 400' right-of-way that you built a freeway. Freeways are popular because you can facilitate that suburban mobility, and they are driven on 20 hours a day without stop, and they are faster during that time. Surface streets can provide capacity, but you will have to stop at a signal every once in a while. Dr. Rathbone noted that freeways are a part of a road hierarchy in a functional classification approach. Mr. Lane asked if we have compromised that hierarchy. Mr. Hyder said that he thinks we have compromised the functionality of the freeway system. Minimum spacing requirements are there to maintain capacity. Mr. Finger said that if you go back to the original idea of the interstate system, then the interstate didn't need to interchange with any road that didn't have a number on it. Mr. Finger continued by saying that I-40 might work better than it does now, and it certainly wouldn't carry as much local traffic on it. But that isn't what people wanted; they wanted to interchange a lot. Ms. Lorscheider said that not everyone wanted those frequent interchanges, like freight carriers. Firms can go out of business if deliveries show up late, she said. Mr. Finger said that it is

probably true here as well as in Charlotte that people thought once the outer loop was built there would be no more traffic in Charlotte. The outer loop is half-finished, and now they realize it isn't going to be that way. The notion that you can build a road and have it solve all of your congestion problems is amazing to him, but it's real easy for the community to buy in. Mr. Hyder said that is what those roads were sold on. Mr. Finger said that communities wanted an outer loop and an interchange in the beginning, but now they are faced with the reaction of people that don't want an interchange on a little two-lane road, and where is the money going to come from to fix that road? A discussion ensued with Mr. Finger noting that there is not enough money to improve all the roads that interchange with the outer loop. Ms. Schaftlein asked about what the lifecycle costs dialogue looked like in this plan, with the infrastructure, environmental mitigation relative to new money. Mr. Lane said that it is at a pretty crude stage, with direct costs being considered, but indirect costs seldom being considered at all. Maintenance costs are considered, both existing and proposed. Ms. Berry noted that the Southern Resource Center can help with assessing costs and finding innovative financing options.

***The pros and cons of outer loop freeways.***

Mr. Lane asked if there are any final thoughts on anything that has come up during our discussions. Dr. Chatterjee said that he didn't hear much about freight, but he knows that some of the big companies in the area are concerned about freight movement. Mr. Finger said that Charlotte is the sixth-largest freight distribution center in the United States, so they have to consider freight. Dr. Chatterjee asked if there were opportunities that are being passed up with connections to intermodal opportunities. Mr. Lane said that it is difficult to get airports and freight companies involved in the process. Mr. Finger agreed, noting that freight carriers often just want a quick fix like a left-turn

arrow at an intersection. Mr. Finger continued, saying that a frustration is that truck terminals are so easily moved and are therefore difficult to plan for in the future.

Dr. Morton said that impacts to cohesion of communities was difficult to assess since he couldn't determine where those communities were. Ms. Berry agreed, saying that is why she couldn't answer the question. Dr. Morton said that because there were so many roads on some of the options, he answered "slightly negative" on all of the questions. Additional mapping would be most helpful. He suggested another measure of accessibility that calculated by walking from a transit stop in 30 minutes, 40 minutes, and 60 minutes. This would be very helpful, as well as trying to tackle the issue of trip chains. The assumption that people are going from one origin to one destination is incorrect, noting that travel behavior is more complex than that. By choosing a couple of low-income and minority centers and surveying them on their destinations likely made, more information on this type of travel behavior could be gathered. Daycare centers would be a good example. In this way, the accessibility of one community could be gathered, and it is likely that you could get a much different insight into what people are doing. Dr. Morton summarized saying that we need activity-based accessibility measures, not trip-based. Ms. Berry said that she wanted to clarify one statement made by Dr. Morton, and that stopping just at mapping where the low-income and minority populations are would perhaps lead to a skewed decision. Issues such as accessibility may counterbalance the physical impacts of a project, so don't just overlay your plan down on a map and measure impacts from that. Mr. Lane asked how in-depth you can get at a systems-level planning process and when to transition to a project-level planning analysis. Dr. Morton again suggested to select one community

***Impact assessment requires more than just mapping out facilities and populations.***

and ask them what the plans' impact will be. Ms. Berry suggested that contacting agencies that typically work with these communities can give you a broad-brush look at the impacts, then go to the communities themselves to get a more detailed view of the impacts. Dr. Morton said that while going to hundreds of communities is clearly impossible, these approaches approximate a sampling process.

Mr. Voith said that trends are generated out of change in conditions, and that firms will react to those changes. Responding to a question by Dr. Morton, Mr. Voith said that he was not well aware of land use forecasting models, but he thinks they are the right way to go. Mr. Finger said that there is too many external factors besides transportation that predicts land growth, especially water and sewer connections. Mr. Voith said that is useful at a general point-of-view level. Mr. Voith said that you have to change the incentives in the market place so that it will give you what you want, and those things are built into the parameters of this model. Mr. Finger said that we want to do integrated land use/transportation planning, but land use can't make transportation happen, and transportation can't make land use happen. There are many more important variables in land use than in transportation, Mr. Finger continued. Schools, open space, land prices, transportation, water and sewer all contribute to make it tough to do a land use model. Ms. Schaftlein said that you are trying to get concurrency on all of those issues, actually a very socialistic kind of planning, but you are trying to get concurrency on all of those variables. Mr. Finger said that Minneapolis-St. Paul has a regional planning authority that does a great job, and the reason for that is that they have authority over water and sewer extensions. It is tough to pull off regional planning in a balkanized state that isn't socialistic.

***“... I would like to come back in 25 years and do some real Monday-morning quarter-backing.”***

Mr. Lane noted that a correction to the emissions numbers will probably bring them back closer to the budget. Mr. Hyder said that it would be nice to see if the land use scenarios actually impacted the number of trips, not just vehicle miles of travel. He also noted that MOBILE 6.0 will change the numbers. Mr. Hyder said that you can't test against the 8-hour standard; Dr. Morton said that because of the NOx SIP call there has been enough modeling done to allow a comparative analysis. Mr. Hyder replied that you can run a comparison, but that since the NOx SIP call mainly addressed stationary sources, the mobile source emission is static. We are fairly certain, however, that additional controls will be needed. Additional discussion was held about the relative importance of mobile and stationary contributors to NOx emissions.

Ms. Schaftlein said that one of the things they have trouble with is determining whose party they can go to. Transportation assumes that everyone has to come to their party; transportation needs to change that situation and make it more equitable. She said that she would like to come back in 25 years and see what really happened (laughter).

Dan Rathbone noted that traffic impact studies can be effective in helping achieve a balance in land use and transportation. Getting the various jurisdictions together to coordinate their requirements can be very helpful.

Mr. Williams stated that there a lot of opportunities here to create better transit and communities here. Some additional discussion was held on the remarkable rate of return on housing in the central city area. Mr. Williams said that part of that was the small supply and the increasing demand.

Mr. Lane said that he appreciated everyone's attendance and participation.

**The Capital Area MPO and Its Partners**

7 [www.raleigh-nc.org/campo](http://www.raleigh-nc.org/campo). This is the official home of the CAMPO website. Traffic and transportation planning information reside here, as does quick access to all the government members in CAMPO.

**Economics and Demographics**

7 <http://web.co.wake.nc.us/planning/default.htm>. The Wake County Planning Department does an excellent job maintaining a comprehensive and easy-to-use summary of water and sewer planning, land use planning, demographic changes (including the 2000 Census), open space and historic property identification, and economic profiles.

**Our Environment**

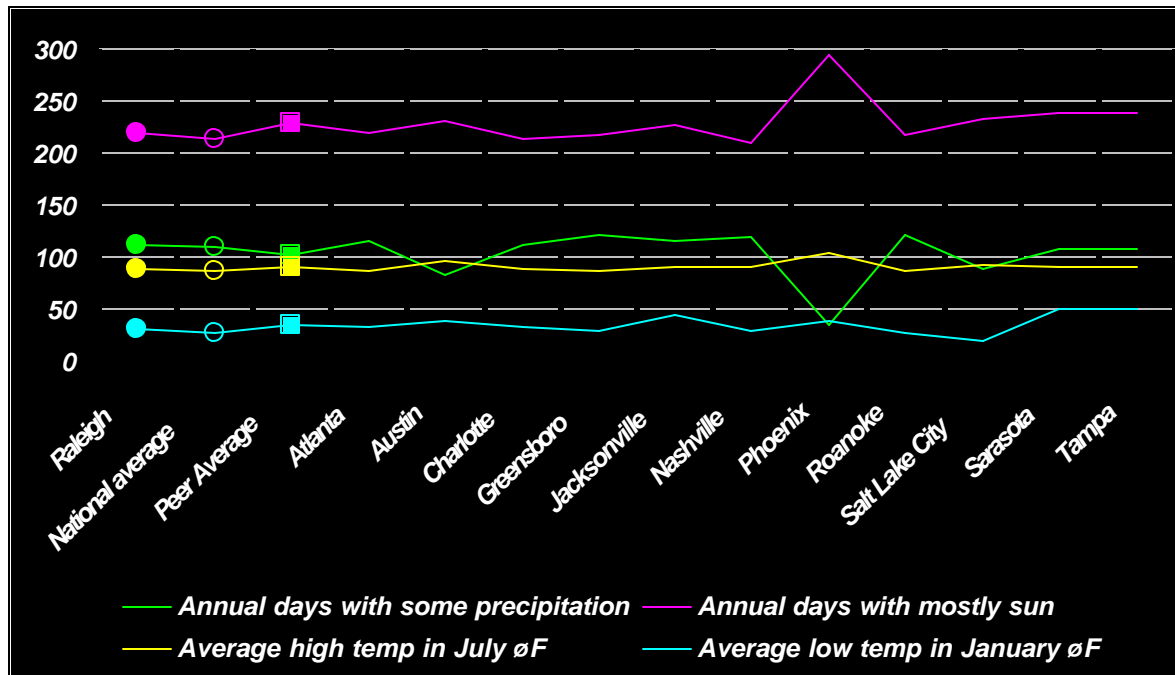
7 <http://www.lib.ncsu.edu/stacks/gis/regional/upneuse/upneuse.html>. This is a great site that allows you to do your own mapping of a variety of topics, like environment, land use, and population. The area includes not only Wake County/CAMPO, but other surrounding counties as well.

7 <http://www.neuseriver.org/>. The Neuse River Foundation offers a lot of insight into the Neuse River and water quality from an advocacy perspective.

7 <http://www.mindspring.com/~tlcpage/>. The website for the Triangle Open Space Conservancy provides good information on open space initiatives in Wake and surrounding counties. This site also links to the *State of Open Space 2000* report prepared by the Conservancy at <http://www.mindspring.com/~tlcpage/os2000.htm>.

*Here are a few Internet sites that can provide you with much more information about our region. Of course, you can always contact the CAMPO staff with specific questions or other information.*

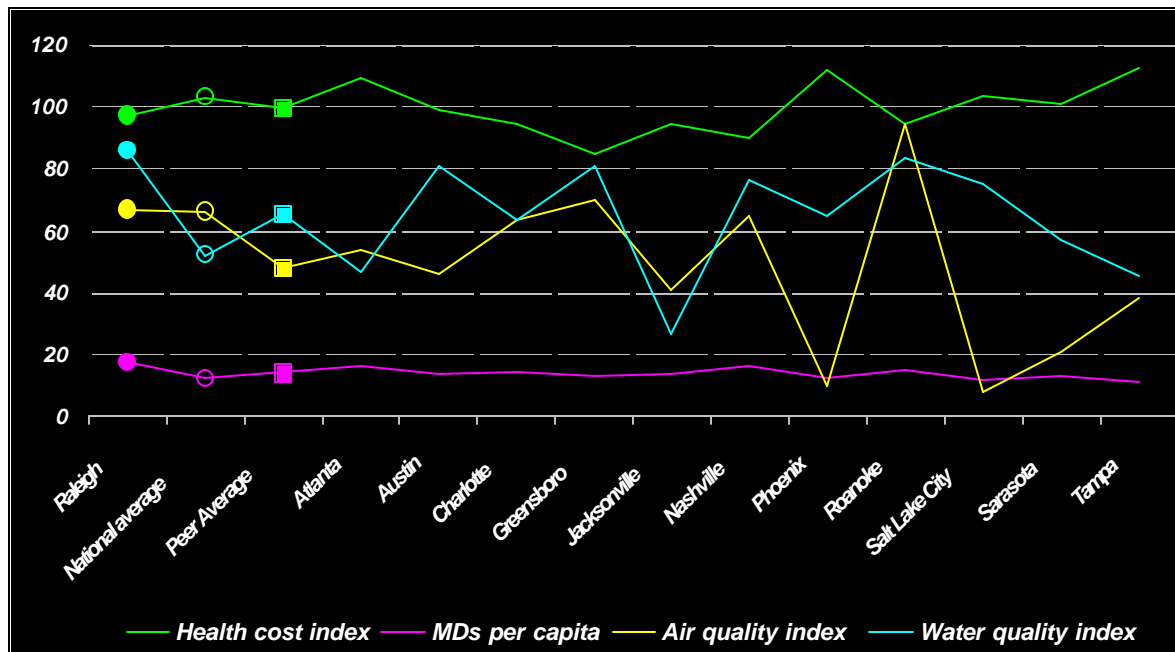
**Scott Lane, CAMPO Administrator**  
**310 West Martin Street, Mezzanine Level**  
**Raleigh, NC 27601**  
**919.831.6790 (t)**  
**919.831.6821 (f)**  
**[lanejs@raleigh-nc.org](mailto:lanejs@raleigh-nc.org)**



**Figure 6. The Climate.**

Favored by a warm climate that gets more than a little humid in the summer months, the region compares favorably for tourists and residents alike with our peers for number of days of sunshine and days of rainfall.

