

## **Appendix A: Charge to the Special Transit Advisory Commission**

### **Joint MPO STAC**

#### ***Charge to the Commission***

The Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) and the N.C. Capital Area Metropolitan Planning Organization (CAMPO) have concluded that providing well-planned and timely major regional transit investments is a very important part of maintaining the Triangle region's current levels of transportation mobility, high quality of life and economic prosperity. Therefore, the MPOs have agreed to pursue the joint development of a Regional Transit Vision Plan for a regional transit system to serve as the foundation for making comprehensive, cooperative, and well-coordinated decisions on future major transit investments. The development of this plan should include a robust public outreach/community engagement effort and a process for establishing priorities for regional transit investments.

The two MPOs have also agreed to appoint a Joint MPO Special Transit Advisory Commission to assist them in the development of the Regional Transit Vision Plan (RTVP). This commission will deliver to the region's two MPOs a set of recommended major transit investments to serve the Triangle based on:

- Guiding principles for transit investments
- The *Transit Infrastructure Blueprint Project* analysis
- Priorities for transit investments
- A community engagement process

#### ***Tasks***

To accomplish its overall mission, the commission may engage in any and all of the following focus areas. MPO and other staff will provide technical assistance to the commission for these tasks.

1. Review existing transit plans and relevant sections of the 2030 Long Range Transportation Plans, including the goals and objectives stated in those plans.
2. Determine the level and process for public outreach needed to inform and support the commission's recommendations.
3. Determine goals and objectives for regional major transit investments.
4. Review and evaluate transit options available to the region for the next 25 to 30 years.
5. Determine regional major transit investment recommendations
6. Other areas as deemed advisable by the commission.

#### ***General Schedule of Activities (draft)***

February-March – MPOs name representatives to the Commission, approve the description of the Commission, and review and endorse a proposal for support services.

April – Commission begins meeting (1-2 times per month).

- Commission confirms budget, staffing, and funding for facilitation, administration, and outreach.
- Members concur on the charge of the commission and overall schedule of work.
- Commission determines missing information and identifies focus areas needed to execute charge.

Spring – Technical activities and development of analysis framework.

- Commission develops framework of prioritized goals and objectives for making recommendations, including identification of problems needing to be addressed by transit.
- MPOs, TTA, NCDOT transit staff collect data on travel markets, land use, impacts on the environment, impacts on neighborhoods and communities, costs of potential transit technologies, best practices in other areas, and other needs identified by the commission.

Summer – Commission reviews Transit Infrastructure Blueprint data and related research and evaluates alternatives.

Fall – Commission develops recommendations for a Regional Transit Vision Plan.

October 31, 2007 – Commission presents its recommendations to the two MPOs at the Joint MPO TAC meeting. The MPOs will then use the recommendations in the development of their 2035 Long Range Transportation Plans.

## **Appendix B: STAC Membership; Staff/Sponsor Working Group List**

### **Special Transit Advisory Commission Members**

#### **Bill Cavanaugh (Co-Chair) (Capital Area MPO)**

Former Chairman, CEO, and President, Progress Energy, Inc.  
Chairman, World Association of Nuclear Operators (WANO)  
Member, National Academy of Engineering

#### **George Cianciolo, Ph.D. (Co-Chair) (DCHC MPO)**

Chair, Chapel Hill Planning Board  
Member, Chapel Hill Community Design Commission  
Former Chair and Member, Chapel Hill Transportation Board (6 years)  
Former Member, University of North Carolina Leadership Advisory Committee  
Associate Professor of Pathology, Duke University Medical Center

#### **Robert ("Bo") Glenn (Co-Vice-Chair) (DCHC MPO)**

Attorney, Glenn, Mills and Fisher, P.A.  
Vice Chair, Durham Open Space and Trails Commission  
Commissioner, Durham Bicycle and Pedestrian Commission  
Board Member, Durham Farm Land Preservation Board  
Former Vice Chair, Durham Housing Authority (20 years)

#### **Smedes York (Co-Vice-Chair) (Capital Area MPO)**

President, York Properties, Inc.  
Mayor, City of Raleigh, 1979-1983  
Raleigh City Councilman, District E, 1977 to 1979.  
Board Chairman, York Simpson Underwood and McDonald-York  
Past Chairman, North Carolina Citizens for Business and Industry  
Past Chairman, N.C. State University Board of Trustees  
Board of Directors, Research Triangle Foundation  
YMCA of the Triangle  
North Carolina Amateur Sports  
Trustee, Urban Land Institute  
Founding Co-Chair, Regional Transportation Alliance

#### **Cassandra Atkinson, Ph.D. (DCHC MPO)**

Adjunct Associate Professor, Department of Public Administration  
Director, Community Research and Technical Assistance Initiative  
Project Director, Transportation Management Bachelor's Degree Program,  
North Carolina Central University  
Experience with transportation management needs research and NCDOT grants.

#### **Tom Bradshaw (Capital Area MPO)**

Mayor, City of Raleigh 1971-1973  
Secretary, N.C. Dept. of Transportation, 1976 - 1979  
Member, Blue Ribbon Committee on the Future of Wake County  
Managing Director, Public Finance Dept., CitiGroup Global Markets, Inc.

**Gerry Cohen (Capital Area MPO)**

Director, Legislative Drafting, N.C. General Assembly  
Former Member, Chapel Hill Town Council  
Former Member, Chapel Hill Transportation Board

**Daniel Coleman (Capital Area MPO)**

Contractor  
Livable Streets Partnership  
Raleigh-Wake Citizens Association

**Trish Dowty (Capital Area MPO)**

Vice President, Corporate Services Division, SAS  
Property, Procurement, and Logistics Management,  
CTI Data and Denelcor, Inc.  
Board of Directors, Cary Chamber of Commerce

**Carolyn Eifland (DCHC MPO)**

Associate Vice Chancellor for Campus Services  
University of North Carolina at Chapel Hill  
The University's transportation planning, transportation demand management, and transit functions are within her area of responsibility.  
Member of the partnership committee that guides the Chapel Hill Transit System  
Represented the University on the US 15-501 and I-40 / 54 corridor studies

**Greg Flynn (Capital Area MPO)**

Architect N.C. Dept of Public Instruction School Planning  
WakeUP Wake County  
Formerly, N.C. Division of Forest Resources

**Chris Harder (DCHC MPO)**

Vice Chair, Durham Area Transit Authority (DATA) Board  
Senior Budget Analyst, Office of the Governor, State Budget and Management  
Former Congressional Fellow for Rep. Earl Blumenauer (Portland, Oregon)  
Master's in Regional Planning and Public Administration

**Mike Hendren (Capital Area MPO)**

Wake Forest Chamber of Commerce.  
Board of Directors, Chair of the Government Affairs Committee

**Cal Horton (DCHC MPO)**

Former Town Manager (16 years, until 2006), Town of Chapel Hill.  
As manager, he has been a regional leader on transportation issues.

**Jodi LaFreniere (Capital Area MPO)**

Executive Director of the Wake Forest Chamber of Commerce  
Member, Business Alliance Leadership Team  
Member, Regional Transportation Alliance

**Jennifer Lewis (Capital Area MPO)**

Sierra Club, Capital Group  
Member, Capital Area MPO Bicycle and Pedestrian Stakeholder Group  
Transportation Planner, The Louis Berger Group

**Rusine Mitchell-Sinclair (Capital Area MPO)**

CEO, Girl Scouts, North Carolina Coastal Pines  
Vice President at Large, North Carolina Electronics and Information Technologies Association (NCEITA)  
Vice Chair of Regional Leadership, Regional Transportation Alliance  
Senior State Executive, VP Strategy & Implementation, Global IT Delivery, IBM (retired)

**Sam Nichols Jr. (DCHC MPO)**

Senior Vice President, First Citizens Bank  
Durham Chamber of Commerce, Transportation and Economic Development Committees

**Sandy Ogburn (DCHC MPO)**

Member of the board of directors of several organizations in the Durham community, including the Durham Community Land Trust and the West End Community Center  
Former Member of the Durham City Council, the Durham-Chapel Hill-Carrboro MPO, and the Triangle Transit Authority Board of Trustees

**Mack Paul (Capital Area MPO)**

Attorney, Kennedy Covington  
Past President, Triangle Tomorrow  
Former Associate General Counsel, Blue Cross and Blue Shield of NC

**Bernadette Pelissier, Ph.D. (DCHC MPO)**

Chair, Orange Chatham Group of the Sierra Club  
Member, Orange County Planning Board  
Member, Orange County Commission for the Environment  
Former Member, University of North Carolina Leadership Advisory Committee  
Ph.D. in Sociology  
Recently retired from the Federal government

**Roger Perry (DCHC MPO)**

Chair, Triangle Tomorrow  
President, East West Partners  
Member of the Chapel Hill-Carrboro Chamber of Commerce and the Regional Transportation Alliance  
Member, Board of Trustees, University of North Carolina at Chapel Hill  
Served on the Board of Visitors of UNC and Executive Committee of the Center for Real Estate at UNC's Kenan Flagler School  
Past Chair, Triangle United Way

**Frank Price (Capital Area MPO)**

President, F. L. Price & Associates  
Chair, Clayton Planning Board

**Tim Reed (Capital Area MPO)**

Conservation Co-Chair, Capital Group Sierra Club  
Designer, BBH Design, PA

**Holly Reid (DCHC MPO)**

President, Board of Trustees, Eno River Association  
Co-Founder, Walkable Hillsborough Coalition  
Former Member, Orange County's Economic Development District Transportation Task Force

**Warren Sawicki (Capital Area MPO)**

Fuquay-Varina Chamber of Commerce  
Retired manufacturing executive

**Mike Shiflett (DCHC MPO)**

Member, Durham Inter-Neighborhood Council, Northgate Park  
Member, Board of Directors, Coordinating Council for Senior Citizens  
President and CEO, American Labor  
Member the Regional Transportation Alliance and the Durham Chamber of Commerce, Transportation Committee  
Served on US 40 HOV Task Force, Durham Comprehensive Plan, Travel Demand Ordinance Task Force

**Frank Timberlake (Capital Area MPO)**

R.F. Timberlake and Company  
President Carolinas/Virginia Chapter NAMA (National Agri-Marketing Association)

**Ed Willingham (Capital Area MPO)**

2006-07 Chair, Regional Transportation Alliance  
Executive Vice President, First Citizens Bank, Triangle Region

**Ex-Officio Members**

**Joe Bryan (Capital Area MPO)**

Chair, Capital Area MPO TAC  
Commissioner, Wake County

**John Brantley (Capital Area MPO)**

Director, RDU International Airport  
Member, Blue Ribbon Committee on the Future of Wake County

**James Carnahan (DCHC MPO)**

Founder of the Village Project  
Town of Carrboro Planning Board  
UNC, Carolina North, Leadership Advisory Committee

**Alice Gordon (DCHC MPO)**

Chair, DCHC MPO TAC  
Commissioner, Orange County

**Becky Heron/ Mike Woodard (DCHC MPO)**

Vice Chair, DCHC MPO TAC  
Commissioner, Durham County (Heron)  
Council Member, City of Durham (Woodard)

**Mack McKrell (Capital Area MPO)**

Long-time regional transit user  
Cary resident working in Durham (IBM / RTP)

**Charles Meeker (Capital Area MPO)**

Vice Chair, Capital Area MPO TAC  
Mayor, City of Raleigh

**Dianne Reid (DCHC MPO)**

Chatham County Economic Development Corporation

**Rick Weddle (Capital Area MPO)**

President and CEO, Research Triangle Foundation  
Vice Chair for Governmental Affairs, Regional Transportation Alliance  
Commission Member, Blue Ribbon Committee on the Future of Wake County

**Staff and Sponsors Working Group and Support Staff**

**Mark Ahrendsen, DCHC MPO**

**September Barnes, TJCOG**

**Ben Bearden, TJCOG**

**Ellen Beckmann, DCHC MPO**

**Paul Black, TJCOG**

**David Bonk, DCHC MPO/Town of Chapel Hill**

**Phillip Boyle, PhD, Leading and Governing Associates**

**Bob Foyle, ITRE**

**Damien Graham, Triangle Transit**

**Wib Gulley, Triangle Transit**

**Ann Hartell, ITRE**

**John Hodges-Copple, TJCOG**

**Ed Johnson, Capital Area MPO**

**David King, Triangle Transit**

**Michael Kozak, NCDOT**

**Patrick McDonough, Triangle Transit**

**Joe Milazzo II, RTA**

**Greg Northcutt, Triangle Transit**

**Miriam Perry, NCDOT**

**Brad Schulz, Triangle Transit**

**Juanita Shearer-Swink, Triangle Transit**

**Diane Wilson, Capital Area MPO**

# Project Overview

## Regional Transit Infrastructure Blueprint *Technical analysis of land use, travel markets and costs*

FEBRUARY 2007

### Purpose

Provide the technical basis for a Regional Transit Blueprint that describes future transit corridors and planned or potential transit infrastructure investments in the corridors.