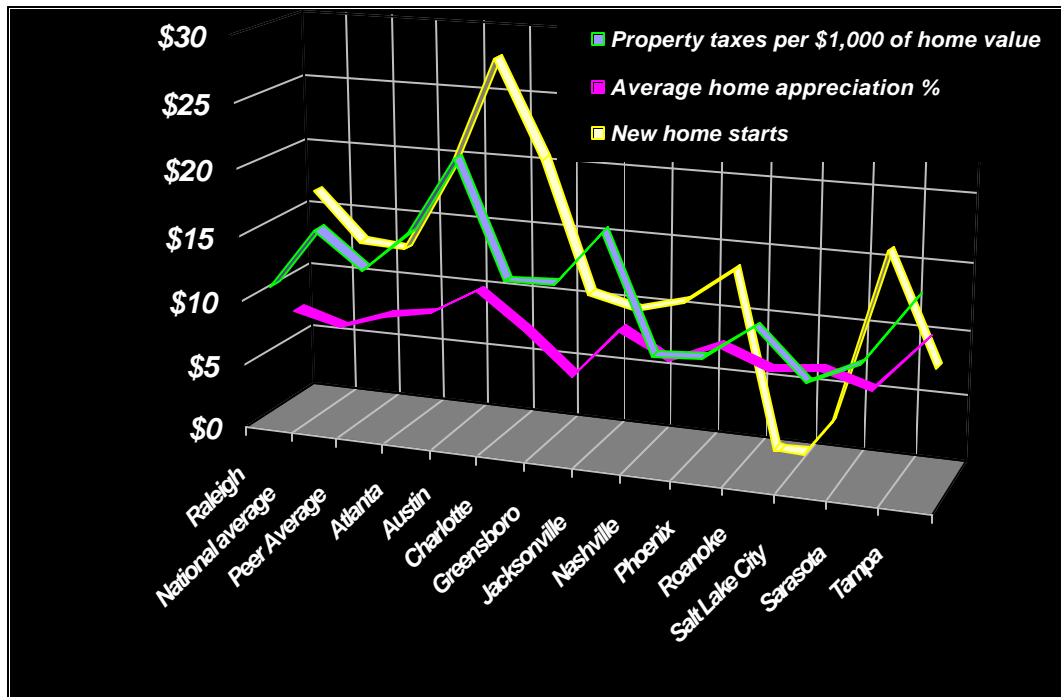
HOW WE COMPARE...



**Figure 7. The Human Health Comparison.**

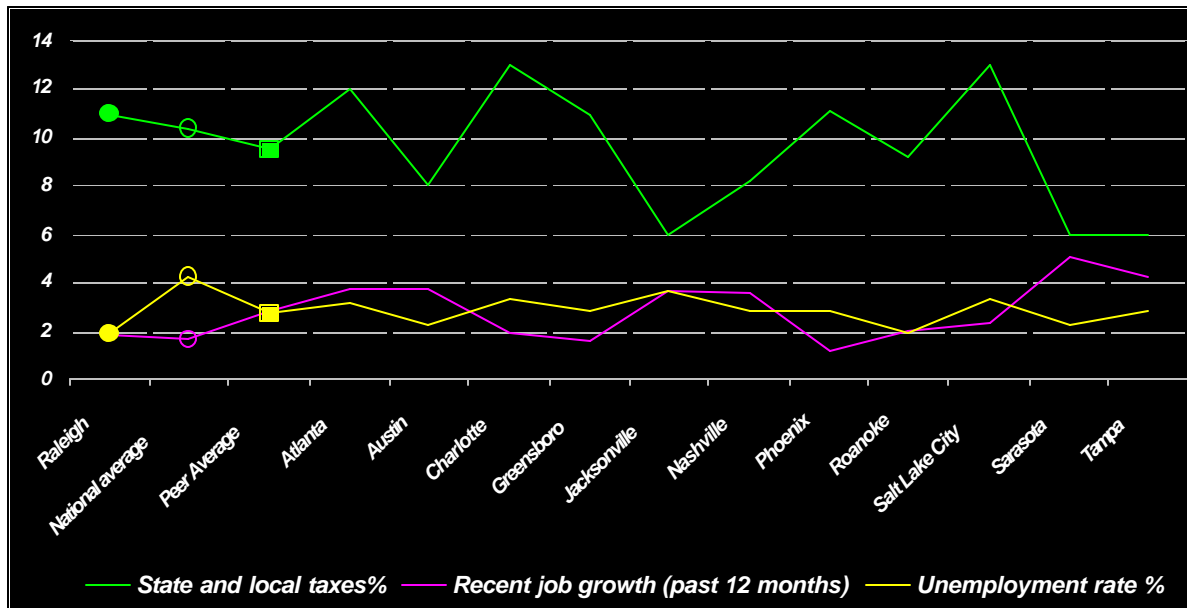
The Triangle metropolitan area has gained increased notoriety for having exceedences of the federal air standards for smog (ozone). As shown, however, our water quality is among the best in the nation and is a great asset to us and our economy. Distribution of this vital commodity has been a problem in the fastest-growing areas of the region, prompting temporary moratoriums on new development.





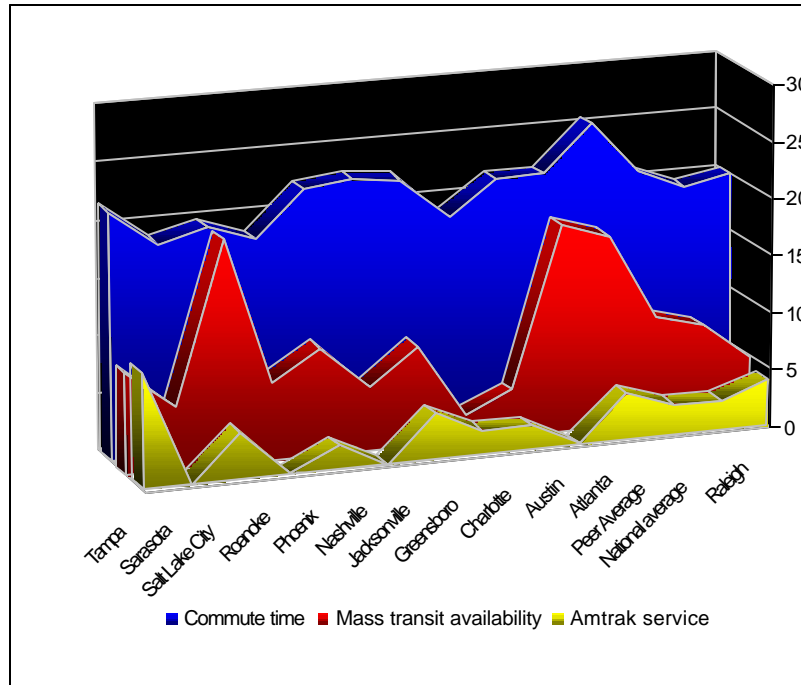
**Figure 8. The Human Health Comparison.**

Low property taxes and relatively high appreciation of home worth make buying property here a generally sound investment.



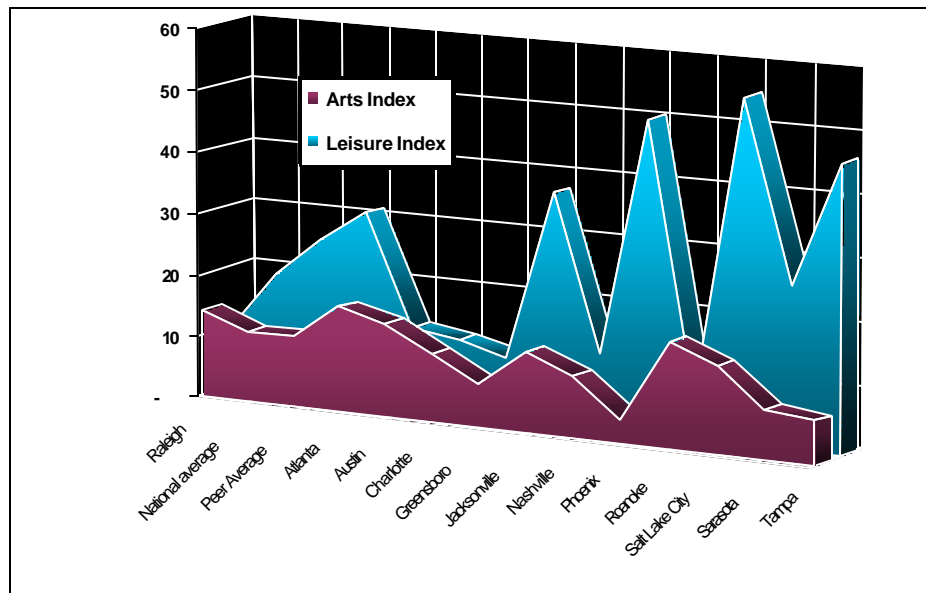
**Figure 9. Taxes and The Economy.**

Although our average taxes are higher than average nationally and with our peers, local taxes vary considerably among our member governments in the Triangle Region. The recent high-tech slump has affected the 12-month performance of new job starts, but our unemployment rate remains very low.



**Figure 10. Transportation Service.**

Amtrak and Greyhound both have a presence in the Triangle, and RDU Airport has experienced solid growth in recent years. Our manner of growth, fragmented transit responsibilities, traditional high level of automobile use and other factors have contributed to the lower score on transit service for the Triangle as a whole. However, Raleigh has a well-established service, the Triangle Transit Authority is expanding its routes in the Capital Area, Wake County has a strong coordinated human services transportation system, and Cary has also started a new service.

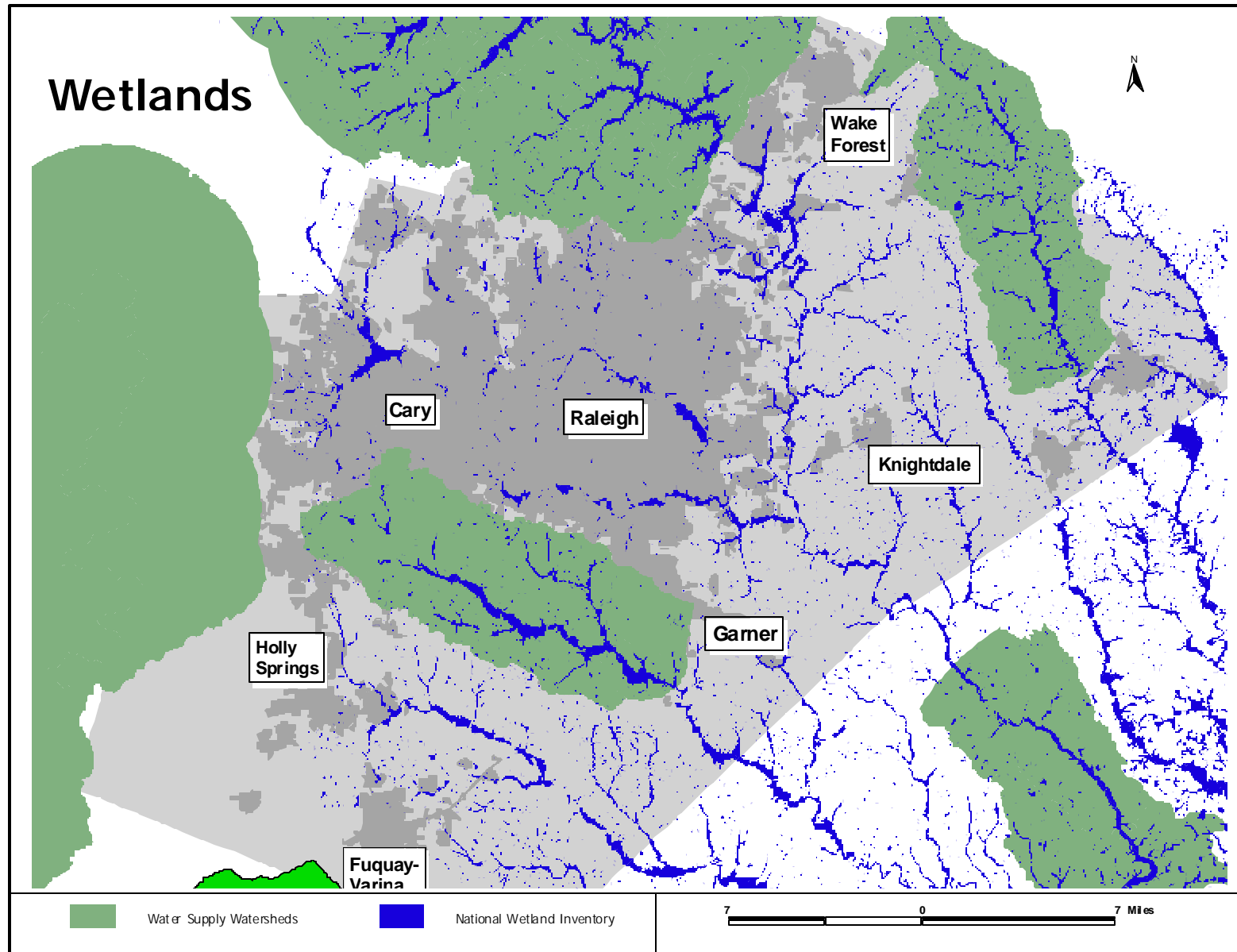


**Figure 11. Arts & Leisure Indices.** A new entertainment and sports arena was recently completed, hosting the Carolina Hurricanes hockey team. Minor league baseball is played in venues on both sides of the region (Zebulon and Durham), and a major expansion of our performing arts hall in downtown Raleigh was also completed recently.