### Desired Result

Citizens and decision-makers understand the character of current and projected development and travel in potential transit corridors, how the corridors relate to one another, and important considerations for different types of transit investments in the corridors.

The focus of the project is to provide clear, consistent information for decision-makers to engage the public and set priorities through the established Metropolitan Planning Organizations.

### Why this is Important

1. There has been no comprehensive, consistent regionwide blueprint for major transit investments since the development of TTA's 1995 Transit Plan. Major transit investment planning since then has focused on individual projects and grouping selected projects into a transit component when Long Range Transportation Plans (LRTPs) are updated.
2. This project-specific approach has resulted in cost and revenue assumptions for major transit investments in our long range plans that may no longer be realistic, since they rely on new federal funding to pay 50% and NCDOT to pay 25%, a new regional revenue source and out-dated costs for some projects.



*Bus Rapid Transit is one example of potential regional transit infrastructure*

3. To secure federal funds, state funds and new regional revenue sources to support major transit investments will require a high level of cooperation among MPOs, the NCDOT, the TTA and other partners. Absent such cooperation, individual MPOs and communities may need to fund major transit investments from their existing individual revenue streams.

### Goals

The goals are designed to help decision-makers and the public understand transit corridors and investments and set realistic priorities:

1. show the location of transit corridors and type of potential transit investments, including assumed alignment, technology, stations and services;
2. clearly articulate the mobility and community purposes served by transit investments in each corridor (purpose and need of transit investments);
3. track the status of transit investments in the planning and funding process;



*Regional Rail is one example of potential regional transit infrastructure*

### PROJECT SPONSORS

Capital Area MPO

Durham-Chapel Hill-Carrboro MPO

Triangle Transit Authority

North Carolina DOT  
Public Transportation Division

Triangle J Council of Governments

### PROJECT PARTNERS

The project's Technical Oversight Committee (TOC) consists of about 30 people drawn from:

*The Regional Transportation Alliance*

*local governments*

*MPO and RPO staff*

*NCDOT and NCRR*

*regional institutions like RDU and the Research Triangle Park*

*public and private sector transit service providers*

*universities*

# Regional Transit Infrastructure Blueprint

4. show how current and future land use relates to transit infrastructure investments;
5. provide clear, consistent information related to the cost of investments, the components of these costs, and the assumptions used in developing the costs;
6. analyze travel markets in the transit corridors (trip types, origins and destinations, characteristics, etc.);
7. document how travel results and infrastructure costs relate to eligibility for specific funding sources, particularly federal funding, and what can be paid for with current revenue streams vs. what would require new or increased revenues.

## Analyses & Guiding Principles

The project is built on three technical analyses:

1. A *land use analysis* that examines current and projected development in corridors.
2. A *travel market analysis* that examines travel based on the land use and transportation infrastructure.
3. A *cost analysis* that examines infrastructure costs and implications for funding sources based on federal standard cost categories.

The project's technical oversight committee will help clarify reasons to make major transit investments that decision-makers can draw from in setting priorities based on land use, travel markets and costs. The committee can also work with partners on a cooperative decision making framework for transit investments.

The Blueprint project is *not* designed to have direct public engagement on investment priorities or to establish these priorities, but to be aligned with the public involvement efforts of the Long Range Transportation Plan (LRTP) updates and any other public involvement efforts of the leadership partners. These partners, especially the Joint MPO Committee, are crucial to building consensus.

## Study Area & Corridors

The study area consists of the Triangle Transit Authority's defined service area: Durham, Orange and Wake Counties, plus a 10-mile distance beyond these counties — all or a portion of 14 counties are included.

The corridors are drawn from previous and ongoing plans, studies and reports and include the land use within each corridor. Investments consist of specific alignments, technology, stations and service characteristics.

## Important Transit Decision-Making Considerations

1. Ultimately, it is the MPOs and their Long Range Transportation Plans that establish major transit investment priorities.
2. Several transportation and land use leadership partners are crucial to building consensus on investment priorities, including the two MPOs, the NCDOT, the Triangle Transit Authority, the Regional Transportation Alliance and its partners and the Triangle J Council of Governments.

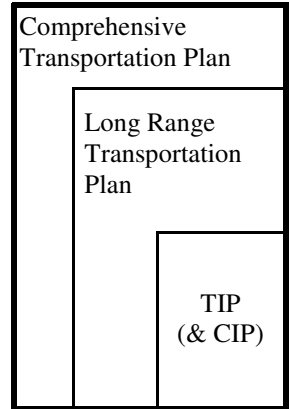
## Where Can You Learn More?

[www.transitblueprint.org](http://www.transitblueprint.org) is a single web gateway created to contain information about:

1. The Transit Infrastructure Blueprint Technical Analysis
2. The Special Transit Advisory Commission that will provide guidance to the MPOs on transit investments.



Light Rail Transit is one example of potential regional transit infrastructure



## How Transit Infrastructure Moves from Desire to Reality

The Comprehensive Transportation Plan (CTP) shows every major transportation project — including transit — that is desired to serve eventual growth in an area.

The Long-Range Transportation Plan (LRTP) shows projects from the CTP that are expected to be built by a certain *horizon year* (currently 2030) and that can be built with anticipated revenues, called *fiscal constraint*.

The Transportation Improvement Program (TIP) shows projects that will be funded over a seven-year period, along with their funding sources. Localities have similar Capital Improvement Programs (CIPs).

The Capital Area MPO and Durham-Chapel Hill-Carrboro MPO prepare each of these documents for their respective metropolitan areas; federal approval is required for LRTPs and TIPs while state approval is required for CTPs and TIPs.



## 2035 Corridor Statistics

Socioeconomic and Travel Markets Data -- 2035			Travel Market Data									Socioeconomic Data		
Corridor (Corridors shown in red rank in the top four for one or more transportation measures among the 18 full corridors)	Corridor Length (miles)	Acres in Corridor Travel Market Places	Total Trips		In-Corridor Trips				Strata 1&2 In-Corridor Trips		Dwelling Units	Jobs	Activity Intensity Measure	
			Daily Trips	Trips/Acre	Daily Trips	Trips/Acre	Trips/Mile	if 2% on transit	Daily Trips	Trips/Acre				
1	Durham to Apex	25	46,016	1,000,000	21	490,000	11	20,000	9,800	110,000	2	88,000	204,000	3
2A	Durham to Raleigh via rail line	28	39,261	1,100,000	29	590,000	15	21,000	11,800	200,000	5	73,000	345,000	5
2B	Durham to Raleigh via busway	28	37,838	1,000,000	26	510,000	14	18,000	10,200	180,000	5	60,000	296,000	4
3	Durham to Raleigh via US 70	23	37,333	1,000,000	27	460,000	12	20,000	9,200	120,000	3	91,000	227,000	4
4	Durham to Burlington	33	47,802	400,000	8	240,000	5	7,000	4,800	70,000	2	30,000	105,000	1
5	Durham to Chapel Hill	21	22,152	800,000	34	450,000	20	21,000	9,000	140,000	6	57,000	175,000	5
6	Durham to North Durham	19	31,816	400,000	13	210,000	6	11,000	4,200	80,000	2	34,000	100,000	2
7	I-40 HOV	46	89,358	1,000,000	12	360,000	4	8,000	7,200	60,000	1	100,000	203,000	2
8	Northern Arc I-540	26	43,154	600,000	14	170,000	4	6,000	3,400	20,000	0	63,000	95,000	2
9	Raleigh to Apex	17	25,215	800,000	32	330,000	13	19,000	6,600	100,000	4	64,000	148,000	4
10	Raleigh to Franklinton	28	83,568	1,100,000	14	650,000	8	23,000	13,000	140,000	2	94,000	222,000	2
11	Raleigh to Fuquay-Varina	21	45,429	600,000	13	280,000	6	13,000	5,600	60,000	1	60,000	107,000	2
12	Raleigh to Selma	29	42,191	500,000	13	250,000	6	9,000	5,000	50,000	1	52,000	110,000	2
13	Raleigh to Zebulon	27	56,745	900,000	16	430,000	8	16,000	8,600	80,000	1	94,000	161,000	3
14	Chapel Hill to RDU via Metro Center	27	32,357	600,000	18	300,000	9	11,000	6,000	80,000	2	44,000	150,000	3
15	Southern Arc NC-540	44	91,220	1,100,000	12	400,000	4	9,000	8,000	40,000	0	110,000	161,000	2
16	Pittsboro to Chapel Hill	24	75,238	600,000	7	370,000	5	15,000	7,400	60,000	1	56,000	80,000	1
17	Chapel Hill to Burlington	37	56,116	400,000	7	240,000	4	7,000	4,800	50,000	1	34,000	77,000	1
<i>Corridor Segments and Combinations</i>														
10.1	Raleigh to I-540 US1 Sub-Corridor	10	16,297	700,000	45	380,000	23	38,000	7,600	110,000	7	49,000	174,000	6
10.2	Cary to Raleigh to I-540 via US1	17	23,641	900,000	38	440,000	19	24,000	8,800	130,000	5	65,000	208,000	5
2A.1	Durham to Metro Center	11	18,037	400,000	23	220,000	12	20,000	4,400	80,000	5	26,000	155,000	4
2A.2	Raleigh to Metro Center	17	27,775	800,000	28	360,000	13	21,000	7,200	110,000	4	51,000	227,000	4
5.1	Chapel Hill to Patterson Place	13	13,430	400,000	29	450,000	33	34,000	9,000	60,000	4	30,000	77,000	4
5.2	Durham to Patterson Place	8	8,773	300,000	38	180,000	21	23,000	3,600	70,000	8	22,000	99,000	6

Totals for Region covered by Model: 1,676,800 10,700,000 1,100,000 1,330,000

Notes:

- In-corridor trips are trips that both begin and end within the corridor.
- Peak trips are trips made between 6-10 am and 3-7 pm.
- Strata 1&2 trips are trips made by households without cars and by low-income households with cars.
- The activity intensity measure is based on the 1997 TTA Station Area Development Guidelines and is derived from Activity Levels 2 and 3 in the Station Area Classification System, where about 3.2 jobs are the equivalent of one dwelling unit in "supporting walk-to-transit" terms. It is calculated by the equation: ((dwelling units + (jobs/3.2))/acres). The activity intensity measure for a corridor as a whole is only valuable in comparing the relative intensity of activity among corridors, not for whether or not fixed guideway transit may be feasible in any particular corridor, since activity thresholds only have meaning when applied to the 1/2 mile walk radius around a station area.
- Values are subject to change based on data reviews, revised socioeconomic estimates and changes to the regional travel demand model
- Indicators for sections of a corridor may differ significantly from indicators for a corridor as a whole.
- Corridors to Burlington and Selma include only data for the portions of these corridors within the boundaries of the Triangle Regional Travel Demand Model.

Travel Analysis Alignment End Points	
Duke University	Apex Town Center
Duke University	Government Center
Duke University	Raleigh Transit Center
Duke University	NCSU via Raleigh CBD
Durham CBD	Burlington Rail Station
Durham CBD	Carolina North via UNC
Duke U via Durham CBD	Person County Line
NC86-Orange County	NC42-Johnston County
I-40 near RTP	US64 Bypass
Government Center	Outer Loop at rail line
NCSU via Raleigh CBD	Franklinton
NCSU via Raleigh CBD	Fuquay-Varina
NCSU via Raleigh CBD	Selma
NCSU via Raleigh CBD	Zebulon
RDU Terminals	Carolina North via UNC
I-40 near RTP	US64 Bypass
Pittsboro Town Center	Carolina North via UNC
UNC-CH Hospitals	Burlington Rail Station
NCSU via Raleigh CBD	Durant Road
Cary CBD	Durant Road
Duke University	Triangle Metro Center
Government Center	Triangle Metro Center
Carolina North via UNC	Patterson Place
Durham CBD	Patterson Place

**DESCRIPTION OF 18 CORRIDORS**

<b>No.</b>	<b>End Points of the initial 18 Corridors</b>	<b>Modified End Points</b>	<b>Comments</b>
1.	Apex to Raleigh	<ul style="list-style-type: none"> <li>■ Apex to Cary</li> <li>■ Duke Medical Center to (Cary to) Downtown Raleigh to Durant Road</li> </ul>	<p>The end points of this corridor were modified to reflect different travel markets and transportation assets:</p> <ul style="list-style-type: none"> <li>■ the corridor between Apex and Cary includes both highways and CSX railroad right-of-way; the travel market reflects predominantly peak hour commuting</li> <li>■ the corridor between Cary and Raleigh includes congested multi-lane highways and NCRR right-of-way; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> </ul>
2.	Durham to Apex	<ul style="list-style-type: none"> <li>■ Durham Multimodal Ctr. to Triangle Metro Center Rail Station (TMC)</li> <li>■ TMC to Apex</li> </ul>	<p>The end points of this corridor were modified to reflect the change in highway options:</p> <ul style="list-style-type: none"> <li>■ the corridor between Durham Multimodal Ctr. and TMC rail station includes NCRR and predominantly NC 147</li> <li>■ the corridor between TMC and Apex includes the Western Wake Parkway (turnpike) and D&amp;S railroad right-of-way</li> <li>■ the travel market reflects predominantly peak hour commuting</li> </ul>
3.	Durham to Burlington	Burlington to Downtown Raleigh	<p>This segment of the NCRR right-of-way was identified as a corridor because of its potential to support the needs of long haul peak hour commuting:</p> <ul style="list-style-type: none"> <li>■ because it is owned and managed by the NCRR, determination of uses within the NCRR corridor does not fall within the jurisdiction of the MPOs</li> <li>■ NCRR is conducting a Shared Corridor Track Expansion Study which will determine the feasibility and cost of providing passenger rail service for long haul commuting in this corridor</li> <li>■ this passenger rail service may operate on tracks that are also used by freight railroads, therefore the technology is limited to commuter trains, similar to Amtrak's locomotives and passenger rail cars</li> <li>■ segments of the Durham to Burlington portion of the NCRR right-of-way are included in other corridors where major transit investments would occur on completely separate alignments constructed for the exclusive use of the rail transit vehicles</li> </ul>

**DESCRIPTION OF 18 CORRIDORS**

<b>No.</b>	<b>End Points of the initial 18 Corridors</b>	<b>Modified End Points</b>	<b>Comments</b>
4.	Durham to Carolina North	<ul style="list-style-type: none"> <li>■ Durham Multimodal Ctr. to UNC Hospital</li> <li>■ UNC Hospital to Carolina North</li> </ul>	<p>The end points of this corridor were modified to reflect different travel markets and transportation assets:</p> <ul style="list-style-type: none"> <li>■ the corridor between Durham Multimodal Ctr. and UNC Hospital includes both multi-lane congested highways and a previously identified and recorded new transit alignment; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> <li>■ the corridor between UNC Hospital and Carolina North includes both roadways and the University Railroad corridor; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> <li>■ the University Railroad corridor is included in NCR Shared Corridor Track Expansion Study</li> </ul>
5.	Durham to North Durham	Durham Multimodal Ctr. to North Durham	The end points of this highway based corridor have not been modified; the travel market reflects predominantly peak hour commuting
6.	Durham to Raleigh via RDU	<ul style="list-style-type: none"> <li>■ Duke Medical Ctr. to TMC</li> <li>■ TMC to NW Cary</li> <li>■ NW Cary to Downtown Raleigh /Government Center</li> </ul>	<p>The end points of this corridor were modified to reflect different travel markets and transportation assets, and facilitate analysis and cost estimating:</p> <ul style="list-style-type: none"> <li>■ corridor numbers 6 and 7 are two routes within the same corridor which includes both congested, multilane highways and NCR railroad right-of-way</li> <li>■ the combined route includes RTP/RDU link currently from the Triangle Metro Center Rail station to RDU; a designated route remains to be developed</li> <li>■ the travel market reflects peak, off-peak and weekend high frequency trip-making</li> </ul>
7.	Durham to Raleigh via RTP	<ul style="list-style-type: none"> <li>■ Government Ctr. to Durant Road</li> </ul>	
8.	Durham to Raleigh via US-70	Durham Multimodal Ctr. to Downtown Raleigh	This corridor, which was added by the STAC, is highway based; the travel market reflects predominantly peak hour commuting

**DESCRIPTION OF 18 CORRIDORS**

<b>No.</b>	<b>End Points of the initial 18 Corridors</b>	<b>Modified End Points</b>	<b>Comments</b>
9.	I-40 Corridor: Wake/Johnston County boundary to NC 86	<ul style="list-style-type: none"> <li>■ Wake/Johnson County boundary to TMC</li> <li>■ TMC to NC 86</li> </ul>	<p>The end points of this predominantly highway based corridor have been modified to reflect the potential for linking different corridors that may include different technologies:</p> <ul style="list-style-type: none"> <li>■ portions of the corridor include railroad rights-of-way</li> <li>■ the travel market reflects predominantly peak hour commuting</li> </ul>
10.	Northern Arc of I-540	I-540	This corridor, which was added by the STAC, is highway based. The travel market reflects predominantly peak hour commuting
11.	Pittsboro to Carolina North	<ul style="list-style-type: none"> <li>■ Pittsboro to UNC Hospital</li> <li>■ UNC Hospital to Carolina North</li> </ul>	<p>The end points of this corridor were modified to reflect different travel markets and transportation assets:</p> <ul style="list-style-type: none"> <li>■ the corridor between Pittsboro and UNC Hospital is highway based; the travel market reflects predominantly peak hour commuting</li> <li>■ the corridor between UNC Hospital and Carolina North includes both roadways and the University Railroad right-of-way; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> <li>■ the University Railroad is included in NCRR Shared Corridor Track Expansion Study</li> </ul>
12.	Raleigh to Franklinton	<ul style="list-style-type: none"> <li>■ Downtown Raleigh/ Government Ctr. to Durant Road</li> <li>■ Durant Road to Wake Forest</li> <li>■ Wake Forest to Franklinton</li> </ul>	<p>The end points of this corridor were modified to reflect different travel markets and transportation assets:</p> <ul style="list-style-type: none"> <li>■ between Downtown Raleigh and Durant Road (just north of I-540) the corridor includes congested multilane highways with limited expansion capacity and CSX Railroad right-of-way; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> <li>■ the Durant Road and Wake Forest, and the Wake Forest and Franklinton segments of this corridor include congested highways and CSX Railroad right-of-way; the travel market reflects predominantly peak hour commuting</li> </ul>
13.	Raleigh to Fuquay-Varina	Downtown Raleigh to Fuquay-Varina	The end points of this corridor which has both highways and railroad rights-of-way, have not been modified; the travel market reflects predominantly peak hour commuting

**DESCRIPTION OF 18 CORRIDORS**

<b>No.</b>	<b>End Points of the initial 18 Corridors</b>	<b>Modified End Points</b>	<b>Comments</b>
14.	Raleigh to Selma	Selma to Downtown Durham	<p>This segment of the NCRR right-of-way was identified as a corridor because of its potential to support the needs of long haul peak hour commuting.</p> <ul style="list-style-type: none"> <li>▪ because it is owned and managed by the NCRR, determination of uses within the NCRR corridor does not fall within the jurisdiction of the MPOs</li> <li>▪ segments of the Raleigh to Selma portion of the NCRR right-of-way are included in other corridors where major transit investments would occur on completely separate alignments constructed for the exclusive use of the rail transit vehicles</li> <li>▪ additional information pertaining to this corridor is included in comments about the Durham to Burlington corridor</li> </ul>
15.	Raleigh to Zebulon	Downtown Raleigh to Zebulon	<p>The end points of this corridor which has both highways and railroad rights-of-way, have not been modified; the travel market reflects predominantly peak hour commuting</p>
16.	RDU to Carolina North	<ul style="list-style-type: none"> <li>▪ RDU to RTP/TMC</li> <li>▪ TMC to NC 54 to UNC Hospital</li> <li>▪ Durham to UNC Hospital</li> <li>▪ UNC Hospital to Carolina North</li> </ul>	<p>The end points of this corridor were modified to reflect different transportation assets and travel markets within each segment and allow for the interface or linking of different corridors that may have the same or different technologies:</p> <ul style="list-style-type: none"> <li>▪ between RDU and RTP/TMC the corridor includes both highways and NCRR right-of-way</li> <li>▪ between TMC, NC 54 and UNC Hospital two corridors converge, both include congested multilane highways and/or a previously identified and recorded new transit alignment; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> <li>▪ the corridor between Durham Multimodal Ctr. and UNC Hospital includes congested multilane highways and a previously identified and recorded new transit alignment; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> </ul>

**DESCRIPTION OF 18 CORRIDORS**

<b>No.</b>	<b>End Points of the initial 18 Corridors</b>	<b>Modified End Points</b>	<b>Comments</b>
			<ul style="list-style-type: none"> <li>▪ the corridor between UNC Hospital and Carolina North includes both roadways and the University Railroad corridor; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> </ul>
17.	Southern Arc NC-540	Triangle Expressway Turnpike: Southern and Eastern segments	<p>The end points of this highway based corridor have not been modified</p> <ul style="list-style-type: none"> <li>▪ these highways segments are anticipated to be implemented as turnpikes</li> <li>▪ the travel market reflects predominantly peak hour commuting</li> </ul>
18.	UNC Hospital to Burlington	<ul style="list-style-type: none"> <li>▪ UNC Hospital to Carolina North</li> <li>▪ Carolina North to Hillsborough</li> <li>▪ Raleigh (to Hillsborough) to Burlington</li> </ul>	<p>The end points of this corridor were modified to reflect different travel markets and transportation assets:</p> <ul style="list-style-type: none"> <li>▪ the corridor between UNC Hospital and Carolina North includes both roadways and the University Railroad corridor; the travel market reflects peak, off-peak and weekend high frequency trip-making</li> <li>▪ the corridor between Carolina North and Hillsborough includes railroad rights of way and highways; the travel market reflects predominantly peak hour commuting</li> <li>▪ both the University Railroad and the Raleigh to Burlington corridors are included in NCRR Shared Corridor Track Expansion Study; see comments related to the Durham to Burlington corridor</li> </ul>

## **Appendix D: Questions and Answers**

The following information has been prepared in response to questions and issues raised by members of the Special Transit Advisory Commission (STAC) and in public comments.

### **List of Topics**

- Transit Access to RDU International Airport
- Alternative Technologies
- Why these corridors?
- Combining Rail Technologies
- Transfers from one transit vehicle to another
- Guidelines to help Communities Develop Transit Supportive Land Use
- Technologies within the North Carolina (NCRR) and CSX Rail Road Corridors
- Study being undertaken by North Carolina Railroad (NCRR)
- Property Acquisition versus the use of Existing Transportation Rights-of-way
- How much time would it take to implement high frequency rail in the Durham to Raleigh corridor?
- Schedule for Commencement of Commuter (rush hour) Rail Service
- Information about the Burlington to Goldsboro and Apex to Wake Forest Corridors
- Issues related to the Raleigh-Durham Corridor
- Transportation costs
  - Cost of Construction Materials
  - Highway and Transit Development Costs
  - Cost of Fuel
  - Cost of Congestion
  - Energy Use and Public Transportation
  - Average Cost of Driving in North Carolina

## **Transit Access to RDU International Airport**

*Transit to RDU Airport should connect passengers directly to the terminal area. Direct airport access must be a part of a major regional transit investment. Connecting two downtowns and not RDU was doomed for ridership.*

### ■ Transit access to RDU Airport

Raleigh-Durham International Airport (RDU) is currently served by 12 major airlines and 19 regional and cargo operators which generate nearly 450 daily flight arrivals and departures. In 2007 over 10.04 million passengers used RDU; generally divided equally between business and leisure travel. There are over 11,000 public parking spaces in the terminal area and an additional 7,000 spaces in park and ride facilities. An estimated 4,500 airport employees work day, night and variable shifts.

Currently, Regional Bus Service is available to RDU passengers during the week, from 6:30 AM to 10.00 PM every 30 minutes during peak hours and every 60 minutes off peak. On Saturdays hourly service operates from 7:30 AM to 5:30 PM. Transit passengers are linked to the RTP Regional Bus Transfer Center from which they make bus connections to Raleigh, Durham, Cary and Chapel Hill. Weekday evening service to the airport from Raleigh, Durham and Chapel Hill does not require a transfer.

As a result of collaborative efforts between the RDU Airport Authority and Triangle Transit, the 2006 regional rail project linking Durham and Raleigh included a transit connection between the Triangle Metro Center Station and RDU. In spring, 2002 representatives from the RDU Authority Board and the Triangle Transit Board of Trustees formed a Steering Committee to oversee the Airport Rail Link Study, the purpose of which was to identify technology and alignment options to link RDU with the regional rail system and to assess the feasibility of those options to determine if and when an airport-to-rail-link could be implemented. The study identified needed service characteristics of the link and appropriate technologies. It included surveys of airport employees and airline passengers (both visitors and area residents); estimated costs and ridership potential and evaluated options against a set of service objectives, leading to recommendations for implementation of an airport-to-rail-link service. The Airport Rail Link Study was provided to the STAC at their May 2, 2007, meeting on a CD of prior studies and corridor plans.