Indicator*		Raleigh	National Average	Peer Average	Atlanta	Austin	Charlotte	Gainesboro	Jacksonville	Nashville	Phoenix	Rosario	Salt Lake City	Sarasota	Tampa
Weather	Annual days with some precipitation	112	110	103	116	82	111	121	116	119	34	121	88	107	107
	Annual days with mostly sun	220	213	230	219	231	214	217	226	210	295	217	232	238	238
	Annual snowfall (inches)	7	24	10	2	1	6	9	-	11	-	25	58	-	-
	Annual days < 32 F	82	88	56	59	23	71	85	12	75	32	92	134	4	4
	Annual days > 90 F	25	38	61	19	101	31	28	82	37	164	20	58	81	81
	Average high temp in July F	88	87	91	87	96	88	88	90	90	105	86	93	90	90
	Average low temp in January F	30	27	35	33	39	32	29	45	29	38	27	19	50	50
Crime	Violent crime per 100K population	561	506	639	720	399	947	576	958	987	603	341	380	634	561
	Property crime per 100K population	5,149	4,329	5,198	5,643	4,493	5,684	5,193	5,656	5,879	6,457	3,233	5,790	4,506	4,689
Housing	Median home price (\$)	164,600	128,572	129,717	126,800	130,100	139,400	127,200	96,900	116,500	127,200	168,300	138,700	126,100	94,800
	Property taxes per \$1,000 of home value	11	16	13	16	22	13	13	18	9	9	12	8	10	15
	Home utility cost index	103	105	96	98	89	97	99	100	95	107	88	80	98	99
	Average home appreciation %	8	7	8	9	11	8	5	9	7	9	8	8	7	11
	New home starts	17	13	13	19	28	20	11	10	11	14	(2)	3	16	8
Education	Spending per pupil	5	5	5	5	5	5	5	5	4	4	6	4	5	5
	Student/teacher ratio	14	17	17	16	14	16	14	19	17	18	17	21	18	18
	Number of 4-year colleges	8	4	9	20	6	12	12	5	12	10	4	3	2	9
	Number of 2-year colleges	5	3	4	9	3	4	5	1	4	14	1	3	1	3
Economy	Cost of Living Index	108	104	100	103	96	100	98	97	95	102	96	107	105	97
	State and local taxes%	11	10	10	12	8	13	11	6	8	11	9	13	6	6
	Recent job growth (past 12 months)	2	2	3	4	4	2	2	4	4	1	2	2	5	4
	Projected job growth (10 years)	25	15	23	23	33	19	15	22	21	28	9	28	31	19
	Unemployment rate %	2	4	3	3	2	3	3	4	3	3	2	3	2	3
	Auto insurance rates (\$ per year)	730	829	827	1,090	860	750	810	770	920	990	740	810	750	700
Health	Health cost index	97	103	99	109	99	94	85	95	90	112	95	104	101	112
	Hospital beds	4,571	2,602	5,015	9,475	2,929	4,215	4,503	3,235	5,572	7,886	1,766	3,616	2,410	10,005
	MDs per capita	18	12	14	17	14	15	13	13	16	12	16	12	13	11
	Air quality index	67	66	48	54	46	63	70	41	65	10	95	8	21	38
	Water quality index	86	52	66	47	81	64	81	27	76	65	84	75	57	45
	Number of teaching hospitals	6	4	6	9	3	5	3	6	5	13	2	8	-	10
Life	Leisure Index	10	19	26	31	13	12	10	37	12	50	7	55	26	46
	Arts Index	14	11	11	17	15	11	7	13	10	4	17	14	8	7
Transport	Commute time	20	19	21	25	21	21	19	22	22	22	18	20	18	22
	Mass transit availability	5	8	9	17	18	4	2	9	5	9	7	20	5	9
	Number of airline flights	158	139	267	1,070	105	372	85	105	228	432	58	272	54	262
	Amtrak service	4	3	3	4	-	2	2	4	-	2	-	4	-	10

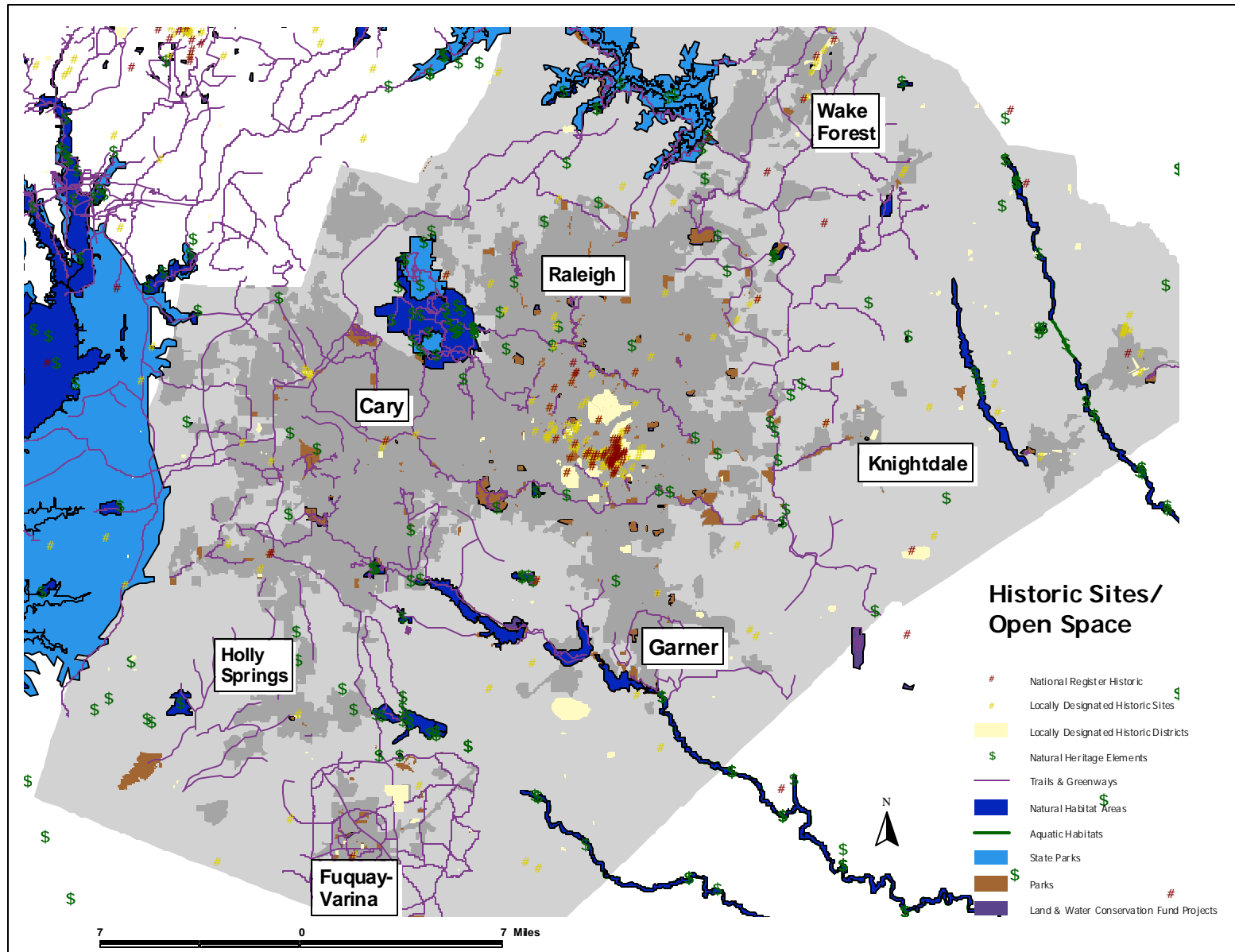
Table 3. Money Magazine Comparison of Metropolitan Areas, May, 2001.\*

\*Source Money Magazine Internet Site, [http://www.money.com/money/depts/real\\_estate/bplive/](http://www.money.com/money/depts/real_estate/bplive/), May 16, 2001.

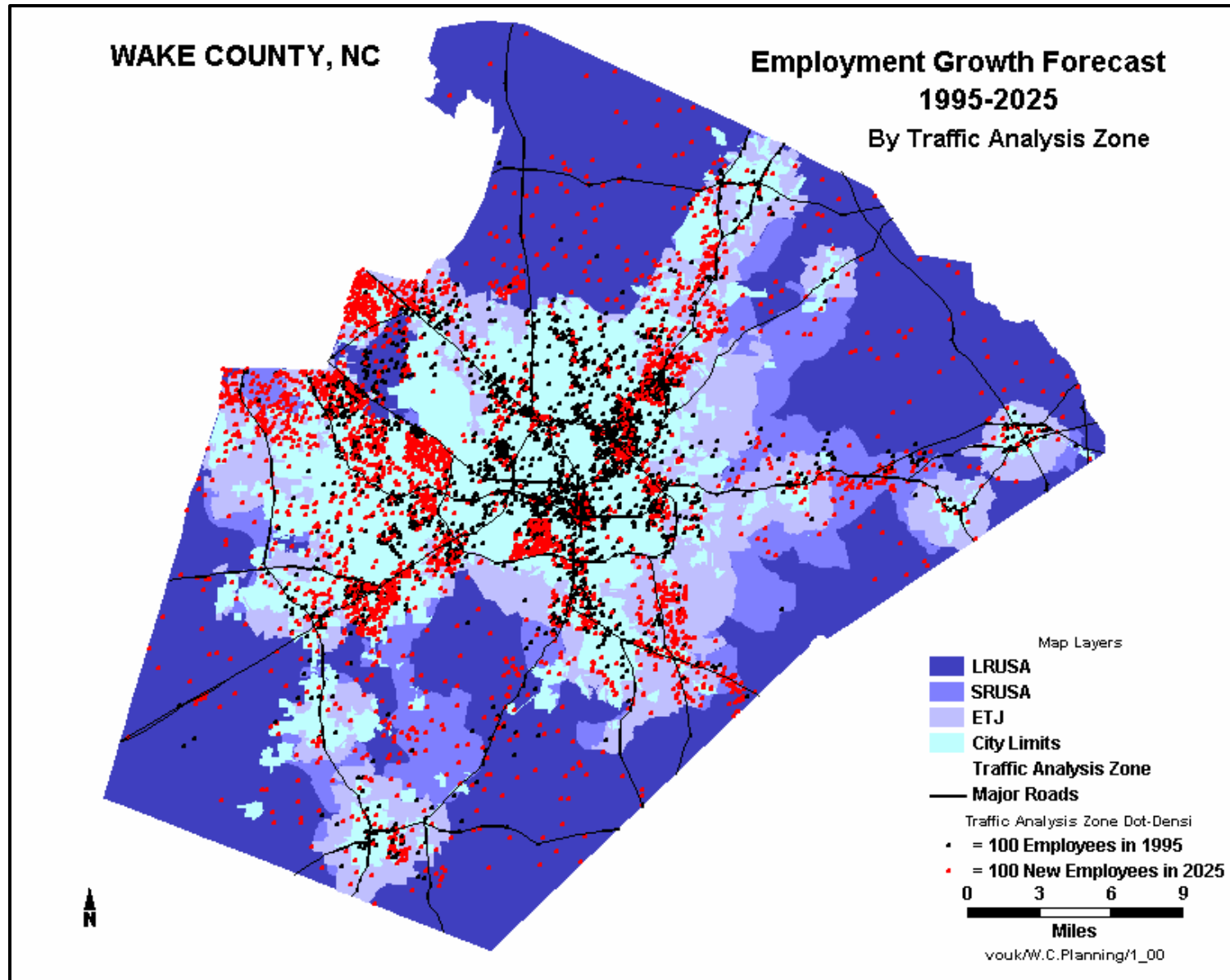


MORE MAPS

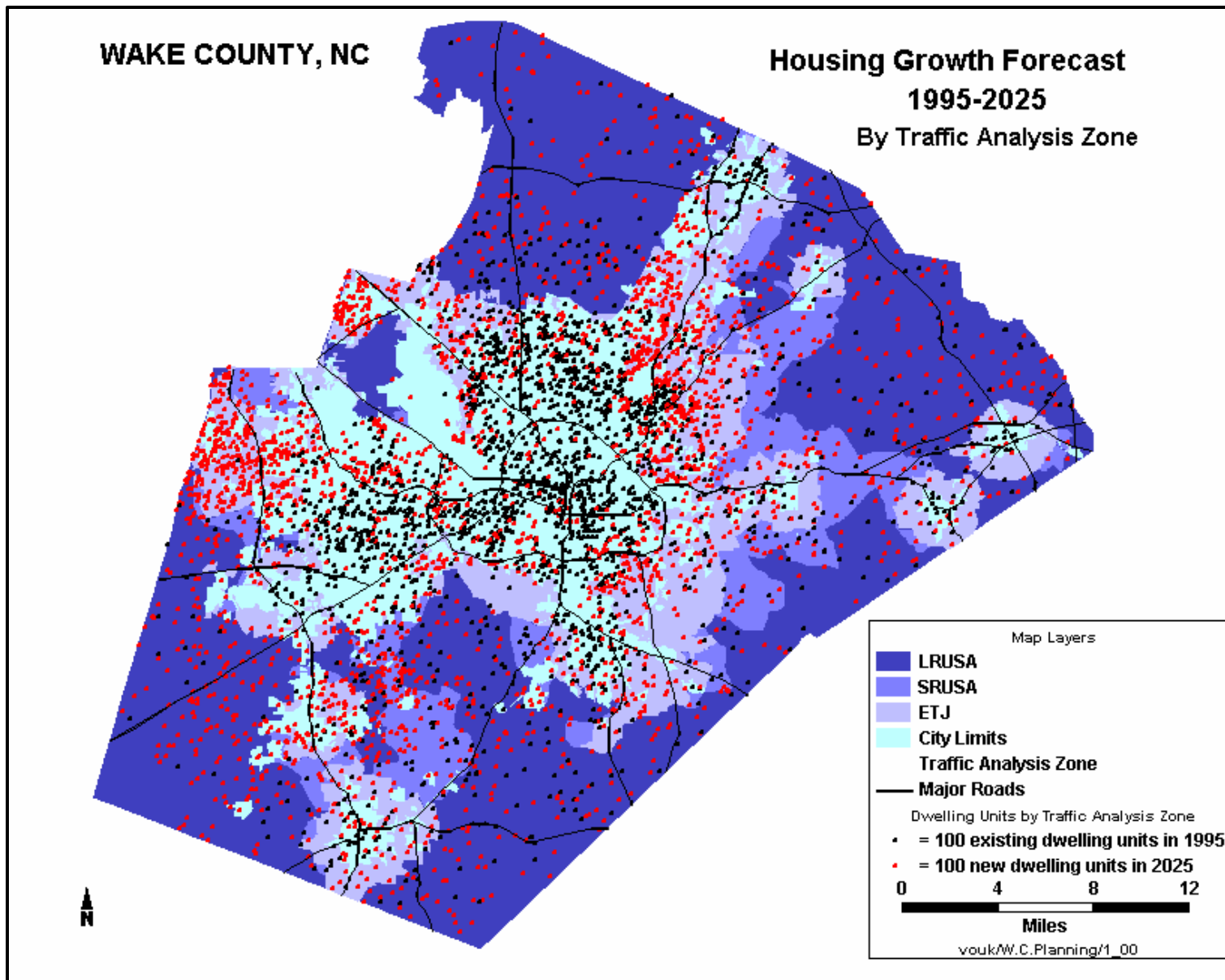
**Designated  
Wetland  
Areas.**



**Historic Sites and Open Space Compared to Municipal Limits.**



**Forecasts of  
Employment  
Growth,  
1995-2025  
Shown with  
Long-Range  
and Short-  
Range Urban  
Service Areas  
(USA).**