The conclusions of the study reaffirmed the need for an airport-to-rail-link and also recommended that it would be premature to make final decisions on a specific alignment and technology given the number of interdependent issues that would ultimately influence an airport-to-rail-link. For example, airport improvements such as consolidation of the rental car facilities and implementation of an airport people mover system would need to occur prior to implementation of an airport-to-rail-link. Other issues that would influence decisions on the airport-to-rail-link include studies looking at premium bus service on highway improvements; the nature of development at the Globe Road Center and Brier Creek Developments and determination of how to upgrade regional bus shuttle service to the airport. The Steering Committee concurred on the need for ongoing coordination and, subsequent to the study's conclusion in March 2003, regional bus service to the airport was upgraded.

Recent discussions with RDU staff confirmed the airport's ongoing plans to consolidate rental car facilities in a hub west of the terminals and runway, with the hub identified as the location to which the airport-to-rail-link would connect. Access between the hub and the airport terminals is initially anticipated to be provided by shuttle buses which would, at some future date, be replaced by a people mover system. At the October 31, 2007 STAC Meeting the general manager of RDU reaffirmed the airport's ongoing willingness to develop an airport-to-rail link as previously envisioned and currently included in the STAC's recommendations for major regional transit infrastructure investments.



- **Airport-transit access in other cities**

Access to major metropolitan airports in the US is being accomplished in a variety of different ways. Airports provide short term parking and drop off/pick up areas; long term structured parking typically within walking distance of the terminals and remote parking connected to the terminal by no-cost shuttle buses. Taxis, private and hotel-related shuttles and/or scheduled bus service are usually available at larger airports.

In the US, 15 airports have direct rail transit access including Atlanta; Baltimore; Chicago O'Hare and Midway; Minneapolis; St Louis; San Francisco and Washington National (American Public Transit Association [APTA]). Dallas-Fort Worth; Harrisburg, PA; Phoenix; Seattle-Tacoma, and Washington Dulles airports anticipate replacing current shuttle bus or busway-to-rail connections with direct rail transit access within the next 9 years (National Association of Railroad Passengers [NARP]). Boston's Logan; Los Angeles; Miami; and San Jose/Santa Clara are among the 13 airports which only have bus-to-rail station access (NARP). Most of the remaining metropolitan airports have scheduled municipal/regional bus service which varies in terms of frequency, hours of operation, weekday and weekend schedules.

These statistics reflect the fact that in making decisions about major highway and rail transit investments, the type of service, its capacity and route are based in large part on the volume of daily morning peak hour traffic. By supporting the demand for the largest consistent travel market, which is usually morning work trips, both highways and major transit systems are anticipated to meet a reasonable cross section of other types of trips made by the communities within the service area.

### **Alternative Technologies**

*Why aren't cutting edge technologies such as Maglev being considered?*

The MPOs identified types of transit technologies most appropriate for our region based on a variety of factors including the region's anticipated need for transportation capacity over the next 30 to 50 years; examples of comparable, successful transit service including operations and maintenance; long-term capacity for expansion and enhancement; environmental impact, type of propulsion and energy consumption; capital and operating costs; community acceptability; proven effects on land use and other related attributes.

For these reasons, technologies such as personal rapid transit (PRT), electrified heavy rail (metro or subway systems), monorail and maglev trains are among those not included in the STAC's deliberations.

Maglev is short for magnetic levitation, which means that trains float over a guideway and do not have the type of engines that are typically used to power trains along steel tracks. Instead, maglev trains are propelled by a magnetic field embedded in guideway walls and the track.

Even though the concept of magnetic levitation was proposed over a century ago, only China, Japan and Germany are working with powerful electromagnets to propel high speed maglev trains. Several other countries have plans to build their own maglev trains, but the Shanghai airport line remains the only commercial maglev line. It links the Longyang Road station at the city's center to Pudong airport and travels at an average speed of 267 mph, completing the 19 mile trip in less than 10 minutes. A 99 mile extension of the Shanghai line (to Hangzhou) is anticipated to be completed by the 2010 Shanghai Expo. This will be the first maglev rail line to run between two cities.

U.S. cities including Los Angeles, Las Vegas and Pittsburgh have contemplated maglev trains, but with typical capital costs of \$100 to \$150 million or more per mile, building maglev transportation has remained cost prohibitive.

Using a different application of maglev, Old Dominion University in Virginia had hoped to have a super shuttle that would move students across campus by fall 2002. While this public-private initiative was not completed, a subsequently funded university research project was able to levitate a vehicle. Implementation of that project has been put on hold, however the University anticipates receiving federal funding in the near future that will support continued research. Unlike other maglev systems which are powered through the guideway walls and tracks, the University's research is focused on small 4 to 5 passenger vehicles that would be individually powered. This approach is anticipated to cost less than the guideway/track powered approach.

**Why these corridors?**

*The Special Transit Advisory Commission has confined their review of opportunities for major transit investments to certain specific corridors. How and why were these corridors selected?*

The Triangle Region has two Metropolitan Planning Organizations (MPOs): Durham-Chapel Hill-Carrboro MPO and Capital Area MPO. These MPOs have been designated by the federal government as the agencies with overall responsibility for transportation planning and development in Durham, Orange and Wake Counties as well as portions of Chatham, Franklin, Granville, Harnett and Johnston Counties. In the context of the MPOs' transportation planning efforts and the work of the STAC, these counties and communities are collectively referred to as the study area.

On the basis of previous and ongoing studies, plans and reports undertaken by the MPOs as well as the state and local governments, 16 corridors were initially identified by the MPOs for consideration by the STAC. Based on additional input from the STAC, two more corridors were subsequently included.

Identified by their primary end points, the corridors link a majority of the concentrations of urbanized development within the multi-county study area. In addition to the primary end points, some of the corridors may be segmented to reflect areas with more similar characteristics.

Throughout the course of the STAC's deliberations, some of the corridors were modified or broken into segments as shown on the table below. In general, the original and revised descriptions include the same locations.

	<b>End points of the Initial 18 Corridors</b>	<b>Reconfigured Corridors</b>
1.	Apex to Raleigh	<ul style="list-style-type: none"> <li>■ Apex to Cary</li> <li>■ Duke Medical Center to (Cary to) Downtown Raleigh to Durant Road</li> </ul>
2.	Durham to Apex	<ul style="list-style-type: none"> <li>■ Durham Multimodal Center to Triangle Metro Center Rail Station (TMC)</li> <li>■ TMC to Apex</li> </ul>
3.	Durham to Burlington	Burlington to Downtown Raleigh
4.	Durham to Carolina North	<ul style="list-style-type: none"> <li>■ Durham Multimodal Center to UNC Hospital</li> <li>■ UNC Hospital to Carolina North</li> </ul>
5.	Durham to North Durham	Durham Multimodal Center to North Durham

6.	Durham to Raleigh via RDU	<ul style="list-style-type: none"> <li>▪ Duke Medical Center to TMC</li> <li>▪ TMC to NW Cary</li> </ul>
7.	Durham to Raleigh via RTP	<ul style="list-style-type: none"> <li>▪ NW Cary to Downtown Raleigh / Government Center</li> <li>▪ Government Center to Durant Road</li> </ul>
8.	Durham to Raleigh via US-70	Durham Multimodal Center to Downtown Raleigh
9.	I-40 Corridor: Wake/Johnston County boundary to NC 86	<ul style="list-style-type: none"> <li>▪ Wake/Johnston County boundary to TMC</li> <li>▪ TMC to NC 86</li> </ul>
10.	Northern Arc of I-540	NC-540
11.	Pittsboro to Carolina North	<ul style="list-style-type: none"> <li>▪ Pittsboro to UNC Hospital</li> <li>▪ UNC Hospital to Carolina North</li> </ul>
12.	Raleigh to Franklinton	<ul style="list-style-type: none"> <li>▪ Downtown Raleigh / Government Center to Durant Road</li> <li>▪ Durant Road to Wake Forest</li> <li>▪ Wake Forest to Franklinton</li> </ul>
13.	Raleigh to Fuquay-Varina	Downtown Raleigh to Fuquay-Varina
14.	Raleigh to Selma	Selma to Downtown Durham
15.	Raleigh to Zebulon	Downtown Raleigh to Zebulon
16.	RDU to Carolina North	<ul style="list-style-type: none"> <li>▪ RDU to RTP/TMC</li> <li>▪ TMC to NC 54 to UNC Hospital</li> <li>▪ Durham to UNC Hospital</li> <li>▪ UNC Hospital to Carolina North</li> </ul>
17.	Southern Arc I-540	Triangle Expressway Turnpike
18.	UNC Hospital to Burlington	<ul style="list-style-type: none"> <li>▪ UNC Hospital to Carolina North</li> <li>▪ Carolina North to Hillsborough</li> <li>▪ Raleigh (to Hillsborough) to Burlington</li> </ul>

### **Combining Rail Technologies**

*Why does the Regional Transit Vision Plan include 2 rail technologies?*

The Regional Transit Vision Plan recommends the use of Light Rail Transit (LRT) in the UNC Hospital to Durham Multimodal Center corridor and Diesel Multiple Unit (DMU) rail transit in the Duke Medical Center to Triangle Metro Center to NW Cary to Downtown Raleigh to Durant Road corridor. Selecting the appropriate technology for transit service includes, but is not limited to, consideration of the physical and regulatory aspects of corridor in which it will operate; the desired service concept; the capital and operating costs, and the opportunities that different technologies present.

The initial alternatives analysis for the Chapel Hill to Duke Medical Center to Downtown Raleigh to Durant Road Corridor examined corridors and alignments that would provide commuters with the most time-competitive, cost effective alternatives to driving in congested corridors. Among those considered were alignments that would have required substantial retrofitting of highways; the

acquisition of new rights-of-way within which to operate transit vehicles, and the use of under utilized or vacant space within existing railroad corridors on which separate tracks would need to be built.

For the corridor between Chapel Hill and Duke University Medical Center, a combination of the University Railroad and NCRR corridors; a new right-of-way paralleling the US 15-501 corridor and retrofitting of the US 15-501 highway were examined. A general alignment within a new right-of-way paralleling US 15-501 was selected as the most reasonable and feasible, primarily because it attracted the most ridership; was the shortest connecting link between Durham and Chapel Hill and had the potential to spur the greatest amount of economic development. Given the environs of the selected corridor, initial technology options included LRT vehicles and bus rapid transit (BRT). The final alignment and technology will be determined through the Environmental Impact Statement (EIS) process. DMU rail transit was not one of the preferred technologies because the land use characteristics of this corridor would be better served by a transit vehicle capable of making tighter turns and more frequent stops that were typically less than 1 mile apart.

For the corridor between Duke University Medical Center, Downtown Durham, RTP/RDU, Morrisville, Cary, the Fairgrounds, NCSU, Downtown Raleigh and the Government Center, and North Raleigh to Durant Road several alternative alignments have been studied. These included unused portions of the NCRR and CSX Railroad corridors; acquiring new right-of-way and retrofitting several highways that would serve the destinations within this corridor.

Development of exclusive tracks within the NCRR and CSX corridors was determined to be the best option primarily because it connected key regional activity centers identified by the local governments; station locations already had and/or could sustain higher density transit supportive development which would enhance ridership and generate ongoing economic returns on investment in rail transit, and, because it uses an existing transportation corridor, the project could be delivered more quickly and with less community disruption. DMU rail technology can operate parallel to freight tracks within the railroad rights-of-way; attract ridership comparable to LRT (which would require a new right-of-way); as a regional connector along which the stations were typically spaced more than a mile apart, the DMU was operationally more suitable because of its combustion engines (with slower acceleration and deceleration than electrically powered vehicles); DMUs are bi-directional (they can be driven from either end) and they are designed allow the number of train cars to be increased or reduced with relative ease, in order to meet peak, off peak and special event travel demand.

In addition to this, a decision made by the Federal Railroad Administration (FRA), which was upheld by the US Fourth Circuit Court of Appeals (*Research Triangle Regional Public Transportation Authority vs. United States of America, Federal Railroad Administration, No. 03-1283, 2003*) determined that the previously proposed rail transit service in this corridor was *inter-regional* and subject to FRA jurisdiction, thereby necessitating the exclusive use of FRA compliant rail vehicles and excluding lighter bodied vehicles such as LRT and buses. This inter-regional designation is not expected to change. More recently, at a STAC meeting in the fall of 2007, representatives from Norfolk Southern Railroad (NSR) and CSX Railroad indicated that because of safety and operational concerns they could not support the operation of non-FRA compliant vehicles in corridors which they lease, own or operate.

Throughout the country many successful transit systems use more than one (fixed guideway) technology because communities need different types of service concepts connecting a variety of markets with diverse environs. Dallas Area Rapid Transit (DART) operates LRT and traditional diesel locomotives with passenger cars (rush hour/commuter rail), while people in San Francisco, San Jose, San Diego and Los Angeles are able to choose from LRT, Metro/Rapid Rail (subways) and diesel powered Commuter Rail. Transit systems in Baltimore, Portland, Salt Lake City and

Seattle operate two or more types of rail transit and Charlotte is moving forward to combine their highly successful LRT system with commuter rail service.

### **Transfers from one Transit Vehicle to Another:**

*Concerns have been expressed about the need for transfers; the preference is to have one-seat rides.*

In a multi-origin, multi-destination region such as the Triangle, any higher-order transit system will not be free of transfers. In fact, it is probably more likely to have transfers than a single, central city with a hub-and-spoke transit network (Boston, Chicago, Charlotte). In these single centered cities, there are multiple origins but a smaller set of destinations, and one primary destination zone.

The Washington Metro which serves Washington DC, was designed for all stations to be accessible to all other stations with one transfer. That said, it is typically faster than driving or a one-transfer trip, to take a 2- or even 3-transfer trip on the Washington Metrorail/Metrobus network. A reasonable goal in a region like the Triangle would be to have a higher-order transit network that has no more than 2 transfers for most riders.

When a transit system is well-coordinated and reliable, transfers become much less of an issue. A well-coordinated system means that schedules are organized so that the time to make a transfer is relatively short. A reliable system helps eliminate uncertainty over making a transfer by making arrival/wait/departure times consistent and predictable; increasing the frequency of transit service also makes transfers simpler by reducing waits. Finally, the overall quality of the experience has considerable effect on how transfers are perceived by users. A transfer in a location with comfortable seating, shelter from the elements and nearby options for other activities (e.g. a coffee shop or snack vendor), especially if coupled with reliable system operation and real-time information on when the next transit vehicle will arrive, is unlikely to deter people from using transit.

Using the same vehicles on multiple train and bus routes can help reduce transfers, but will not eliminate them. Ultimately, the best method for eliminating transfers is to allow significant development of jobs and housing near high frequency fixed guideway transit stations.

Examples of communities that show how people have chosen to live near high frequency rail transit stations include Charlotte, NC where residential development and occupancy began in advance of construction of the Light Rail Transit system. The same is true for employers, such as Bell South in Atlanta which has relocated and expanded their administrative offices within walking distance of three transit stations; thereby providing more cost effective opportunities for the employees who commute to work and reducing the employer's parking investments. (This also promotes walking and a healthier lifestyle: another objective of many employees and their employers today.) The anticipated demographics of the 800,000 people likely to move to the Triangle Region within the next 25 to 30 years, suggest that a substantial number will seek urban, transit supported environments in which to live and work.

### **Guidelines to help Communities develop Transit Supportive Land use**

*What would be needed to make (support) a rail investment in some of those low-density corridors? What would be needed on the governance and policy sides as well? We could produce some guidelines that people could use to include in their growth patterns.*

Experience nationwide has demonstrated that the success of transit investments can be attributed to a variety of factors. In 1997, local governments in Durham, Orange and Wake Counties generated a

document that included design guidelines, implementation tools and strategies to support compact, mixed use, walkable development in appropriate locations. A companion educational brochure entitled “Towards More Livable Communities” was also developed for more general distribution. A copy of the Station Area Development Guidelines was included on the CD of reference documents provided to the STAC at its first meeting.

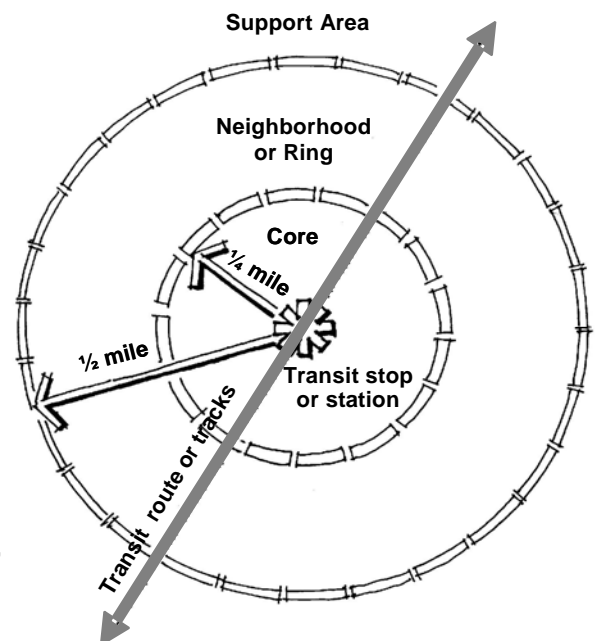
The Guidelines explain the relationship between pedestrian-oriented land uses and multi-modal transportation; identify mechanisms through which the built environment and market demands may be combined to achieve more livable, transit-supportive communities; provide a practical set of tools that the development community, governments and neighborhoods may use to achieve compact, mixed-use, walkable communities; and facilitate the development and implementation of neighborhood and community plans that will attract additional residential and non-residential development.

Local governments throughout the region have used the Guidelines as a basis for preparing specific local planning and development tools and/or incorporated the Guidelines into their comprehensive plans and/or adopted them. As identified in the Guidelines, land use and consistently applied public policy are two of the most significant issues that communities must address in order to support transit.

In general, ridership on high frequency rail transit is a direct reflection of the degree to which development adjacent to a stop or station is compact (density), mixed-use and walkable as well as bicycle friendly. Ridership on rush hour only fixed guideway transit service (usually limited to weekday, morning and evening peak hour transit service) is more often influenced by the convenience and capacity of park and ride facilities than walk, or bike to transit options.

Planning for development that supports high frequency rail transit is generally focused on the area that is within reasonable walking distance of a transit stop or station. This distance can be extended to 3 miles or more by a comprehensive system of on-street lanes and off-street paths for bicyclists. The “station area” or planning zones usually includes three expanding concentric zones in which the nature and density of development, and type of access to, from and around the transit stop or station may vary as follows:

- **The Core**
  - ¼ mile radius around the station or stop
  - typically a 5 minute walk or a short trip on a bus or bike
  - higher density, mixed land use including office, retail and service businesses, residential and compatible community facilities (such as childcare, cultural facilities, public agencies, urban parks)
- **The Neighborhood or Ring**
  - ¼ to ½ mile radius around the station or stop
  - typically a 10 to 15 minute walk or a short trip on a bus or bike
  - medium density, mixed land use including office, retail and service businesses, residential and compatible community facilities



**Transit Stop or Station Area  
Planning Zones**

- The Support Area
  - ½ to approximately 1½ mile radius – or more
  - typically a 20 (or more) minute walk or trip on a bus or bike
  - 1 to 3 miles or more would include longer walks, buses, bikes and park and ride lots
  - development intensity is likely to vary, relative to the development which surrounds the overall transit station or stop. Mixed, medium density land use may continue in support of the Neighborhood / Ring Area and lower density development including retail and service businesses serving large markets may occur

While the overall density around different transit stations may vary, experience around the nation has consistently shown that there are minimum concentrations of people (living and working) that need to be present in order to generate a sufficient number of transit passengers. Activity level 2 on the Minimum Housing Density and Floor Area Ratio (FAR) table shown below reflects baseline densities that are being applied throughout the country to support high frequency rail transit investments.

Station areas in different communities may not start out with development densities that would ultimately support high frequency rail transit, but market opportunities and public policies, such as design standards, zoning and other development requirements that support the implementation of compact, mixed-use, walkable development must be there.

The following table illustrates minimum levels of residential and non-residential development that would support high frequency rail transit.

**Minimum Housing Density and Floor Area Ratio (FAR)\***

Activity Level	Residential Gross Density Units per acre			Non-Residential Density Floor Area Ratio (FAR)*		
	Core	Neighborhood or Ring	Density Range (0 to ½ mile) (Av. Units/Ac)	Core	Neighborhood or Ring	FAR Range (0 to ½ mile) (Av. # Employees/Ac)
1**	10	4	10 to 4 (7)	0.3	0.15	.30 to .15 (24)
2	15	7	15 to 7 (11)	0.5	0.20	.50 to .20 (35)
3	22	10	22 to 10 (16)	0.7	0.25	.70 to .25 (52)
4	45	15	45 to 15 (30)	1.0	0.30	1.0 to .30 (113)

\* FAR is the ratio of the gross floor area of a building to the area of the building's site. On a one-acre site (208 ft by 208 ft or 43,560 sq. ft.) with a FAR of 1.0, the gross square footage of the building could not exceed 43,560 sq. ft. Other aspects of the building site such as building placement, entrance(s), parking, development regulations, etc., would help to define the number of floors in the building.

\*\* Activity Level 1 includes residential and non-residential densities that would support local bus service, carpools and vanpools, however they are too low for high frequency rail transit.

The likelihood that people will walk to and from a transit station may be influenced by a variety of things. The perception of a reasonable walking or bicycling distance varies based on such factors as a sense of safety, the presence of interesting and diverse activities/destinations along the route, the quality and consistency of pedestrian and bicycle facilities, traffic volumes and speeds, physical barriers or steep hills and weather.

Well-lighted interconnected street networks that support two-way traffic, bicycle access, on-street parking on one or both sides (or parking structures), and sidewalks separated from the curb by street trees form the backbone of transit supportive development. On average people will walk 5 to 15 minutes to access transit, which is the equivalent to ¼ to ½ mile. There is evidence that people are willing to walk longer distances to access rail transit service, (often 20 minutes or more) particularly along streets with continuous sidewalks that are part of a network clear, comfortable direct linkages between residential and employment areas and the transit stop or station.

To put these times and distances in perspective, a pedestrian would cover just under ½ mile by using the sidewalk to travel completely around the State Capitol. The walk between Memorial Auditorium and the Capitol is just over ½ mile. At both Triangle Town Center and the Streets of Southpoint, the distance between the central core and the anchor stores at the end of each wing is close to 1/3 of a mile.

Some of the other elements that are essential to support transit include well designed streetscapes; open space and other aspects of the public realm that support social, cultural and recreational opportunities essential for the vitality of urban living; building placement and design; a mix of complimentary uses within more dense development, adequate roadway networks (along with the pedestrian and bicycle networks) and parking.

Public policies must be in place to ensure that public and private development surrounding transit stops and stations includes these key elements. Transit stations are typically located at existing activity centers where market opportunities already exist. While investment in high frequency rail transit does not create markets; transit systems around the country continue to demonstrate that they focus growth and enhance market viability. Also evident are increases in the quantity and quality of development in the places which are served by rail transit systems. This may be a reflection of its permanence and the number of successful rail transit systems around the country. Increasingly, developers and the investment community appear more inclined to move forward with development which is denser, mixed use and supportive transit supportive once implementation of high frequency rail transit is certain or highly probable.

There is no single formula for implementing development which is compact, mixed-use and transit supportive but there are some common elements in communities which have successful transit systems. They include planning and land use tools, development incentives and financial and development options.

Communities which develop, adopt and implement plans for compact, mixed-use, walkable downtowns and neighborhoods in advance of specific development proposals, enhance the likelihood of successfully integrating transit service and development into their community's vision. Local governments may streamline the permitting process for projects which are consistent with the adopted transit oriented development plans, making these kinds of development more attractive to developers by reducing project approval time and risk.

Parking management is another important tool which allows both the public and private sector to develop facilities that enhance rather than compete with transit services. The location, quantity and pricing of parking directly impacts transit use. Communities may also choose to partner with the private sector to increase their tax base through denser development.



## **Technologies within the North Carolina (NCRR) and CSX Railroad Corridors**

*(Instead of using diesel fueled vehicles,) why aren't we using electrical power (e.g. light rail vehicles) which is cleaner? Can BRT run in the rail corridor?*

Among the broad cross section of safety regulations established by the Federal Railroad Administration (FRA) are minimum distances between certain types of freight and passenger rail operations and crashworthiness standards which are applied to vehicles operating in railroad corridors. FRA compliant rail vehicles are generally heavier than light rail vehicles and include substantial steel bodies and other features that are designed to provide safety in the event of an accident involving a freight train or heavy rail passenger train. In addition to the standard "push pull" locomotives and passenger rail vehicles generally used by Amtrak and commuter rail agencies, diesel multiple unit (DMU) rail vehicles can also be manufactured to meet crashworthiness standards determined through FRA testing of the vehicles. Light Rail Transit (LRT) vehicles and buses are lighter and do not have the heavy steel bodies and other features which meet FRA crashworthiness standards.