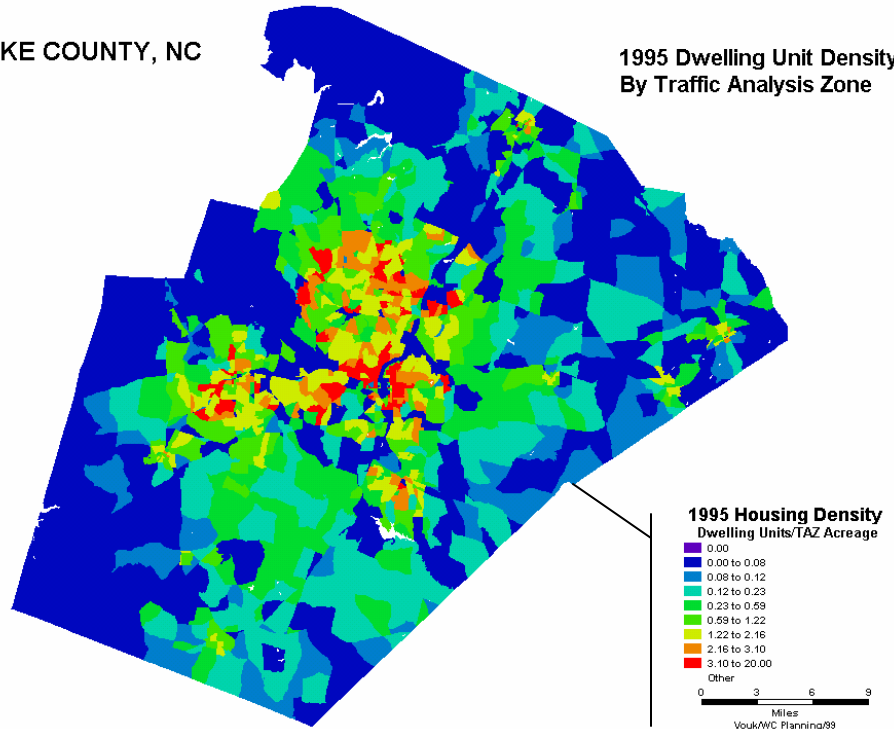


**Forecasts of  
Residential  
Growth,  
1995-2005.**



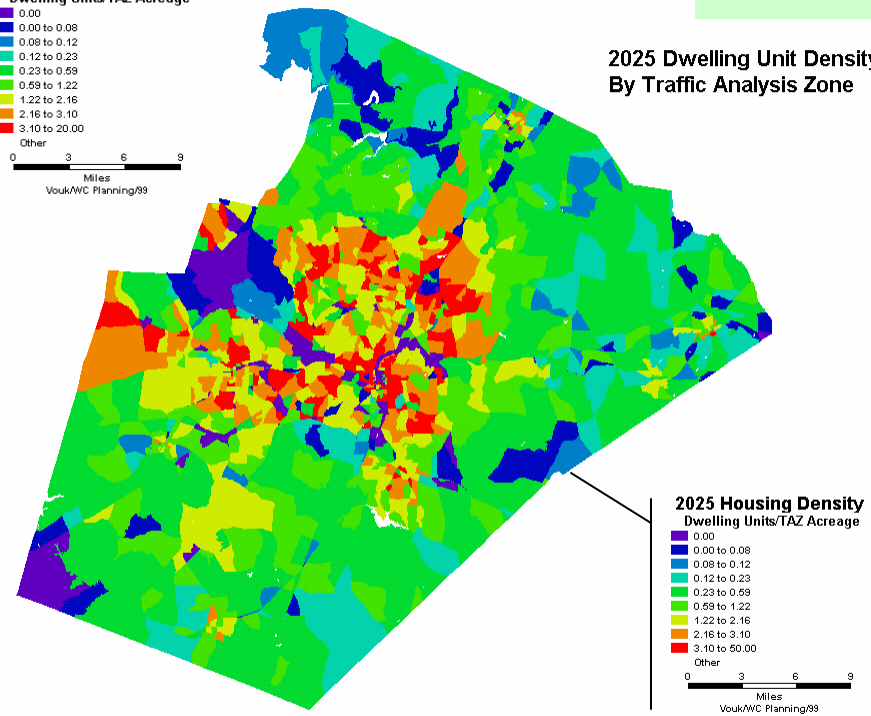
WAKE COUNTY, NC

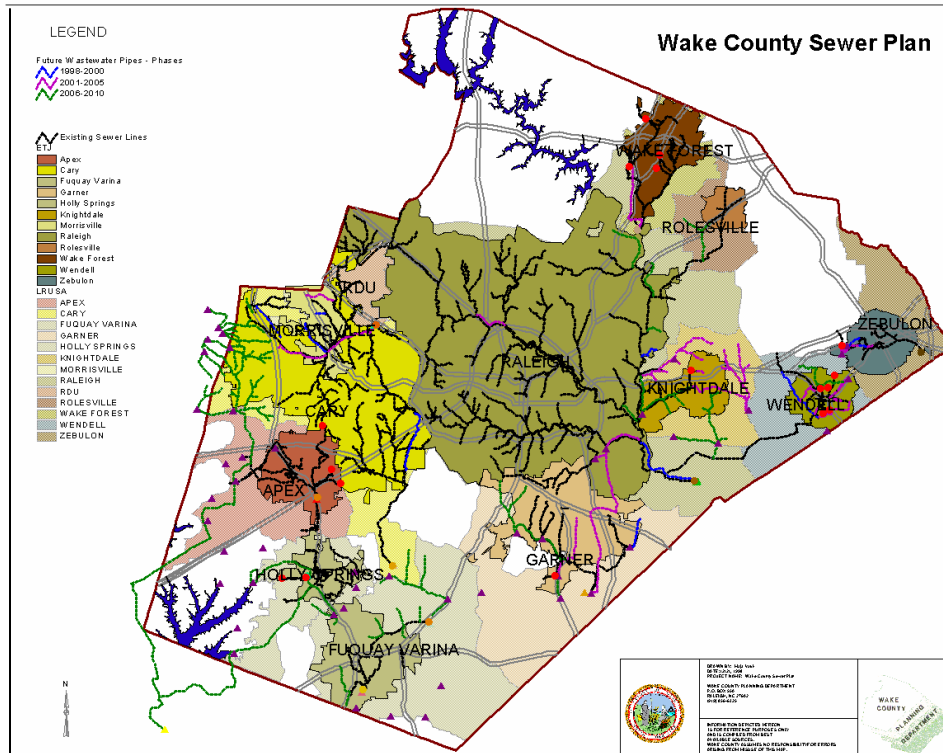
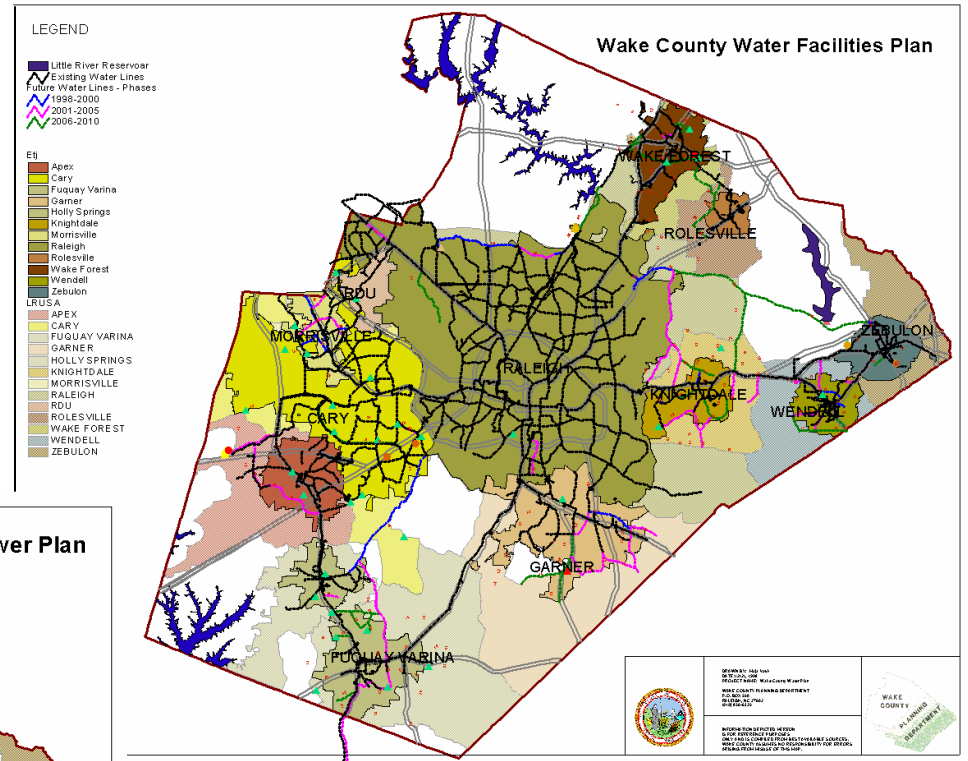
1995 Dwelling Unit Density  
By Traffic Analysis Zone



**Residential  
Density,  
1995 and  
2025.**

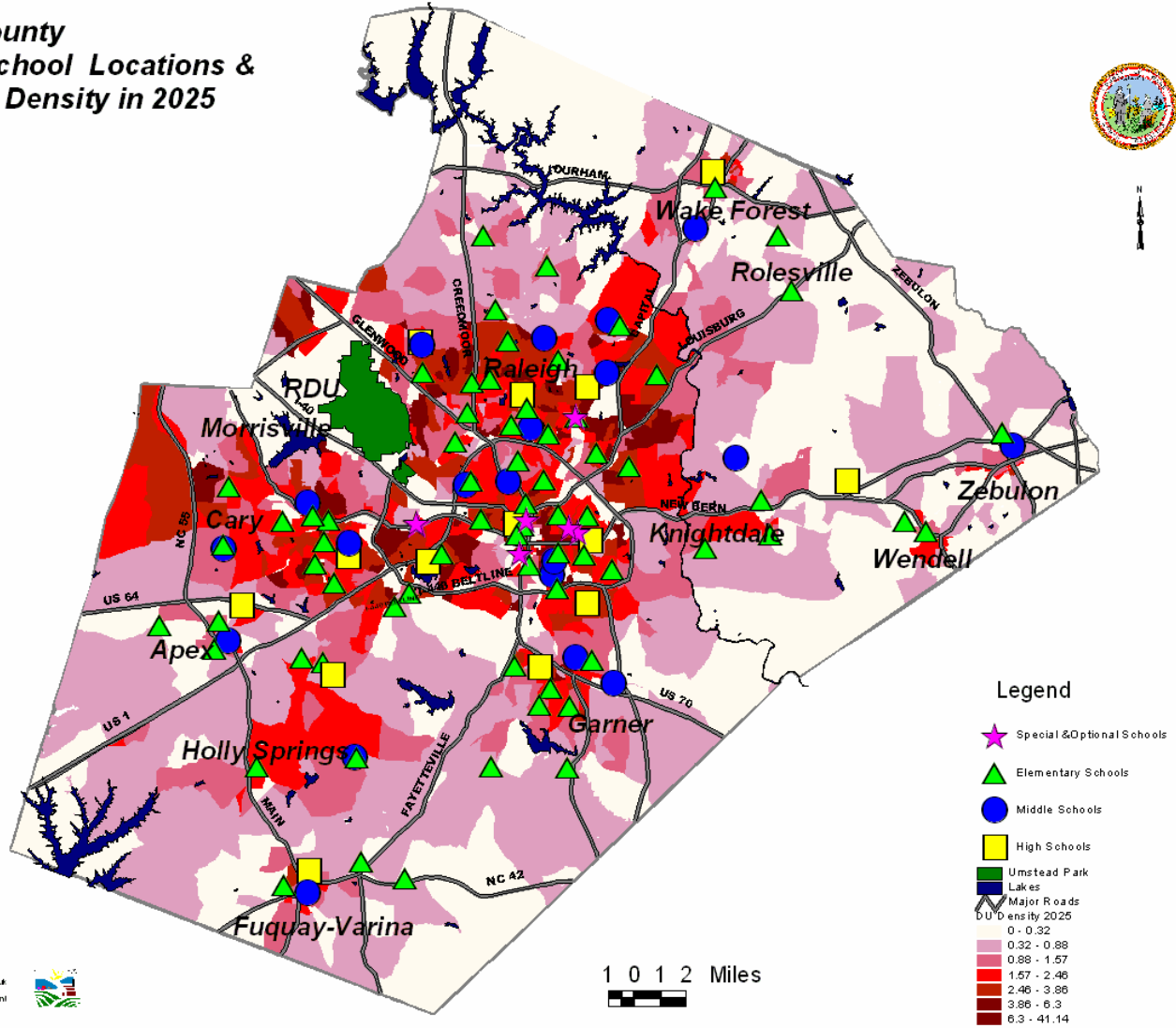
2025 Dwelling Unit Density  
By Traffic Analysis Zone





**Water and  
Sewer Plans.**

# Wake County Public School Locations & Housing Density in 2025



**Current  
Public  
School  
Locations  
Compared  
to 2025  
Housing  
Density.**

**PURPOSE**

The purpose of the Triangle Regional Travel Demand Model (TRM) is to forecast changes in traffic volumes on primary and secondary street systems and public transit systems. These changes may be due to a change in time frame (forecasting future years), or may be as a result of changing a characteristic of the street system, a population or employment characteristic, or some combination of these.

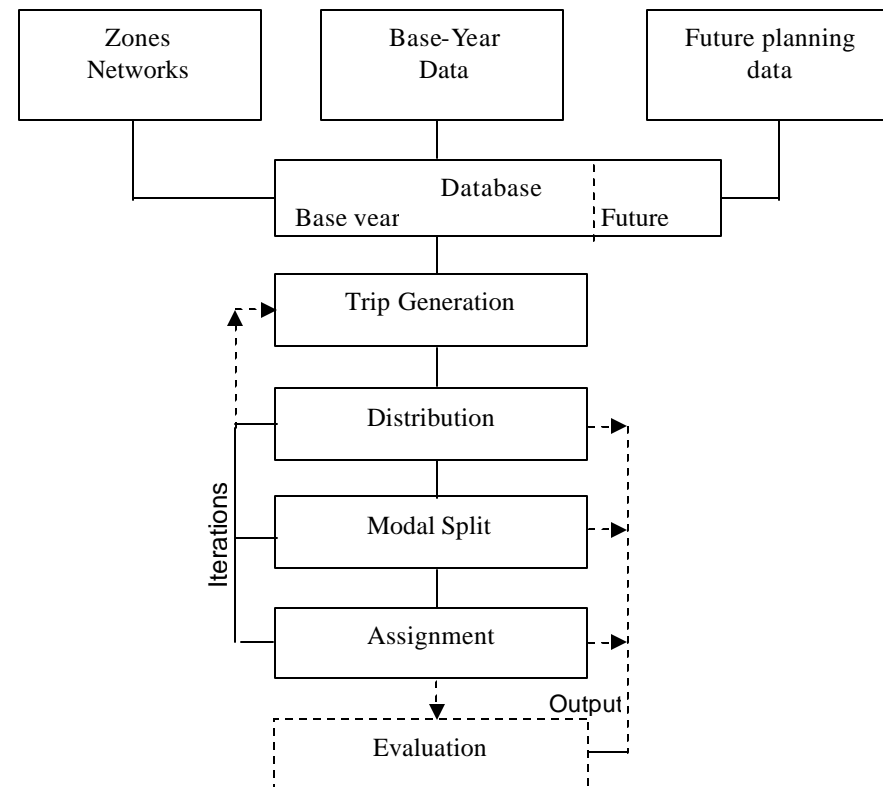
These outputs are important for understanding multi-million dollar investments that affect the lives of hundreds of thousands of people in our area alone. They are also used as important inputs into air quality modeling for our region, so that we can better understand how the way that we develop and grow affects the condition of the air we breathe. But the model is a simplification of reality: it cannot and should not replace sound judgment. The model does not directly address many important considerations, like water quality and the number of homes or businesses affected by a proposed change to the transportation system.