In 2003, as required by federal regulations, previous plans for rail transit service between Durham, RTP, Cary, downtown Raleigh and north Raleigh, in the NCRR and CSX railroad corridors, were submitted to the Federal Transit Administration (FTA) and the FRA. The FRA made a determination that the proposed rail transit service was *inter-regional* (not an "urban rapid transit system") and subject to FRA jurisdiction, thereby necessitating the exclusive use of FRA compliant rail vehicles. Triangle Transit's appeal of this matter was denied by the US Fourth Circuit Court of Appeals. (Research Triangle Regional Public Transportation Authority v. United States of America, Federal Railroad Administration, No. 03-1283, 2003).

Therefore, FRA's *inter-regional* classification of the previous plan for rail transit service between Durham, RTP, Cary, downtown Raleigh and north Raleigh in the NCRR and CSX railroad corridors is the basis on which LRT, BRT and other non-FRA compliant vehicles are not being pursued for NCRR corridors in the STAC plan. Further, the use of electrically powered vehicles (either FRA compliant or non-FRA compliant) in the railroad corridors has not been considered due to the cost of constructing and maintaining an electrification system and the operational and safety issues involved with conducting freight operations in close proximity to electrified passenger operations.

NCRR has stated that it allows the operation of LRT vehicles in corridors it controls however, any transit operations must comply with federal requirements (which vary depending on whether the particular service falls under FTA or FRA jurisdiction). According to NCRR, in situations where federal requirements allow LRT vehicles to share a rail corridor with freight operations, the amount of clearance between the freight operations and light rail operations would be a function of future expansion needs for freight and passenger service, federal safety requirements and the type of transit vehicles used. The amount of clearance required would be between 26 and 60 feet (for a letter to the STAC from the NCRR on this topic, please see Appendix J). The amount of clearance required is an important cost consideration as it dictates the amount of right of way that must be acquired for transit.

## **Study being undertaken by the North Carolina Railroad (NCRR)**

*Does the study being undertaken by the North Carolina Rail (NCRR) affect any of the corridors identified in the STAC Process? What does the study entail?*

The North Carolina Railroad (NCRR) corridor is 317 miles long and stretches from Charlotte to Morehead City. Eight Amtrak inter-city passenger trains and over 70 freight trains operate daily, primarily on single tracks, within segments of the NCRR corridor.

The corridor from Burlington to Selma, which has been identified through the STAC process, is within the NCRRC corridor. Initially this corridor was described in three segments:

- Durham to Burlington;
- Durham to Raleigh via Triangle Metro Center, and
- Raleigh to Selma.

In October 2007, the NCRRC announced the Shared Corridor Track Expansion Study (Study) which is being undertaken to determine track expansion feasibility, costs and standards for commuter (rush hour) rail service.

The Study is based on the following assumptions:

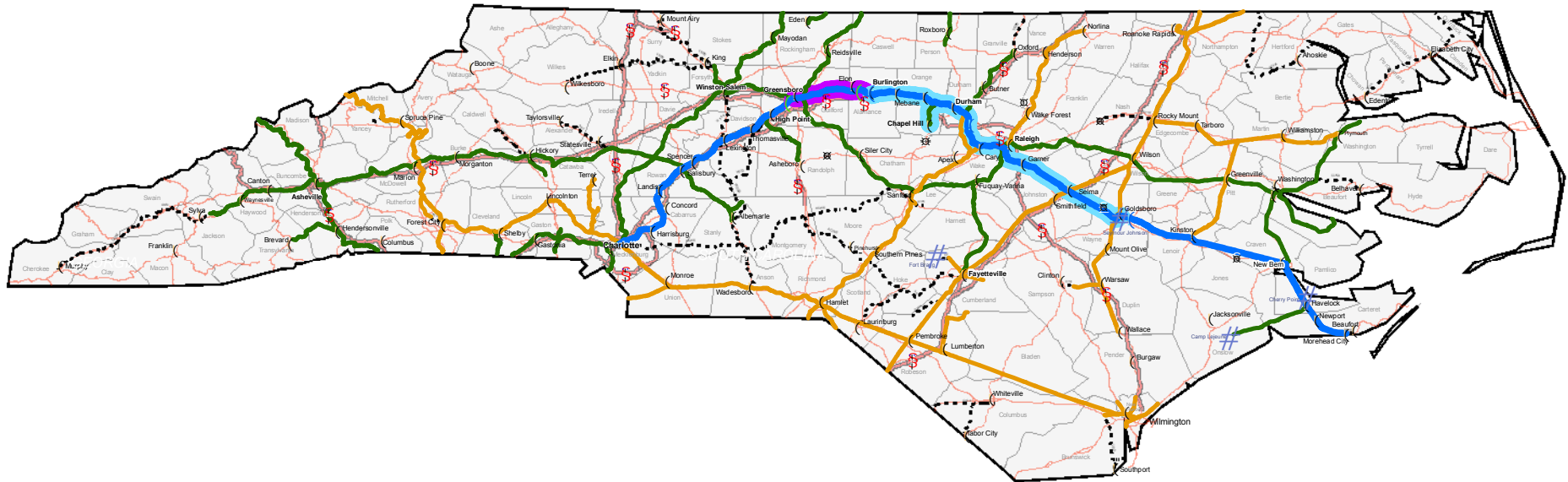
- Corridors
  - Burlington to Greensboro
  - Burlington to Goldsboro
  - Hillsborough to Chapel Hill/Carrboro along the University Railroad / Chapel Hill-Carrboro Branch
- Service Concepts & Equipment
  - 4 peak hour trains in each direction plus one mid-day (commuter/rush hour rail)
  - locomotive and push-pull rail cars (FRA compliant equipment)
  - no operating agency or organization has been identified

Previous reviews have indicated that with the current number of trains and fluid nature of freight train schedules, there is insufficient track capacity to accommodate commuter/rush hour rail service within the Durham to Raleigh segment of the NCRRC corridor. (This capacity constraint is the reason that a completely separate, double track system will need to be constructed to operate high frequency rail service that could provide full schedule transit service, in keeping with the STAC recommendations.)

In announcing the Shared Corridor Track Expansion Study, NCRRC has indicated that the study is not intended to be a substitute for state, local or regional planning, but to complement NCRRC's planning efforts by assessing the feasibility and additional infrastructure required to operate commuter (rush hour) rail within the freight rail corridor. Findings are anticipated in summer 2008 and will be shared with the region's transportation planning agencies. Additional information about the Shared Corridor Track Expansion Study is included on the NCRRC Web site: <http://www.ncrr.com>

# North Carolina Railroad Company Track Expansion Study Areas

- Burlington to Greensboro
- Goldsboro to Burlington



- North Carolina Railroad Company
- Norfolk Southern
- CSX Transportation
- Short Line Railroads
- Dept. of Defense Military Installations

## **Property Acquisition versus the use Existing Transportation Rights-of-way**

*Why acquire new right-of-way when existing transportation corridors/land, including the medians of I-40 and US-147 could be used? Look at using roadway medians for busways as a low-cost option. What about running BRT down the median of an existing roadway?*

Planning new major transportation investments typically begins with identifying the activity centers that need to be connected and the best ways to accomplish that. Sometimes, with specific technologies or managed (high occupancy vehicle or tolled) lanes, an interstate or roadway median may be ideal. However, where pedestrian access is highly desirable and typically essential for the ultimate success of high frequency transit service, the use of highway medians is not generally appropriate. In the Triangle region, there are major segments of I-40 which no longer have continuous medians.

In the US, high frequency rail transit systems, especially when combined with coordinated development policy, have demonstrated their ability to “focus” and enhance market opportunities for transit oriented development which is compact, mixed use and walkable. For that reason high frequency transit stops and stations need to be located beyond the pedestrian and development constraints of major highway corridors. Any savings on property acquisition that might be accrued using highway medians would be rapidly depleted by the cost of bridges for transit vehicles to get on and off the highway corridor and related improvements.

In some cities the medians of city and suburban streets, (with lower speeds and fewer lanes) have been used to accommodate electrically powered LRT, street cars or trolley cars. Transit passengers cross vehicular travel lanes at roadway intersections to access stations in the median.

Roadway medians may also be used for different types of enhanced bus service. For example, it might be possible to run buses in a guideway (primarily at grade) along the median of portions of a highway like US 70. However, even with sidewalks on both sides of the highway, it would be difficult to create an environment in which pedestrians and bicyclists would feel safe and comfortable adjacent to any 4 to 6 lane, 55 MPH highway similar to US 70. Buses would therefore need to leave the median/guideway at certain intersections and travel to park and ride lots before returning to the guideway.

## **How much time would it take to implement high frequency rail in the Durham to Raleigh Corridor?**

*My recollection is that TTA's initial service was scheduled to commence in 2008 had the federal funding come through in 2005 or 2006. Information developed for the STAC shows that it would take about 7 years to get started in the future. Can we not pick up where we left off?*

In the Regional Transit Vision Plan, the STAC recommended dividing the Durham to Raleigh corridor into three segments: Duke University Medical Center to Triangle Metro Center; Triangle Metro Center (TMC) to NW Cary and NW Cary to Durant Road. The recommendations also identify use of a proposed ½ cent sales tax which would be available in January 2010, or thereafter, as the primary revenue source. Subject to the availability of this funding, it will take about 2½ to 3 years to update and obtain regulatory approvals and complete design work and about 3½ to 4 years to complete construction and initiate service.

There are however, two major unpredictable components of this 6 to 8 year estimate. The Environmental Impact Statement (EIS) completed with the issuance of a Record of Decision (ROD) from FTA in February 2003, covered high frequency DMU service from Duke University Medical

Center to Durant Road. Regardless of the sequence in which the corridor segments are to be implemented, the EIS would have to be updated and approved in its entirety. Since updating the EIS is a public engagement and regulatory process the time that it will actually take is beyond the control of the implementing transit agency and MPOs. The same is true for the review and approval process required by the impacted railroads, which have final approval authority over the design and contents of the construction bid packages.

### **Schedule for Commencement of Commuter (rush hour) Rail Service**

*Is there any estimation of how long it would take to get the commuter train up and running if the current NCRR study shows it's feasible this coming spring?*

A timeframe within which shared track/commuter (rush hour) rail service might be initiated in the NCRR corridor has not been identified. The Shared Corridor Track Expansion Study being undertaken by NCRR is anticipated to be complete by summer 2008. Based on the study scope a schedule for implementation could be developed. Additional information about the Shared Corridor Track Expansion Study is included on the NCRR Web site: <http://www.ncrr.com>

### **Information about the Burlington to Goldsboro and Apex and Wake Forest Corridors**

- *Is there a capital cost (per mile or total) and operating cost estimate for the commuter train between Burlington and Goldsboro and between Apex and Wake Forest? The capital cost of the commuter line could be significantly less than the DMU because of the opportunity to use existing tracks.*

Estimates of the capital and operating costs for commuter rail service between Burlington and Goldsboro and Apex to Wake Forest have not been developed. The types of improvements that will be needed in order to operate the Burlington to Goldsboro service are the subject of the Shared Corridor Track Expansion Study being undertaken by NCRR. Improvements that would be needed for commuter rail between Apex and Wake Forest have not been defined either.

The corridor connecting Burlington, downtown Raleigh and Wake Forest is part of the federally designated South East High Speed Rail (SEHSR) Corridor. The Environmental Impact Statement (EIS) currently underway for the SEHSR project is anticipated to be complete by 2010 after which final design and property acquisition will take place. (More information on the SEHSR project is available at [www.bytrain.org/highspeed](http://www.bytrain.org/highspeed).) Improvements to support SEHSR will include grade separations; at-grade (roadway/rail) crossing closures; new railroad and highway bridges; realignments and other major changes. Any improvements that might be undertaken to support shared track commuter rail operations in these corridor segments would need to be designed in accordance with the SEHSR service and to accommodate high frequency rail service which must operate on tracks which are parallel and separate from those used for commuter or SEHSR.

Because there is much less freight traffic and it is not part of the SEHSR project, the concept of developing a shared track rush hour rail passenger service between Apex and downtown Cary is promising.

The Technology Brief for Commuter Rail that was generated for the STAC earlier this year included a range of \$8 to \$17 million/mile for capital costs. The operating costs for commuter (rush hour) rail are approximately \$440 per hour of revenue service. The following information derived the 2007 FTA New Starts Report may also provide some insight:

- Oceanside-Escondido Rail Corridor, San Diego, CA – 22 miles
  - ◆ 15 stations,(4 located at existing transit centers) in an existing freight corridor \$17.1 million/mile
- Weber County SLC Commuter Rail, Salt Lake City, UT – 43 miles
  - ◆ 8 stations
  - ◆ Some improvements already in place
  - ◆ Right of way already acquired \$15.2 million/mile

■ *Who Controls the Apex to Wake Forest corridor?*

CSX owns the existing track, does the dispatching and CSX owns all or a portion of the rail corridor as follows: CSX owns the corridor between Apex and Downtown Cary (Fetner Junction); CSX and Triangle Transit own parallel segments (Triangle Transit is on the east side) of the corridor between downtown Raleigh and Old Wake Forest Road. CSX owns the entire corridor north of Old Wake Forest Road. NCRRT owns the corridor between downtown Cary and downtown Raleigh.

- *Are there any major hurdles to commuter rail in the Apex to Wake Forest corridor (e.g., track conditions, ownership, etc.) that are not present with the NCRRT commuter rail between Goldsboro and Burlington?*

Improvements would have to be made in all three segments of this in order to accommodate commuter (rush hour) rail service. As previously described, substantial portions of the CSX corridor north of downtown Raleigh will be rebuilt to meet the requirements of SEHSR service. (Improvements between downtown Raleigh and Old Wake Forest Road that would accommodate both SEHSR and high frequency rail service have already been defined.) Unlike the NCRRT corridor, freight traffic in the CSX portions of the corridor (Apex to Cary and Downtown Raleigh to Wake Forest) is lighter. Amtrak passenger rail is limited to the Apex to Cary portion.

The NCRRT portion of this corridor, from downtown Raleigh to Cary, which is much more heavily used by freight and Amtrak passenger rail service, has been substantially upgraded to improve safety, travel times, communications, etc. The degree to which this corridor would have to be improved to support commuter / rush hour rail will be determined by the NCRRT Shared Corridor Track Expansion Study. Also, in downtown Raleigh, the SEHSR corridor transitions from the CSX to the NCRRT corridor as it continues on to Charlotte, NC. Corridor improvements that would support commuter / rush hour rail would have to be compatible with SEHSR. If high frequency rail were to be implemented in this segment of the NCRRT corridor, it would operate on separate tracks, from both SEHSR and commuter rail, therefore conflicts could be minimal.

- *Can commuter (rush hour) rail be pursued in both the Burlington to Goldsboro and Apex to Wake Forest corridors in the short-term?*

Subject to funding and agreements with all parties, it is possible. However, disruption to freight service is a major consideration and construction phasing will have to be carefully planned to avoid operational disruptions. The responsibility of dispatching commuter (rush hour) rail service in this corridor is likely to remain with the railroads. Agreements would have to be reached with all parties ensure that reliable commuter rail schedules could be maintained.

- *I understand that Capital Boulevard would not accommodate BRT or other improvements for rubber tire transit, making the rail corridor more attractive. This would seem to favor commuter rail (rush hour) or high frequency (DMU) rail service (in the downtown Raleigh to Wake Forest corridor) even if we did recommend in favor of curb guided buses between Raleigh and Durham.*

*Is there any reason it would not make sense to have rail between Raleigh and Wake Forest regardless of the transit mode used between Raleigh and Durham?*

If the Raleigh to Durham segment utilized a different technology than the high frequency (DMU) rail concept in the Raleigh to Wake Forest corridor, it would mean that a transfer would be required in downtown Raleigh. Since the rail service would terminate in downtown Raleigh, a maintenance facility would have to be built that had no direct access to any alignment other than the Raleigh to Wake Forest corridor.

- *Would the improvements required for the Burlington to Goldsboro commuter line be wasted if the region ends up pursuing high frequency DMU between Raleigh and Durham? Or could this mean that we could have an express (commuter) line and local (high frequency) line*

Generally speaking, because the shared track/commuter (rush hour) rail and high frequency rail service have been established (by agreement) as completely separate railroads and operating systems, on opposite side of the rail corridor, recoverable costs would be limited. If major improvements such as earthwork, grade separations, utility relocations and drainage networks were built (completely or in part) to support both shared track/commuter rail and high frequency rail, these early investments might result some savings.

Therefore, although the option of transitioning from commuter rail to high frequency rail has not been studied in detail, the answer is dependent on how much compatibility is designed into the system in advance. Just adding or increasing commuter (rush hour) rail service in an active freight rail corridor could involve sharing of existing tracks as long as freight activities and commuter rail activities can take place during different “time windows”, thereby maintaining freight schedules and capacity. However, the assumptions being used for the Shared Corridor Track Expansion Study being undertaken by NCR, suggest that commuter rail service could not be operated within this segment of NCR without improvements that would increase capacity and other key operational factors.

Negotiated agreements with NCR and the railroads also establish that high frequency (DMU) rail service and freight rail operations may only operate on opposite sides of the rail corridor, cannot cross each other at grade and must maintain a minimum separation of 26 feet. This would allow the high frequency rail service to be constructed while freight operations continue, with very limited disruption of freight service being anticipated. Construction costs could be significantly higher for a shared track project that had direct impacts on freight operations.

### **Issues related to the Raleigh-Durham Corridor**

- *Would it be feasible to use the NCR right-of-way between the RBC/Fairgrounds and Downtown Raleigh for curb-guided buses?*

Buses, whether curb-guided or not, are not considered FRA-compliant transit vehicles, and therefore cannot be operated in the Raleigh to Durham NCR corridor. Citing safety and regulatory issues, at the October 31, 2007 STAC meeting representatives from Norfolk Southern Railroad (NSR) and CSX indicated that they could not support the operation of buses in corridors which they lease, own or operate. NCR has conveyed a similar position on this question. The STAC considered the possibility of using curb-guided buses on dedicated busways to service this corridor at the conceptual level only, as there was insufficient time to develop detailed information on operations and where new transportation corridors could be established (outside the NCR corridor).

- *Can staff provide some analysis of the land use implications of this alignment versus the NCR alignment? It appears that the two alignments are essentially the same except between Metrocenter [Triangle Metro Center] and the RBC/ESA/fairgrounds. The curb guided busway misses downtown Cary but picks up Triangle Factory Shops (which may be redeveloped), the Harrison Avenue interchange (very suburban) and the ESA/RBC (which has several mixed use development projects underway). Are there any clear land use advantages/disadvantages to either alignment in that stretch?*

While the locations of the BRT stations have not been studied in detail, the following list was provided to the STAC during the discussion of potential alignments that could be more closely analyzed within the Durham to Raleigh corridor:

High Frequency (DMU) Rail Service Stations	Bus Rapid Transit (BRT) Stations
<ul style="list-style-type: none"> <li>▪ Duke; 9<sup>th</sup> Street, Downtown Durham; Alston Avenue/NCCU</li> </ul>	<ul style="list-style-type: none"> <li>▪ Duke; 9<sup>th</sup> Street, Downtown Durham; Durham Technical Community College;</li> </ul>
<ul style="list-style-type: none"> <li>▪ North RTP; Triangle Metro Center (connection to RDU)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Glaxo; IBM; Triangle Metro Center</li> </ul>
<ul style="list-style-type: none"> <li>▪ NW Cary; Downtown Cary</li> </ul>	<ul style="list-style-type: none"> <li>▪ Factory Shops/Outlet Mall; (connection to RDU); SAS</li> </ul>
<ul style="list-style-type: none"> <li>▪ West Raleigh, Fairgrounds, NCSU, Downtown Raleigh; Government Center</li> </ul>	<ul style="list-style-type: none"> <li>▪ RBC Center; NCSU College of Veterinary Med; NCSU Centennial Campus; Downtown Raleigh; Government Center</li> </ul>

Beginning in 1997, state and local governments, institutions and major employers within the region participated in the selection of stations along the alignment of the high frequency (DMU) rail project corridor. These sites were specifically identified because they present existing market opportunities that already include or could sustain higher density transit supportive development that would be enhanced by rail transit access. Most of them also include developable land and are not constrained by major barriers. Durham, Cary and Raleigh have adopted these station locations and implemented planning and development initiatives that facilitate transit supportive development in many of the station areas. Because these sites represent current market opportunities and offered the prospect of having the enhanced access of rail transit, higher density development and plans for future transit oriented development have already begun to emerge.

Station areas that are constrained by the presence of major highways (within about ½ to ¾ mile); or are located in areas where infill development is unlikely because of development regulations or ownership, are not usually able to sustain transit supportive development. In the absence of opportunities for both higher density development and a pedestrian-friendly environment, transit ridership is unlikely to increase over time. Also, the increased property tax revenues that might have been used to leverage funds for infrastructure improvements including transit may not be realized.



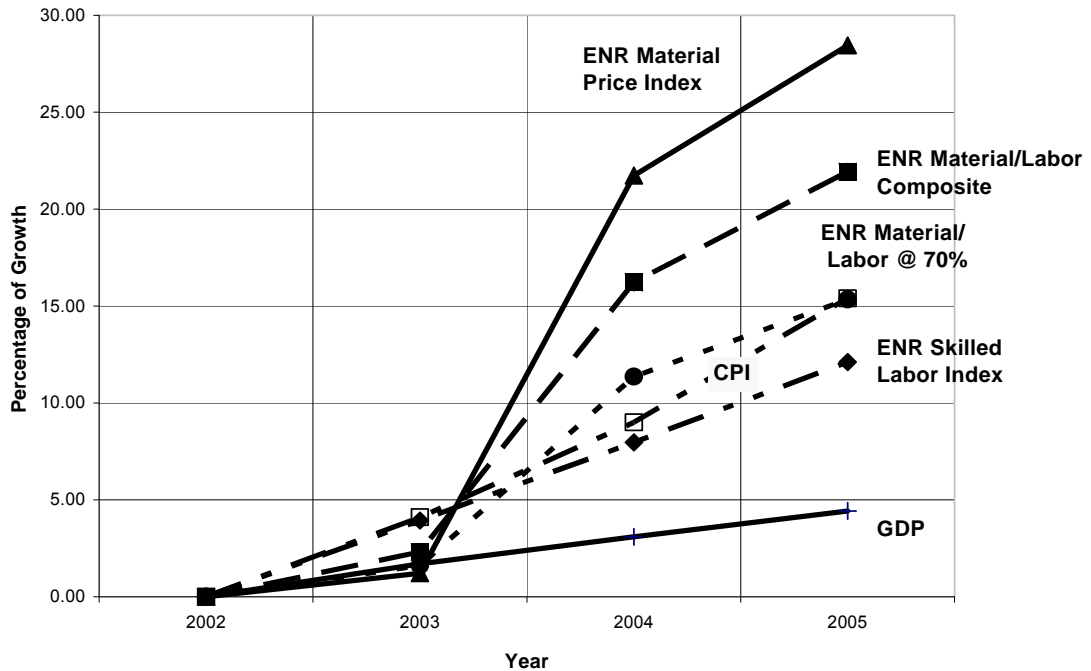
## Transportation Costs

How do the costs of building and operating highways and transit compare?

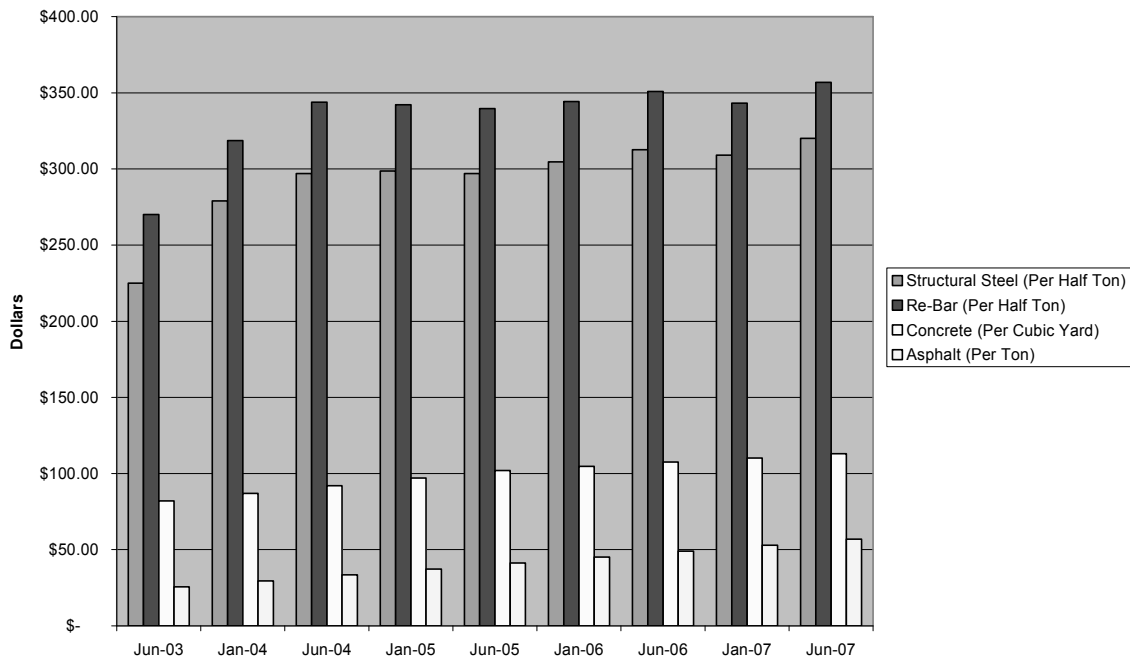
### Cost of Construction Materials

#### Growth in Construction Costs relative to GDP and CPI

APTA COST TRENDS 2002 - 2005  
Cumulative Inflation Comparison  
Data from Engineering News Record(ENR)



#### Changes in Steel, Concrete and Asphalt Costs: 2003 to 2007



Data sources: North American Steel Price Index; Ready-Mix Concrete and RS Means Cost Database

■ **Highway and Transit Development Costs**

The following is an example of the cost of a 6-Lane Freeway similar to US 64/264.