**HOW DOES IT WORK?**

Essentially, when a change is made of the type mentioned above, a model “run” can be made that produces traffic and transit data that can be viewed on a computer screen, such as those maps shown in this report and the *System Monitor*. Color-coded maps can indicate how much traffic is on a facility and how congested that facility is during the morning and afternoon peak hours. All-day traffic and off-peak traffic numbers can be generated from the model as well. Other kinds of maps, called bandwidth plots, can show how many lanes there are for each facility or their posted

speed limits by making some street lines look “fatter” than others.

To do all of this, something called a “four-step” process is undertaken by the computer with help from the computer operator. Each of the first three steps creates new data sets to “feed” into the next step in line. The ultimate goodness of the model is determined by how well it matches the “reality” of actual counted vehicles or transit riders in the base year of the model (in our case, the TRM has a base year of 1995, which is when all the data for the model was collected in a massive undertaking). The following is an excerpt from Modelling Transport,



**The classic four-stage transport model (Ortuzar and Willumsen, 1990, p.24)**

Second Edition by Ortuzar and Willumsen that describes the modeling process:

*“The general form of the model is depicted in Figure 7 [reproduced above]. The approach starts by considering a zoning and network system, and the collection and coding of planning calibration and validation data. These data would include base-year levels for population of different types in each zone of the study area as well as levels of economic activity including employment, shopping space, educational and recreational facilities. These data are then used to estimate a model of the total number of trips generated and attracted by each zone of the study area (trip generation). The next step is the allocation of these trips to particular destinations, in other words their distribution over space, thus producing a trip matrix. The following stage normally involves modeling the choice of mode and this results in model split, i.e. the allocation of trips in the matrix to different modes. Finally, the last stage in the classic model requires the assignment of the trips by each mode to their corresponding networks: typically private and public transport.”<sup>1</sup>*

#### HOW ACCURATE IS IT?

As previously mentioned, the accuracy of a model is often determined by how well it replicates actual counted cars or transit riders at a particular point or on a certain street. This can be done by comparing all of the counts along an imaginary line that captures regional traffic flows on several, generally parallel streets (screenlines or shorter cutlines), comparing counts on all of the similar types of facilities (i.e., all freeways, all major arterials, etc.), or comparing the number of riders on a transit route or system. Regardless, one is always comparing actual recorded counts with those predicted by the travel demand model.

The Triangle Regional Model meets or exceeds in excess of 90% of the targets (the acceptable level of error) that was set for it by a joint committee from the Durham-Chapel Hill-Carrboro and CAMPO MPOs, and NCDOT. Generally, as the actual volumes on a street or system get smaller, the relative percent of error increases as well. The table on the next page shows measures of accuracy for the Triangle Regional Model in its first version, and the currently adopted version that was used to test the alternative scenarios and air quality analysis in this report.

As time goes on, improvements to the TRM will be made that will improve the accuracy of the outputs. As it stands now, however, the TRM marks a significant milestone not only in technical achievement with the range of options that it can test, but is also a landmark achievement in regional cooperation among local and state agencies.

The Capital Area MPO continues to assist its regional partners with development and improvements to the Triangle Regional Model. We are committed to providing staff and financial support to help direct the model the way we and our customers think best improves the planning practice.

---

<sup>1</sup> Ortuzar and Willumsen, Modelling Transport, Second Ed. (West Sussex, England: John Wiley and Sons), 1990, page 24.

For more information about the TRM and modeling in general:

Modelling Transport, Second Edition, by Ortuzar and Willumsen, is available through special order at university bookstores.

Fundamentals of Transportation Engineering, by C.S. Papacostas, is available through special order at university bookstores.

Calibration and Adjustment of System Planning Models, by Ismart et. al., is available by contacting the Federal Highway Administration.

Cutline (imaginary line "cutting" across several roads)	Assigned	Count	Assigned/Count	Target %	Modeled (v1.0) %	Modeled (v5-2001) %
SW Durham (no. 1)	117421	118374	0.99	+/- 10%	-5%	-1%
Durham (no. 2)	398172	375322	1.06	+/- 10%	6%	6%
Northern DCHC (no. 3)	254496	268814	0.95	+/- 10%	-9%	-5%
Johnston Co. (no. 4)	115135	100016	1.15	+/- 10%	15%	15%
Chatham Co. (no. 5)	24704	21292	1.16	+/- 10%	16%	16%
N. Raleigh (no. 7)	369608	404136	0.91	+/- 10%	-9%	-9%
Eastern Wake (no. 8)	140316	143248	0.98	+/- 10%	-3%	-2%
US 1 S (no. 9)	127341	129710	0.98	+/- 10%	-10%	-2%
N. Wake (no. 11)	63623	59998	1.06	+/- 10%	6%	6%
US 70 (no. 12)	93765	86334	1.09	+/- 10%	10%	9%

Facility Type	FHWA Targets (+/-) <sup>1</sup>	Triangle Targets	Modeled (v1.0)	Modeled (v5-2001)
Freeway	7%	5%	11.6%	10.5%
Major Arterial	10%	8%	1%	-0.6%
Minor Arterial	15%	10%	1%	-0.6%
Collector	25%	15%	-6.5%	0.2%
Locals	25%	15%	9.6%	-14.2%

Volume Group	Counted Volume [1,000s]	Assigned Volume [1,000s]	Assign /Count	Model (v1.0)	Model (v5-2001)	Target <sup>2</sup>
< 1,000	60.7	57.7	0.95	1%	-5%	55%
1,000 - 2,500	461.5	447.6	0.97	4%	-3%	50%
2,500 - 5,000	1355.2	1331.5	0.98	-2%	-2%	30%
5,000 - 10,000	1803.1	1833.6	1.02	-1%	2%	25%
10,000 - 25,000	2356.2	2425.8	1.03	6%	3%	20%
25,000 - 50,000	690.5	680.0	1.00	-5%	0%	15%
> 50,000	520.6	508.9	0.98	-4%	-2%	10%
Total	7244	7294	1.01	1%	1%	5%

Sources: <sup>1</sup>FHWA, *Calibration and Adjustment of System Planning Models*, 1990

<sup>2</sup>Barton-Aschman Associates, Inc. and Cambridge Systematics, Inc., *Model Validation and Reasonableness Checking Manual*, February, 1997

### **Accuracy of the Triangle Regional Model, and Compared to Earlier Version.**

General Overview

During the second quarter of fiscal year 1999, the Capital Area MPO (current population: 620,000) prepared a financial plan as part of its long-range transportation plan update. This particular plan update was concerned with developing a description of our current trends, their impacts, and of course, their costs. We realized that this topic was of great interest to our policy board, and therefore a significant effort was placed into this piece of work. An additional emphasis was placed on alternative revenue sources (as differentiated from traditional state, Federal, local, and private revenues), and KPMG Peat Marwick was subconsulted under Parsons Brinckerhoff for this element of the plan. This paper treats only the method and assumptions used for developing the traditional revenue streams and additional cost summary.

STEP 1. Addressing Data Requirements.

It is assumed that some way of disaggregating county and statewide figures to fit the MPO's area can be applied that is reasonable. Where this is not obvious, I have suggested a method for doing so. To make this report easier to read, the data sets will be referred to by their number in Table 1 from this point forward (e.g., Data Set 1 refers to the TIP calculations shown in Table 1).

STEP 2. Calculate the Unadjusted State and Federal Expenditure Forecasts.

Using Data Set 1, use the FORECAST function in MS-Excel to forecast the figures to the desired horizon year. This is the "unadjusted" forecast.

STEP 3. Breakout of Expenditure Types from Unadjusted State and Federal Forecasts.

Using Data Set 1, find an average percentage of funds expended on highway projects, bridges, interstate, rail, rail passenger, and other types of funding categories (for example, Enhancement and High Hazard Elimination projects). The level of detail here is at the discretion of the analyst, but it is suggested that roadway, bridge, and rail projects be broken out, at a minimum. Apply these percentages to each year of the forecast. You should have a table with columns like this:

Year	Expenditure\$	Highway\$	Interstate\$	Rail\$
1994				
1996				
1997				
.				
.				
.				
Horizon Year				

Step 4. Adjust for Inflation and External Funding Factors.

On the same spreadsheet as the results from Step 3, make a copy of the table and place it immediately below the first table. Make three new columns to the right showing the compounded inflation rate and the relative state and Federal contributions to the TIP. CAMPO used a 3:1 ratio for state/Federal funds in the base year of 1995. For each year, move the relative ratio up (or down) depending on the factors that may lie outside past trends. These may include: TEA21 increases (Federal side) and increases in fuel tax revenue due to dispersed growth patterns (state side). The compound inflation rate is developed (for an example of 3%) by multiplying the previous factor by 1.03 for each year.



To use the adjustment factors, simply multiply the appropriate figure in cell xx by the adjustment factor, and place the result in cell xx of the adjusted table (the table that you copied from the original). The state/Federal ratio adjustment factor is applied by dividing the sum of the adjustment factors for the year in question by the sum of the adjustment factors for the base year. For example, if in year 1995, the state/Federal ratio was 3:1, and in year 2005 the state/Federal ratio was 3.2:1.5, then the adjustment factor would be  $(3.2+1.5)/(3+1) = 1.18$ . Note that the state/Federal scale adjustment and inflation are two distinct factors.

Step 5. Forecast the Maintenance Revenues.

Using Data Set 5 and the MS-Excel FORECAST function, trend the new road miles constructed in your area. Apply the linear maintenance cost shown in Data Set 5 to these road miles. An estimate of road miles in a MPO jurisdiction may be needed to apportion expenses for these countywide figures used in Data Set 5. Inflation-adjust as before.

Step 6. Calculate the Private Funding.

Estimating private funding from past trends is extraordinarily problematic, and will contain a large degree of error. In no place in the CAMPO Financial Plan will anyone see anything less than a 10-year sum of private funding – no annual funding figures are shown (the closest thing to this is a 30-year “average” funding figure).

CAMPO assumed that private funding was tied to growth in the number of residences and employees over the planning period. For every 100 new residences or 50 new jobs created, \$20,000 was contributed directly and immediately to primary system road improvements (such as signal installations/upgrades and deceleration lanes). No attempt was made to “trend” past public/private

partnerships – the historic data is sparse and the likelihood of accuracy would not be increased by doing so.

Create a table showing yearly increases in dwelling units and employees. Multiply each new dwelling unit and each new job by a dollar amount that is reasonable to assume for value added for transportation improvements. CAMPO used \$200 for each new dwelling unit, and \$400 for each new job created. Accumulate these to 10-year increments. Adjust for inflation as described in Step #4 by inserting a new table immediately below the one you just created. You may wish to make it easy for the user to modify the value added multiplier, as different scenarios may wish to be tested by your technical board.

Step 7. Forecast Powell Bill Funding.

NCDOT has excellent records on Powell Bill monies that can be tapped with a telephone call. For each town, you should forecast the Powell Bill Funding by using the growth in residences to estimate population growth, which comprises three/fourths of the Powell Bill formula. You may also wish to observe the trends in Powell Bill funding, and if these seem to indicate a smooth change then applying the MS-Excel FORECAST function may be more desirable. Once again, inflation-adjust the entire table by making a copy and pasting it immediately below the original. Apply the inflation factor as before.

Step 8. Forecast the CIP Funding.

CIP funding was simply forecast from past data collected individually from each municipality. Make sure not to duplicate Powell Bill monies (generally used for maintenance in small towns, and maintenance and sidewalk construction for larger towns and cities) in the CIP historical data. One additional way of refining this data set is to break out the funds received by each town or city from impact fees, as these can be expected to reasonably follow growth trends. CAMPO did not find this

to be particularly helpful, as only two municipalities in its planning area currently utilize impact fees.

Use MS-Excel's FORECAST function to calculate the future-year, expected revenues from local CIPs. Inflation-adjust as done in previous steps.

**Step 9. Forecast Transit Funding.**

Transit funding was obtained from the City of Raleigh, the Triangle Transit Authority (TTA), and Wake County Human Services. These trends were simply projected into the future using the MS-Excel FORECAST function. For certain TTA funding elements, such as bond issuances and unsecured funding sources, these trends were not carried forward. As a closed system, NCSU funding was not identified in this analysis. Inflation-adjust as in previous steps.

**Step 10. Identify Any Deviations From Past Trends.**

When steps 1-9 are completed, then you will have an estimate of revenues from all the major traditional sources: state, Federal, local, and private. However, if there are future costs (or revenues) that are not covered in past trends, then these should be identified separately.

Don't forget to show the maintenance costs for new construction when estimating the total costs. This can be done crudely by applying a maintenance factor that is the product of the linear maintenance costs (Data Set 5) times a degradation factor for each horizon year times the number of road miles completed in each horizon year (Data Set 8). The degradation factor tells you how much to factor down maintenance on a new road. Therefore, a road built in 2005 may have only 20% of the typical linear cost for that type of road, but in 2015 that same facility may be up to 80% of the typical linear maintenance cost.

<b>Data</b>	<b>Ease of Acquisition</b>
1. TIP expenditures for at least five years, with relative percentages expended on transit, safety, passenger rail, rail crossing, and bridge improvements, as well as rural/urban and interstate projects. This must be calculated by hand, comparing prior years' expenditures between TIPs.	The amount of detail desired in the analysis (i.e., breakouts for different modes and types of expenditure will determine how difficult this is to calculate)
2. Powell Bill funds for seven years for every jurisdiction in the study area (that participates in the Powell Bill distribution).	Very easy
3. Capital Improvement Program (CIP) expenditures for every town and city in the study area. Many small towns will not expend money on transportation improvements or maintenance except through the Powell Bill funds (see Data Set 2).	Moderate (depends on number of municipalities)
4. Residential and Employment growth projections for each forecast year.	Moderate to difficult, depending on how many county boundaries the MPO boundary crosses.
5. Maintenance Expenditure Reports	Easy
6. Report: Condition Assessment & Funding Needs for the NC Highway System	Easy
7. Inflation Factor	Easy (Suggest 3%) to Moderate (if ROW costs are factored separately, for example)
8. New Projects and Project costs coming on-line during the forecast period. These should be broken out in increments, e.g., 1995-2005, 2005-2015, and 2015-2025.	Easy to moderate. The project-year assignments should be approved by the MPO

**Table 1. Data Requirements.**

## **CAMPO STAFF REPORT**

prepared by: J. Scott Lane, CAMPO Administrator  
for: *Transportation Plan Update 2025* File



5/29/2002

### **SUBJECT: Public Involvement Summary for TPU25 (April 9, 2002)**

---

This report identifies public outreach efforts and responds to comments received from the public involvement effort for the *Transportation Plan Update 2025* project to date (April 8, 2002). This report will be updated and included in the appendix documentation for the final *Transportation Plan Update 2025* report.

This report has three parts:

1. Responses to comments received;
2. Chronology of public outreach efforts (this includes open, major district meetings or workshops targeted to CAMPO members); and
3. Specific written comments as they were received by CAMPO.

CAMPO's public involvement policy cites minimum requirements for its public involvement practice for several major operations of the MPO, including updates of its long-range transportation plan (LRTP). CAMPO went well beyond those minimum requirements in attempting to solicit public comments on the LRTP:

- Web-based surveying and website updates
- Paper-based and digital newsletters
- Developing an email and paper-based list of contacts
- Conducting six public workshops and a public hearing during March and April, 2002
- Advertising in the *Raleigh News & Observer*, *Carolinian*, and *La Conexion* newspapers
- Sending out press releases to 40 media contacts via the City of Raleigh Public Affairs Office
- Advertising in Spanish formats
- Asking our members for contacts, especially in low-income and minority communities
- Speaking at local governments and civic organizations

CAMPO believes that these efforts were moderately successful, but does recommend de-emphasizing workshops in favor of directed outreach at public gatherings and events. CAMPO staff also recommends keeping a "running tab" of comments that are received, rather than waiting until the end of a specific update to focus on public involvement. Finally, CAMPO staff strongly recommends that public involvement migrate to a less intense but more continuous form of involvement with the public to ensure that everyone has a voice in the Capital Area's transportation planning process. This should also address the issue of "running out of time" to respond to issues brought up near the end of the report update process, which is now being driven increasingly by air quality conformity deadlines.

## PART I. RESPONSE TO SPECIFIC COMMENTS

Comments were received from numerous sources, including email, verbal, and written comments received at public workshops conducted around the Capital Area in March and April, 2002. Written comments have been attached to this document (Part III).

No.	Comment
1.	Complete the I-540 "Outer Loop" project on, or ahead of, schedule. <i>Numerous commentors expressed the desire to see the entire I-540 Outer Loop project completed and shown in the L RTP. Two commentors (see also comment #16) expressed a desire not to complete I-540, but instead spend the funds elsewhere, especially on transit or other automobile alternatives. The supporting comments were primarily from local governments and Chambers of Commerce expressing a variety of concerns about negative effects to local economies and mobility. <b>The entire Outer Loop project is shown in the L RTP as being completed no later than 2025.</b> Several commentors also expressed a desire not to widen local roads (e.g., Ten-Ten Road and Holly Springs Road). Due to traffic mitigation effects, the <b>L RTP does indicate that some arterial roadways will need to be widened</b>, even with the inclusion of the I-540 Freeway facility. The L RTP does indicate that an alternatives and impact study should be completed on this project as soon as possible, in order to address environmental and indirect/cumulative development concerns. CAMPO staff believes that this may be done as a part of, or in conjunction with, the Draft Environmental Impact Statement process scheduled to recommence in 2002.</i>
2.	Either do not show the Cary Parkway Extension to Trinity Road at all (delete from draft L RTP), or show it as a two-lane facility. <i>Several commentors indicated that the Cary Comprehensive Plan indicated this as a two-lane facility, in contrast to what is indicated on the CAMPO long-range transportation plan. <b>CAMPO staff has agreed with Cary to show this as a two-lane facility</b>, with a footnote in Appendix A (project list) that indicates this may be moved to a four-lane facility at some point in the future, as traffic demand warrants.</i>
3.	Indicate Trinity Road (between Trenton Road and NC 54) as a two-lane road. <i>The Cary Comprehensive Transportation Plan indicates this as a 2-lane (2005), 4-lane (2015), and 6-lane (2025) facility, expanding over time. <b>CAMPO staff concurs with the Town of Cary staff that the four-lane cross-section is the correct width to show on the L RTP</b>, noting that the cross-section may expand in future updates of the L RTP.</i>
4.	Objections to Reedy Creek area (Cary) developing as a "Regional Activity Center." <i>One commentor, although not supporting specific recommendations to transportation facilities in the L RTP, indicated that developing the Reedy Creek area was inconsistent with the Town of Cary's development guidelines. The CAMPO L RTP does state that (1) providing infrastructure in undeveloped areas should generally not take a priority; (2) transportation plans should be coordinated with water/sewer planning; and (3) there are provisions for controlling access and minimizing harm where it is possible and prudent to do so. However, land development is an issue largely under local government control with the MPO playing at most an advisory role as it affects transportation facilities. <b>CAMPO recommends remanding this to the local review process.</b></i>
5.	Durant Road/Perry Creek Road left-turn lane is too short to accommodate queues. <i>One commentor expressed frustration at having an inadequate left-turn storage capacity from westbound Perry Creek Road to southbound Capital Boulevard. <b>The City of Raleigh Capital Improvement Program does indicate that Perry Creek Road will be widened in this area in a \$6.947 million project.</b> However, the North Carolina Department of Transportation may undertake a minor improvement to address the left-turn queuing problem on these State-owned and maintained facilities prior to this Phase II Raleigh CIP project.</i>
6.	Remove Duraleigh/I-40 Connector project from the L RTP. <i><b>This proposed facility has been removed from the L RTP.</b> Additional options, including capacity increases on US 70 (Glenwood Avenue) are included in the L RTP.</i>

No.	Comment
7.	Commentor supports Choice Focus and Managed Choice alternatives, linking land use and transportation facilities together.
	<b><i>The LRTP closely resembles the Managed Choice strategy that was approved in October, 2001 for review. Land use permitting is largely a function of local government, but CAMPO should serve as a support agency for growth management and guidance, should the local government agree to pursue that option.</i></b>
8.	Include walking, biking, and transit in the LRTP.
	<i>Two commentors expressed support for more bicycle and pedestrian facilities, citing their benefits to individual health, air quality, and low cost, among other statements. A Bicycle/Pedestrian Task Force is now underway, and will present recommendations for inclusion/amendment in the LRTP after it is approved. After this, CAMPO would like to appropriate funding to begin implementing locally-supported projects that fit into the LRTP.</i>
9.	Criticism over TTA Phase I Rail over financing, data collection, and potential efficiency of system.
	<i>CAMPO has reviewed, in detail, the Phase I TTA Regional Rail Project at every phase of its development, including the Draft Environmental Impact Statement. The Triangle Transit Authority has been responsive to requests for information. CAMPO does recommend bringing this item to both boards for additional presentations/discussions to ascertain the current status of the project and stations area planning efforts now underway in the Capital Area. <b>The LRTP does support the Phase I Regional Rail project from Spring Forest to Durham.</b> The LRTP states that this is a corridor that has significant congestion even under the most intensive highway development scenario, and thus considers this area to be a strong candidate for transit alternatives such as the Phase I Regional Rail project. Additional considerations such as promoting sustainable development patterns are also recognized as indirect benefits to transportation.</i>
10.	Greenfield Parkway/Timber Drive Ext. needs to be completed as soon as possible (before 2015).
	<i>CAMPO concurred with the Town of Garner that this facility should be shown as completed before 2015, but did not advance the project to 2005 because of lack of funding.</i>
11.	Wake Tech Community College would prefer that the Southern Wake Freeway crosses US 401 south of the campus.
	<b><i>CAMPO staff has verified that the existing, protected alignment for the I-540 project is still north of the campus at US 401 and informed Wake Technical College of this information.</i></b> However, final alignment will depend on the results of environmental avoidance efforts during the Environmental Impact Statement (EIS) process, scheduled to begin this year.
12.	Monorail service should be considered in the Capital Area.
	<i>One commentor asked if monorail service had been considered in the Capital Area to address congestion and provide mobility alternatives. Although the only formal study that CAMPO staff is aware of is the NC State University proposal to connect the north and south campuses, <b>additional opportunities may exist to study this as an alternative for connecting the RDU airport to the Phase I Regional Rail Project (alternatives study is underway), or with the corridor alternatives study proposed in the LRTP.</b></i>

13.	Remove Cary-Gorman St./I-440 connection.
Staff received several requests to remove the proposed connection of Cary Parkway to Gorman Street at I-440. The majority of the concerns raised were directed at protecting the watershed, although one commentor did express a concern about possible community/homeowner impacts. The Capital Area MPO removed the longer, proposed facility that connected Cary Parkway to Garner on the basis of these concerns. The proposed roadway is shown as a partially-controlled access facility to further minimize secondary developments that would negatively impact the Swift Creek watershed area. Tryon Road is being widened now to a five-lane cross-section, but that will not alleviate the north-south traffic flows that are existing or forecasted through the Tryon/Holly Springs/Jones Franklin Road area. <b>CAMPO staff concurs that alternative proposals to address traffic and growth issues should still be considered as they are formulated, but recommends leaving the Cary-Gorman Street connection on the plan, as shown.</b>	
14.	Coordinate loop road systems around towns with adjacent facilities.
Staff received one comment about loop road systems around Fuquay-Varina being better integrated with adjacent “loop” systems. There is one study project on the roadway facility map that indicates where a connection should be considered, but no specific alignment was determined prior to approval of the TPU25 document. <b>Recommend that this connection be further studied as a part of the Western Wake Alternatives study in the “Travel Choices” section.</b>	
15.	There is insufficient funding now to construct an adequate transportation system.
Staff received one comment that suggested that there is insufficient funding for the proposed transportation system, and that further improvements would be required which are totally unfunded. <b>Additional funding options are being considered now, and the Transportation Plan Update 2025 project does recommend that additional revenue sources be sought and approved by the CAMPO boards within 18 months after its adoption.</b>	
16.	Comments supporting additional choice provisions and environmental mitigation efforts.
The Sierra Club submitted two pages of comments, partially supporting the existing draft LRTP and requesting modifications that support land use planning efforts, identifying total program costs, maximizing commuting efficiency in the movement of people and goods, exceeding federal air standards, incorporation of Best Management Practices to reduce impacts on water quality, be flexible towards our changing growth patterns in the Triangle Region, and preservation of the important places in the Triangle by increasing growth densities in areas that are less ecologically sensitive. <b>The initial response to these comments is that growth management by local governments is supported in the LRTP, and CAMPO is particularly ready to work with the outcome of the Wake County Growth Management Task Force that may recommend urban growth boundaries, travel alternatives, and other forms of land use/transportation integration. CAMPO also recognizes that the five corridor alternatives studies discussed in the LRTP need to be completed to provide an accurate picture of the funding, organizational, and operational requirements of a premium transit system in those areas.</b> The costs of the plan were developed in consideration of NCDOT, local, and linear cost estimates from CAMPO. Projected revenues were used as a target, recognizing that project priorities and funding forecasts may change over time. Reducing costs will be the result of the identification of those priorities changing at the local and MPO boards. A majority of the roadway projects are secondary system improvements (977 new lane-miles as compared to 63 lane-miles for freeway facilities). <b>CAMPO believes that some of the issues identified by the Sierra Club may be addressed during the development of the greenprint over the next 18 months. We welcome their participation in this and related exercises.</b>	

**PART II. CHRONOLOGY OF PUBLIC OUTREACH FOR *TPU25* PROJECT**

<b>Group/Individual</b>	<b>Date</b>	<b>Type</b>	<b>Comments</b>	<b>Action Items</b>	<b>Additional Information</b>
Swift Creek/Middle Creek Community Alliance (25)	July 25, 2001	Group presentation	Individuals commented on noise, urbanization, watershed/runoff, and facility location (S. Wake Expressway too close to “pick up traffic”) on various facilities. For widening of Tryon Road (6-7 lanes), against Cary-Garner Road, S. Wake Expressway, Gorman Street Extension. Also claims that new development that follows new road construction will promote more wells and runoff with the result that existing well water reserves will be depleted.	None.	File folder “Swift Creek Community” contains slide presentation, hand notes from meeting.
Raleigh Planning Department Staff Meeting (20)	September 15, 2001	Group Presentation	CAMPO Administrator provided information on survey results, current planning activities, plan performance areas, and land use scenarios.	None.	Done at the request of George Chapman.
Southern District Meeting  Participants: Anna Brigman, Watson Brown, Joe Huegy, Ed Johnson, Scott Lane, Larry Morgan, Carmalee Scarpitti, Mike Sorensen, and Kenneth Withrow.	September 19, 2001	Staff presentation & review	CAMPO staff addressed staff persons within the southern district of Wake County to review and determine possible transportation scenarios.  Major issues discussed involved examining scenarios that either include or not include the I-540 Bypass. Additional discussion included creating a regional rail loop from Apex to Fuquay-Varina to Garner. Groups participated in creating “grid” linkages within the southern district.	Revise maps to address possible transportation scenarios for southern Wake County.	File folder “Transportation Plan Update for 2025” contains handwritten notes.
Note: Held separate meeting with Bob Bass on September 22, 2000. Northern District Meeting	September 20, 2001	Staff presentation & review	CAMPO staff addressed transportation linkages within the northern district.  Major issues addressed included coordinating roadway widenings between Raleigh, Rolesville, and Wake Forest. Furthermore, the Town of Wake Forest desires to have regional rail extended to its central business district.	Revise maps to address possible transportation scenarios for northern Wake County.	File folder “Transportation Plan Update for 2025” contains handwritten notes.
Participants: Anna Brigman, Tim Clark, Don Dubay, Ed Johnson, Chip Russell, Chad Sary, Carmalee Scarpitti, Kenneth Withrow.					



Group/Individual	Date	Type	Comments	Action Items	Additional Information
Eastern District Meeting  Participants: Todd Allen, Anna Brigman, Melinda Clark, Michael Frangos, Ed Johnson, Earnest McDonald, Teresa Piner, Martin Stankus, Kenneth Withrow	September 27, 2001	Staff presentation & review	CAMPO staff addressed transportation linkages within the eastern district.  Major issues included: (1) regional rail extension to Five County Stadium, (2) the Northern Knightdale Bypass, and significant roadway connections within the eastern district.	Revise maps to address possible transportation scenarios for northern Wake County.	File folder "Transportation Plan Update for 2025" contains handwritten notes.
Western District Meeting  Participants: Tim Bailey, Derek Baker, Robert Bush, Tim Clark, Ed Johnson, Keith Megginson, Liz Rooks, David Rowland, Rodney Watkins, Kenneth Withrow	October 3, 2001	Staff presentation & review	Discussion focused on possible road widenings and connections in the areas of Cary and Morrisville.		
City of Raleigh Citizens Advisory Committee (15)  Participants: James W. Brantley, Ed Johnson, Gene Spooner, Martin Stankus, Lauren Swift, and Kenneth Withrow.	October 17, 2001	Staff presentation & review	Presentation to Raleigh CAC to request further presentations to individual CAC's. Staff promised to address (or address status) of localized issues provided that we receive list of questions prior to individual meetings.	Contact individual CAC's chairs (done via email)	Difficulty in reaching CAC heads or getting responses is eroding the effectiveness of this outlet.
Western District Meeting  Participants: Tim Bailey, Derek Baker, Anna Brigman, Ed Johnson, Larry Meisner, David Rowland, Mike Sorensen, and Kenneth Withrow.	October 18, 2000	Staff Meeting			

Group/Individual	Date	Type	Comments	Action Items	Additional Information
CAT Authority (15)	November 9, 2001	Staff Presentation	Staff presented the approved three strategies and preliminary modeling and Expert Peer Review Panel findings.	None	None
TAC Workshop (25)	December 11, 2001	Staff Presentation and Guest Lecturers	Staff presented preliminary findings, schedule concerns. Guest lecturers (3) provided information on rail, BRT, and I-40 CMS. Purpose was to increase level of understanding of new members and re-acquaint TAC members with project.	None	None
RTP Owners and Tenants Association (25)	December 14, 2001	Staff Presentation with other lecturers	Staff presented the approved three strategies and preliminary modeling and Expert Peer Review Panel findings. Staff also presented preliminary I-40 CMS findings as well as staff recommendations to boards.	None	None
C.O.R.E. Workshop (40)	January 8, 2002	Staff Presentation with other lecturers	Bill Summers presented the four options still under consideration, as well as the staff recommendations	None	None
Town of Morrisville (2 council members, management staff)	January 22, 2002	Staff Presentation	Ken Withrow discussed specific staff recommendations for the Morrisville area.	None	None
Wake County Planning Board (25)	February 6, 2002	Staff Presentation (part of agenda)	Staff presented recommendations to Wake County Planning Board and responded to questions/issues.	Provide copies of OAR v.4.1 (Tim Clark to make copies)	None
Raleigh Planning Staff Meeting (25)	February 15, 2002	Staff Presentation with one other lecturer	Scott Lane presented the TCC recommendations to the Raleigh planning staff.	Will follow up with Fox (Central Engineering) to determine CAMPO participation with installing Raleigh road projects on website	None
League of Mayors (15)	February 15, 2002	Staff Presentation with one other lecturer	Scott Lane presented TCC recommendations to mayors and municipal management from around Wake County.	None	None

Group/Individual	Date	Type	Comments	Action Items	Additional Information
TAC Workshop (15)	February 18, 2002	Staff with several other lecturers	Scott Lane presented TCC recommendations to TAC subset. Workshop was intended to familiarize the TAC with the issues prior to the February 20 TAC meeting and February 26 CAMPO/NCDOT TIP Coordination meeting.	None	None
Leadership Raleigh (20)	February 21, 2002	Staff with several other lecturers	Scott Lane verbally presented the TAC draft plan to several alumni of the Leadership Raleigh program. Other lecturers included Glen Lang and Janet Cowell (Cary and Raleigh City Council)	None	None
Public Workshops (100)	March 12, 13, 14; April 4, 8, 9, 2002	Staff presentation with individual question & answer sessions	CAMPO staff presented on the TPU25 at both the public officials' portion of the workshop (4pm - 5pm), as well as during the open house portion (5pm to 7:30pm). Questions were answered and additional discussion was held at the individual level.	Various (incl. additional information on specific projects)	None
Sierra Club Presentation TJCOG Office (20)	March 13, 2002	Staff presentation with individual questions; as well as participation in breakout groups for discussion	CAMPO staff presented the TPU25 to participants of the Sierra Club's Triangle Chapter. Following individual questions, members separated into breakout groups to discuss the TPU25 and make recommendations. The chair of the Sierra Club stated that the Triangle Chapter will review the recommendations the following week and present a formal recommendation to the CAMPO TAC prior to the public hearing on April 17.	Respond to questions as presented.	Participants have or will comment individually on the TPU25 and submit them to CAMPO.
Glenwood Citizens' Advisory Committee (16)	March 18, 2002	Staff presentation	CAMPO presented a summary of the LRTP and responded to questions from the audience.	None	Notices were sent to all the Raleigh CACs; only this one responded.
Triangle Transit Authority (5)	April 2, 2002	Staff presentation	CAMPO staff presented information to the planning subcommittee of the TTA. Additional discussion was held on specific transit recommendations contained in the <i>TPU25</i> .	None	

PART III. SPECIFIC COMMENTS RECEIVED ON THE TRANSPORTATION PLAN UPDATE 2025

During the course of its development, the *Transportation Plan Update 2025* project generated several comments in written or email form, which are reproduced on the following pages. Responses to these comments are shown in Part I of this report.

*[Note: These written comments are only available by contacting the staff of the Capital Area MPO. Ask for the written public comments on the Transportation Plan Update 2025 project, part three of the Public Involvement Report.]*

A110	Green Level West Road	White Oak Ch Rd	NC 55	2.5	N	2	4	NA	12500000	Cary	2015	L, P	No
A111	Reedy Creek Road	N.E. Maynard Rd	Harrison Avenue	1.1	N	2	3	NA	5600000	Cary	2015	L	No
A112	Smithfield Road	US 64 Bypass	Poole Road	1.5	N	2	5	NA	25702200	Knightdale	2015	F/S	No
A114	Ten Ten Road	Holly Springs Rd	Penny Road (Arbordale Ct.)	3.5	N	2	4	NA	15600000	Cary	2015	L	No
A117	New Hope Road extension	Poole Road	Jones Sausage Rd	1.9	N	2	4	NA	26561250	Raleigh	2015	F/S	No
A118	NC 55	NC 42	Harnett County	7.4	Y	2	4	NA	68752296	Wake County	2015	F/S	No
A119	McCrimmon Parkway	Aviation Pkwy	Airport Blvd	1.3	Y	2	4	NA	5536440	Cary	2015	F/S	No
A120	Tryon Road Extension	Old Garner Road	Rock Quarry Road	2.9	Y	0	4	U-3111	37025400	Raleigh	2015	F/S	No
A122	Holly Springs Road	Sunset Lake Rd.	Kildaire Farm Road	0.6	Y	2	6	NA	3481920	Cary	2015	F/S	No
A123	Old Garner Road	Tryon Road	Walnut Creek	2.1	Y	2	3	NA	6774084	Raleigh	2015	F/S	No
A124	Purnell Road/Forestville Loop	US 1	Burlington Mills Rd.	10.3	N	0	4	NA	73423927.2	Wake Forest	2015	F/S	No
A125	Forestville Road	Burlington Mills	Horton Rd.	6.5	N	2	4	NA	27511848	Wake Forest	2015	F/S	No
A126	Ligon Mill Road	NC 98	NC 401	4.6	N	2	4	NA	19505304	Wake Forest	2015	F/S	No
A127	Ligon Mill Road Connector	US 1	NC 98	3.3	N	2	4	NA	13926276	Wake Forest	2015	F/S	No
A128	Rogers Road (new location)	US 401 Bypass	Rogers Rd.	7.7	N	0	4	NA	55336046.4	Rolesville	2015	F/S	No
A130	Mitchell Mill Road (West)	US 401	Jonesville Road	3	N	0	0	NA	9000000	Ra\Wak\Rol	2015	F/S	No
A133	Burlington Mills Road	US 1	US 401	4.5	N	2	4	NA	19698012	Wake Forest	2015	F/S	No
A134	West Young Street (improvements)	N. Main Street	Jones Dairy Road	1.7	N	2	3	NA	5443610.4	Rolesville	2015	F/S	No
A138	Timber Drive & Extension	NC 50 South	Jones Sausage Rd	8.7	N	0	4	NA	66807432	Garner	2015	F/S	No
A139	Yeargan Road & Extension	Garner Rd.	Jones Sausage Rd	2.1	N	0	2	NA	6150000	Garner	2015	F/S	No
A14	Ray Road	Leesville Road	Strickland Road	2.7	N	2	3	NA	7762000	Raleigh	2015	L	No
A140	Vandora Springs Road & Ext.	Lake Wheeler Road	Timber Drive and Timber Drive Extension	3.3	N	0	4	NA	27120381.6	Garner	2015	F/S	No
A141	Ten Ten Road	Bells Lake Rd.	West Lake Road	0.8	N	2	4	NA	3236688	Cary	2015	F/S	No
A142	Greenfield Parkway	Timber Drive	US 70 East	2.7	N	0	4	NA	20240791.2	Garner	2015	F/S	No
A144	NC 50	Timber Drive	NC 42	8.3	N	2	5	NA	40293276	Garner	2015	F/S	No
A146	NC 96 Bypass	NC 96	NC 97	9.3	N	0	4	NA	66560541.6	Zebulon	2015	F/S	No
A148	Eagle Rock Road	US 64 Bypass	Bissette Rd. (Johnston Co.)	5.4	N	2	3	NA	16514640	Wendell	2015	F/S	No
A15	Blue Ridge Road	Duraleigh Road	Glenn Eden Drive	1	N	2	4	NA	4835000	Raleigh	2015	L	No
A150	NC 98	NC 98 Bypass	Durham County	8.9	N	2	3	NA	21859408.8	Raleigh	2015	F/S	No
A151	Aviation Parkway	I-540	Airport Blvd	4.8	Y	2	4	NA	25979184	Raleigh\Durham	2015	F/S	No
A152	Eastern Durham Parkway	US 70	Leesville Rd.	1	Y	0	4	NA	7149360	Raleigh\Durham	2015	F/S	Y
A153	Norwood Road	New Leesville Road	Creedmoor Road	3.2	N	2	4	NA	13628160	Raleigh	2015	F/S	No
A155	T.W. Alexander Drive	US 70	New Leesville Road	2.5	N	0	4	NA	17873400	Raleigh	2015	F/S	No
A16	Rock Quarry Road	Southgate Drive	Holloway Road	2	N	2	5	NA	11495000	Raleigh	2015	L	No
A160	Skycrest Drive	New Hope Rd	Southall Road	1	Y	0	2	NA	3065000	Raleigh	2015	L	Y
A161	Skycrest Drive	Southall Road	I-540	2.7	N	0	4	NA	19411000	Raleigh	2015	L	No
A162	Buffalo Road	Southall Road	I-540	2.4	N	2	5	NA	10306296	Raleigh	2015	F/S	Y
A163	Holly Springs Road	Sunset Lake Rd	New Hill Holleman	5.1	N	2	4	NA	22466232	Holly Springs	2015	F/S	No
A165	Airport Boulevard Extension	NC 54	Morrisvle Carpentr	1.9	N	0	4	NA	13297809.6	Cary	2015	F/S	No
A166	Ten Ten Road/Apex Peakway	Ten Ten Road	Apex Peakway	2.8	N	0	4	NA	19803727.2	Apex	2015	F/S	Y
A167	Wendell Northern Bypass	US 64 Bus(east)	US 64 Bus (west)	2.5	N	0	2	NA	7470000	Wendell	2015	F/S	No
A174	Morrisville Parkway Extension	Green Level Ch	NC 751 (Chatham Co.)	1.5	N	0	4	NA	10724000	Cary	2015	F/S	Y
A178	Olive Chapel Road	NC751	NC 55 Widening (Including HollySprings Bypass)	4.9	N	2	4	NA	26032860	Apex	2015	F/S	Y
A179	Richardson Road	US 64 (West)	Holly Springs Road	5.4	N	2	4	NA	22869756	Apex	2015	F/S	No
A18	Newton Road	Falls of Neuse	Six Forks	1.5	Y	2	3	NA	2200000	Raleigh	2015	L	No
A180	Jenks Road	Kelly Road	New Western Thor.	3.3	N	2	4	NA	13841100	Cary	2015	F/S	Y
A184	Apex Barbecue Road	US 1 Business	Jenks Road	3	N	0	2	NA	9120000	Apex	2015	F/S	No
A186	Friendship Road	New East-West	Woods Creek Road	2.4	N	0	2	NA	7170000	Apex	2015	F/S	Y
A187	Apex Peakway	NC 55	NC 55	6.2	N	0	4	NA	44254538.4	Apex	2015	F/S	No
A188	Humie Olive Road	Old US 1	NC 751	2.2	N	2	4	NA	9497124	Apex	2015	F/S	Y
A19	I-440\Six Forks	Six Forks Road	I-440	0.3	N	2	4	NA	1445000	Raleigh	2015	F/S	No
A192	Bells Lake Road	Ten Ten Road	E-W Pkwy (North)	2.1	N	2	4	NA	8943480	Cary	2015	F/S	No
A193	Sunset Lake Road	US 401 (South)	Southern Road	8	N	2	4	NA	43101828	Holly Springs	2015	F/S	No
A194	Litchford Road	Old Wake Forest	Falls of Neuse	3	N	2	3	NA	6885000	Raleigh	2015	F/S	Y
A196	Lynn Road Extension	US 70	Duraleigh Road	2.2	N	0	4	NA	27736992	Raleigh	2015	F/S	Y
A197	Centennial Campus Connector & Interchange	Centennial Pkwy	I-40/I-440	1	N	0	4	NA	27876381.6	Raleigh	2015	F/S	No
A198	Tryon Road Extension	Old Garner Rd	Wilmington Street	1.7	N	0	5	U-3111	10268952	Raleigh	2015	F/S	Y
A199	Pullen Road-Centennial Connector	Pullen Road	Centennial Pkwy	0.4	N	0	4	NA	3835488	Raleigh	2015	F/S	No
A2	Southall Road	Buffaloe Road	New Bern Ave	3.31	Y	0	5	NA	14330000	Raleigh	2015	L	No
A20	Hillsborough Street Safety & Enhancement Project	Gorman Street	Oberlin Road	1.4	N	4	2	NA	15900000	Raleigh	2015	F/S; L	Exempt
A205	Six Forks Extension	Atlantic Avenue	Capital Blvd	0.6	N	0	5	NA	5567827.2	Raleigh	2015	F/S	No
A208	Cary Pkwy/Gorman Connection	Cary Pkwy Ext	Gorman Street	1.9	N	0	4	NA	14735784	Raleigh	2015	F/S	No
A209	New Leesville Road	Westgate Road	US 70 (Durham County)	1.6	Y	2	4	NA	6814080	Raleigh	2015	F/S	Y
A21	Lake Boone Trail Extension	Blue Ridge Road	Edwards Mill Ext.	0.4	Y	0	5	NA	2801025.6	Raleigh	2015	F/S	No
A210	Leadmine Road	North Hills Drive	Millbrook Road	1.2	Y	2	3	NA	2754000	Raleigh	2015	F/S	No
A211	Old Buffalo Road	Near US 1	New Hope Road	0.5	Y	2	5	NA	2279400	Raleigh	2015	F/S	Y
A212	Buffalo Road	New Hope Rd	Southall Road	1	Y	2	5	NA	4558800	Raleigh	2015	L	No
A213	Duraleigh Road	Ebenezer Ch Rd	US 70	2.7	Y	2	5	NA	12308760	Raleigh	2015	F/S	Y
A218	Jessie Drive	US 1 South	Penny Road	2.9	Y	2	4	NA	30926520	Cary	2015	F/S	No
A221	NC 54	N.W. Maynard Rd	South of Cary Parkway	0.9	Y	2	4	NA	3832920	Cary	2015	F/S	Y
A225	East West Road	US 401 (South)	Sunset Lake Road	2.2	N	0	2	NA	6660000	Fuquay-Varina	2015	F/S	Y
A226	Optimist Farm Road	Bells Lake Rd.	Lake Wheeler Road	2.1	N	2	4	NA	27519480	Cary	2015	F/S	No
A228	NC 50	Timber Drive	US 70	1.2	N	2	3	NA	2754000	Garner	2015	F/S	Y
A230	O'Kelley Chapel Road	NC 55	NC 751	3.6	N	0	4	NA	25737696	Cary	2015	F/S	No
A231	Trinity Road	Edwards Mill Road Extension	Cary Parkway	1.1	N	2	4	NA	12246696	Cary	2015	L	Y
A232	S.W. Maynard Road	W. Chatham Street	Kildaire Farm Road	1.2	N	2	4	NA	12561696	Cary	2015	L	No
A236	Old Apex Road	High House Rd	Cary Parkway	2.1	N	2	4	NA	15396696	Cary	2015	L	No
A237	NC 54	NE Maynard Road	NW Maynard Road	2	N	2	4	NA	15081696	Cary	2015	L	Y

A26	McCrimmon Parkway	Airport Blvd	NC 54	0.4	Y	2	4	U-3620	2950000	Cary	2015	F/S	No
A27	Louis Stephens Drive Ext	Morrisville Pkwy	Cary ETJ	1.4	Y	0	4	NA	11150000	Cary	2015	F/S	No
A29	High House Road	Davis Drive	NC 55	1.2	Y	2	4	NA	5145000	Cary	2015	L	No
A3	Spring Forest Road Extension	US 401	Buffalo	1.48	N	0	5	NA	10681000	Raleigh	2015	L	No
A30	Morrisville Parkway	Davis Drive	NC 55	1.2	Y	0	4	NA	6000000	Cary	2015	L; P	No
A35	Evans Road	NW Maynard Rd	Cary Parkway	1.3	Y	2	4	NA	3355000	Cary	2015	L	No
A36	West Chatham Street	Old Apex Road	Old Apex Road	1.5	Y	2	4	NA	7700000	Cary	2015	L	No
A37	Walnut Street	US 1 (South)	Tryon Road	1.1	Y	2	6	NA	33000000	Cary	2015	L	No
A40	Kildaire Farm Road	Swift Creek	Penny Road	0.6	Y	2	4	NA	6340000	Cary	2015	L	No
A41	Kildaire Farm Road	Penny Road	Arthur Pierce Road	2	Y	2	4	NA	7600000	Cary	2015	L	No
A42	Penny Road	Ten Ten Road	Holly Springs Rd.	3.1	Y	2	4	NA	15500000	Cary	2015	L	No
A44	Tryon Road	Dillard Drive	Walnut	0.9	Y	2	5	NA	4000000	Cary	2015	L	No
A46	Tryon Road	Lake Wheeler Rd	S. Wilmington Street	2.1	Y	2	3	NA	3400000	Raleigh	2015	L	No
A47	Sunnybrook Road	Poole Road	New Bern Avenue	0.6	Y	2	5	NA	2200000	Raleigh	2015	L	No
A49	Poole Road	Maybrook Dr.	Barwell Road	1.1	Y	2	5	NA	8724600	Raleigh	2015	L	No
A50	Harrison Avenue	Maynard Road	I-40	2.6	N	2	5	U-2804	0	Cary	2015	F/S	No
A51	Smithfield Road	Forestville Road	Carrington Drive	1	N	2	4	U-3441	4792200	Knightsdale	2015	F/S	No
A52	Smithfield Road	Carrington Drive	US 64 Bypass	2.7	Y	2	5	TP - 5	31172760	Knightsdale	2015	F/S	No
A57	Sandy Forks Road	Falls of Neuse	Six Forks Road	1.3	N	2	3	NA	3423000	Raleigh	2015	L	No
A59	N.E. Regional Center	Capital Blvd	Old Wake Forest Road	2.5	Y	0	4	NA	1989000	Raleigh	2015	L	No
A63	Cary Parkway Extension	Harrison Avenue	Trinity Road	1.2	Y	0	2	NA	10300000	Cary	2015	L; P	No
A64	Aviation Parkway	NC 54	I-40	2.6	N	2	4	U-3343	4900000	Cary	2015	L	Y
A65	Trinity Road	Trenton Road	NC 54	0.9	N	2	4	NA	3600000	Cary	2015	L	No
A66	O'Kelley Chapel Road	NC 55	Research Triangle Park	1.8	N	0	2	NA	4000000	Cary	2015	L	No
A69	Holly Springs Road	Cary Parkway	Penny Road	2.2	N	2	6	NA	9700000	Cary	2015	L	No
A70	Holly Springs Road	Penny Road	Ten Ten Road	1.1	N	2	6	NA	6700000	Cary	2015	L; P	No
A71	Holly Springs Road	Ten Ten Road	Kildaire Farm Road	1.9	N	2	6	NA	11100000	Cary	2015	L; P	No
A72	Jenks Carpenter Road	High House Rd	High Road	1.5	N	2	3	NA	5700000	Cary	2015	L	No
A73	Jones Franklin Road	I-40	Walnut	0.8	N	2	4	NA	15200000	Cary	2015	L	No
A75	New Western Thoroughfare (Cary)	Page/Hopson Road	US 64 (West)	9.1	N	2	4	NA	30000000	Cary	2015	L; P	No
A76	Optimist Farm Road	US 401 (South)	Sunset Lake Road	1.7	N	2	4	NA	6000000	Cary	2015	L; P	No
A77	West Lake Road	Ten Ten Road	Optimist Farm Road	1.5	N	2	4	NA	5000000	Cary	2015	L; P	No
A78	Pierce Olive Road	Optimist Farm Road	Holly Springs Road	1.8	N	2	4	NA	6000000	Cary	2015	L; P	No
A79	Glenwood Ave\Crabtree Ave Conn	Glenwood Ave	Crabtree Avenue	1.6	N	0	3	NA	15000000	Raleigh	2015	L	No
A80	New Hope Road	US 64	Poole Road	2	N	2	4	NA	13478000	Raleigh	2015	L	No
A81	Western Boulevard Extension	Western Blvd	I-40	1.5	N	0	4	NA	15966000	Raleigh	2015	L	No
A82	Trinity Road Extension	NC 54	Cary Towne Blvd.	1.1	Y	2	4	NA	16000000	Cary	2015	L	No
A83	Durant Road	US 1 (North)	Falls of Neuse	1.1	N	2	5	NA	6947000	Raleigh	2015	L	No
A84	Holt Road	Old Jenks Road	Old Jenks Road	1.9	Y	2	3	NA	1900000	Raleigh	2015	L; P	No
A86	Leesville Road	Lynn Road	Westgate Road	2.8	Y	2	5	NA	14230000	Raleigh	2015	L	No
A88	New Rand Road	Timber Drive	US 70	1.1	Y	2	3	NA	3633300	Garner	2015	F/S	No
A90	US 401 Widening	Ligon Mill Road	NC 39 (Louisburg)	18.5	Y	2	4	R-2814	20000000	NCDOT	2015	F/S	No
A91	Jones Sausage Road	Rock Quarry Rd	I-40	1.4	N	2	5	NA	6200000	Raleigh	2015	L	No
A93	NC 55	US 64	SR 1121 (Durham Co.)	13	Y	2	4	R-2906	37500000	Apex\Cary\Holl Sprg	2015	F/S	No
A94	NC 55	US 421	US 401	20	Y	2	4	R-2540	5000000	NCDOT	2015	F/S	No
A96	NC 55	US 1	US 64	3.2	Y	2	5	U-2901	22867200	Apex\Cary\Holl Sprg	2015	F/S	No
A97	Airport Blvd	I-40	NC 54	1.9	Y	2	5	U-3344	2300000	Cary	2015	F/S	No
A99	Arthur Pierce Road	Kildaire Farm	Holly Springs Road	1.5	N	2	3	NA	6000000	Cary	2015	L; P	No
A113	Ten Ten Road	Holly Springs Rd	West Lake Road	1.1	N	2	4	NA	6119064	Wake County	2025	F/S	No
A131	NC 96	Zebulon	NC 98	11.3	N	2	3	NA	26042058	Ral\Wak\Rol\Zeb	2025	F/S	No
A132	Peebles Road Extension	West Young Street	US 401	2.6	N	0	2	NA	9528000	Ral\Wak\Rol	2025	F/S	No
A136	Lake Wheeler Road	Tryon Road	US 401 South	5.3	N	2	4	NA	25366464	Raleigh\Garner	2025	F/S	No
A137	Old Stage Road	US 401 South	Harnett County	13.3	N	2	4	NA	58860864	Garner	2025	F/S	No
A143	White Oak Road	US 70	NC 42 (Johnston Co.)	7.2	N	2	4	NA	30620772	Garner	2025	F/S	No
A149	Poole Road	Barwell Rd.	Third St. (Wendell)	10.3	N	2	3	NA	24834456	Raleigh\Kni\Wendell	2025	F/S	No
A154	Triangle Pkwy-NC54 Connector	Triangle Pkwy	NC 54	1.3	N	0	4	NA	9580142.4	Ral\Car\Morrisville	2025	F/S	Y
A156	Carpenter Pond Road	NC 98	T. W. Alexander Drive	6.7	N	2	4	NA	28619136	Raleigh	2025	F/S	Y
A157	Eastern Parkway	US 401 (South)	US 401 (South)	5.8	N	0	4	NA	53354136	Fuquay-Varina	2025	F/S	No
A158	Hilltop-Needmore Road	NC 55 (South)	US 401 (South)	7.3	N	0	4	NA	81421768.8	Fuquay-Varina	2025	F/S	Y
A159	Western Parkway (Fuquay Varina)	NC 55 South	US 401 (South)	5.3	N	0	4	NA	62340216	Apex\Fuq-Var\Holly	2025	F/S	No
A168	Green Level Church Road	Jenks Rd.	Page-Hopson (Durham Co.)	6.4	N	2	4	NA	27171144	Cary	2025	F/S	Y
A169	NC 231 (Southern Wendell) Bypass (partial control)	NC 231	US 64 Bypass	5.8	N	0	2	NA	17280000	Wendell	2025	F/S	No
A172	Kelly Road	Jenks Rd.	Old US 1	5.2	N	2	4	NA	26881524	Apex\Cary	2025	F/S	Y
A173	NC 751/New Hill Rd.	US 1 (South)	Chatham Co.	5.3	N	2	4	NA	22571640	Apex	2025	F/S	Y
A176	Dillard Drive	Dillard Dr at I-40, e. of Jones Franklin		0.4	N	2	4	NA	2858400	Cary	2025	F/S	No
A181	Old US 1	NC 751	Apex Peakway	4.8	N	2	5	NA	34443720	Apex	2025	F/S	No
A182	Friendship Road Connector	Friendship Rd	US 1/1010 Connector	2.7	N	0	2	NA	8190000	Apex	2025	F/S	Y
A185	New East-West Connector	Kelly Road	NC 751	3.3	N	0	2	NA	9840000	Apex	2025	F/S	No
A189	Sherron Harris Road	55/401 Conn	Terminus	2.9	N	2	3	NA	6655500	Holly Springs	2025	F/S	No
A190	New Hill Holleman Road	US 1	Sherron Harris Road	3.7	N	2	3	NA	9240750	Holly Springs	2025	F/S	Y
A195	Creedmoor Road	Glenwood Ave	Strickland Road	3.9	N	4	6	NA	16524144	Raleigh	2025	F/S	No
A200	Tryon-Sausage Connector	Tryon Road	Jones Sausage Rd	1.1	N	0	4	NA	10451704.8	Raleigh	2025	F/S	Y
A201	Rock Quarry Road	I-40	Auburn-Knightdale	6.6	N	2	4	NA	35157780	Raleigh	2025	F/S	No
A202	Rock Quarry Road	Auburn-Knightd	US 70	3.3	N	2	4	NA	13926276	Raleigh	2025	F/S	Y
A203	Auburn-Knightdale Road	Bethlehem Rd	White-Oak Road	7.3	N	2	4	NA	31259592	Gar\Knight\Ral	2025	F/S	No
A204	Bethlehem Road	Smithfield Road	Auburn-Knightdale	3	N	2	4	NA	12563460	Raleigh	2025	F/S	Y
A207	Judd Parkway	US 401 South	US 401 (South)	1.9	Y	0	2	R-2826	5700000	Fuquay-Varina	2025	F/S	Y

A214	Garner Road	Tryon Road	East of Auburn/Knightdale	9.5	N	2	3	NA	21802500	Garner	2025	F/S	No
A215	Jones Dairy Road	NC 98	Averette Road	2.8	N	2	4	NA	11924640	Rolesville	2025	F/S	Y
A216	Jones Dairy Road Extension	Averette Road	NC 96	3.4	N	2	4	NA	14650272	Rolesville	2025	F/S	No
A217	Sunset Lake Road Connector	NC 55	Southern Road	1.5	N	2	4	NA	24964200	Holly Springs	2025	F/S	Y
A219	McCrimmon Parkway Extension	NC 54	New Western Thoroughfare	5.8	N	0	4	NA	60546794.4	Cary\Morrisville	2025	F/S	Y
A220	Morrisville Carpenter Road	NC 54	New Western Thoroughfare	6.4	N	2	4	NA	45747144	Cary	2025	F/S	No
A222	NC 54	Cary Parkway	Page-Hopson (Durham Co.)	5.3	N	2	4	NA	22614228	Cary	2025	F/S	No
A223	Kit Creek Road	NC 54	NC 55	2.8	N	2	4	NA	11711700	RTP	2025	F/S	Y
A224	Bells Lake Road (South)	Hilltop-Needmore Road	US 401 (South)	2.5	N	2	3	NA	5622750	Fuquay-Varina	2025	F/S	No
A234	Western Boulevard	Gorman Street	Avent Ferry Road	0.7	N	4	6	NA	11049696	Raleigh	2025	F/S	No
A235	U.S. 1A	U.S. 1	NC 98 Bypass	1.7	N	2	5	NA	14646696	Wake Forest	2025	F/S	Y
			Total Arterial Costs	707.3					3013052070				