Assumptions:

- 6 Lane Freeway Similar to US 64/264
- 20.6 Miles with 12 Grade Separations
- 12 Interchanges
- Costs exclude right-of-way acquisition

ITEM DESCRIPTION	Base Cost (2007 \$)	Contingency (2007 \$)	Total Estimated Costs (2007 \$)
Freeway 6 Lane Shoulder Section w/ Median - (20.6 Miles)	231,777,200	2,280,000	234,057,200
Grade Separations - (12 Each)	32,634,000	555,000	33,189,000
Freeway to Freeway Interchanges (2-1/2 Each)	288,750,000	25,200,000	313,950,000
Half Clover plus 2 Ramps Interchanges (4 Each)	81,792,000	4,320,000	86,112,000
Diamond Interchanges (4-1/2 Each)	45,635,250	2,130,000	47,765,250
Cost of Right of Way <i>not included</i>			
<b>Totals</b>	<b>\$ 680,588,450</b>	<b>\$ 34,485,000</b>	<b>\$715,073,450</b>

**Total Estimated Cost Per Mile for a 6-lane freeway           \$ 34,712,303**  
**\*Total Estimated Cost Per Mile for a 2 -lane freeway           \$ 28,433,303**

\* *This number has been developed for the purpose of comparing freeway and rail transit capacity and relative costs, recognizing that newly constructed freeways are typically 4-lane (2 lanes in each direction).*

Depending on the design criteria, freeway lanes may carry 1,000 to 1,300 vehicles per hour per lane:

- Average cost per mile for DMU: \$32.6 Million \*\* (double track; Duke to Durant Rd)
- Average cost per mile for LRT: \$46.0 Million \*\* (double track, Chapel Hill to Durham)

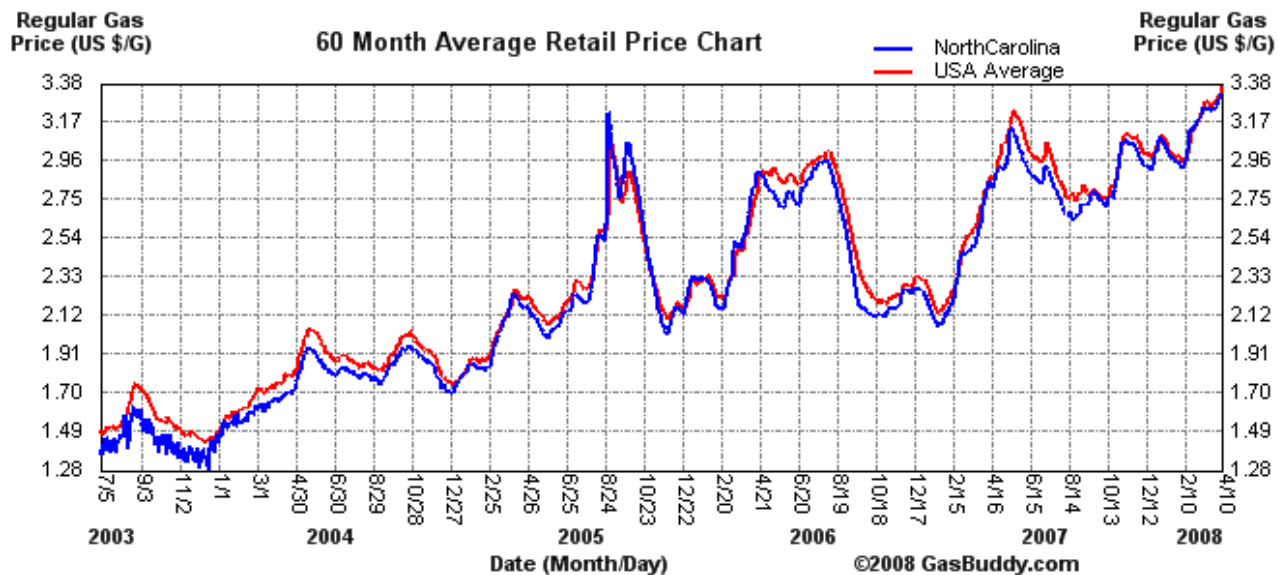
*\*\* Estimated costs reflect \$2007 and may not include all of the improvements that would eventually be implemented in these projects.*

The following applies to both LRT and DMU rail transit:

- Capital costs include vehicles, vehicle maintenance and storage facilities, stations, (including lighting, communications, passenger amenities, etc.) parking lots with bus drop off/pick up areas and other project elements that would not be included in highway construction
- LRT and DMU rail transit are assumed to be operating at 10 minute peak hour frequencies; 20 minutes off-peak and on weekends
- Train units are designed to carry an average of 73 seated passengers or a combined total of 150 seated and standing passengers
- Capacity of single train units traveling in both directions = 300 x 6 trains per peak/hour = capacity for 1800 passengers per peak hour of service
- Typical expansion capacity = three train units = 5,400 passengers per peak hour of service
- Because transit passengers will get on and off the train throughout the route, many more people will be able to use the transit system on an hourly basis.

- **Cost of Fuel**

Data Source: 2008 GasBuddy.com



<http://www.aaaexchange.com/Assets/Files/20073261133460.YourDrivingCosts2007.pdf>

- **Cost of Congestion**

*By The Numbers* (Texas Transportation Institute)

- 35 hours: Annual delay per driver from rush-hour congestion in the Raleigh-Durham area in 2005
- \$671: Annual cost per traveler of rush-hour congestion in the Raleigh-Durham area in 2005
- 11.7 M: Excess gallons of fuel consumed in congested vs. free-flow conditions in Raleigh-Durham area in 2005
- 4.8 M: Excess gallons of fuel consumed in congested vs. free-flow conditions in Raleigh-Durham area in 2005

From: The News & Observer quoted Triangle area statistics from a recent Texas Transportation Institute study.

- **Energy Use and Public Transportation**

The American Public Transportation Association (APTA) recently published the pamphlet “Energy Use and Public Transportation” which noted:

The increasing cost of fuel makes driving private vehicles even more prohibitive for many. Public transportation households save an average of **\$6,251** every year—even more as the price of fuel rises. A single person, commuting alone by car, who switches a 20-mile round trip commute to existing public transportation, can reduce his or her annual CO2 emissions by 4,800 pounds per year, equal to a 10% reduction in all greenhouse gases produced by a typical two-adult, two-car household. By eliminating one car and taking public transportation instead of driving, a savings of up to 30% of carbon dioxide emissions can be realized.

The “leverage effect” of public transportation, supporting transportation efficient land use patterns, saves 4.2 billion gallons of gasoline – more than **three times** the amount of gasoline refined from the oil we import from Kuwait.

## 2008 Driving Costs for North Carolina

	Small Sedan	Medium Sedan	Large Sedan	Car Average	SUVs	Minivan
COST OF CAR	\$17,935	\$21,250	\$26,700	\$21,961	\$28,126	\$26,230
AVERAGE MPG	36	31	25	30.6	21	23
Cost per gallon*	\$3.5950	\$3.5950	\$3.5950	\$3.5950	\$3.5950	\$3.5950
MILES PER YEAR	10,000	10,000	10,000	10,000	10,000	10,000
<b>OPERATING COSTS</b>						
Gas	\$0.0999	\$0.1160	\$0.1438	\$0.1175	\$0.1712	\$0.1563
Maintenance	\$0.0398	\$0.0467	\$0.0507	\$0.0457	\$0.0547	\$0.0476
Tires	\$0.0055	\$0.0085	\$0.0077	\$0.0072	\$0.0093	\$0.0067
<b>TOTAL OPERATING COST PER YEAR</b>	<b>\$2,177.42</b>	<b>\$2,567.52</b>	<b>\$3,033.00</b>	<b>\$2,555.75</b>	<b>\$3,527.86</b>	<b>\$3,159.07</b>
<b>TOTAL OPERATING COSTS PER MILE (rounded to nearest cent)</b>	<b>\$0.15</b>	<b>\$0.17</b>	<b>\$0.20</b>	<b>\$0.17</b>	<b>\$0.24</b>	<b>\$0.21</b>
<b>OWNERSHIP COSTS</b>						
Full-coverage Insurance**	\$815.00	\$874.00	\$846.00	\$845.00	\$814.00	\$710.00
License, Registration	\$68.00	\$68.00	\$68.00	\$68.00	\$68.00	\$68.00
First-year sales and property taxes ***	\$660.15	\$782.17	\$982.77	\$808.37	\$1,035.26	\$965.47
Depreciation (15,000 miles annually) +	\$3,228.30	\$3,825.00	\$4,806.00	\$3,952.98	\$5,062.68	\$4,721.40
Finance Charges++	\$968.49	\$1,147.50	\$1,441.80	\$1,185.89	\$1,518.80	\$1,416.42
<b>TOTAL OWNERSHIP COST PER YEAR</b>	<b>\$5,739.94</b>	<b>\$6,696.67</b>	<b>\$8,144.57</b>	<b>\$6,860.24</b>	<b>\$8,498.75</b>	<b>\$7,881.29</b>
<b>TOTAL OWNERSHIP COST PER MILE (rounded to nearest cent)</b>	<b>\$0.57</b>	<b>\$0.67</b>	<b>\$0.81</b>	<b>\$0.69</b>	<b>\$0.85</b>	<b>\$0.79</b>
<b>TOTAL COST PER MILE</b>	<b>\$0.72</b>	<b>\$0.84</b>	<b>\$1.02</b>	<b>\$0.86</b>	<b>\$1.09</b>	<b>\$1.00</b>
<b>TOTAL COST PER YEAR</b>	<b>\$10,787.33</b>	<b>\$12,612.52</b>	<b>\$15,249.86</b>	<b>\$12,846.11</b>	<b>\$16,275.98</b>	<b>\$14,981.01</b>

\*Price based on April 29, 2008 average NC gas price for a gallon of unleaded self-serve fuel.

\*\*Based on full-coverage policy, \$100,000/\$300,000 coverage with \$500 collision deductible and \$100 comprehensive.

\*\*\*NC sales tax at 3%, NC property tax estimated at .6808/\$100

+Depreciation based on 18 percent per year

++Finance charges for 1 year based on 6% for 60 months after 10% cash down

Charlotte NC, April 29, 2008

Press Release from AAA Carolinas

*North Carolina Driving Costs 63 Cents A Mile in 2008; Cost Will Go Up With Increase in Gas Prices*

*An affiliate of the American Automobile Association, AAA Carolinas was founded in 1922 as a not-for-profit organization that now serves more than 1.7 million members with travel, automobile and insurance services while being an advocate for the safety and security of travelers.*

<http://www.aaacarolinas.com/Media/Releases/index.htm>



# Serving Long Haul Commuters

*A Service Concept Brief*

## Service Concept Basic Description

The **Serving Long Haul Commuters** Service Concept:

- Is focused on carrying passengers during the work week from outlying towns and residential districts into major employment centers such as downtowns, central business districts, college campuses and hospitals
- Service is provided on a regular interval, but not at high frequency. Vehicles are often very full in one direction, but lightly used in the other, particularly during peak hours
- Targets work trips and provides an alternative to driving in corridors where congestion and motorist frustration are high.



Photo Credit: Dallas Area Rapid Transit

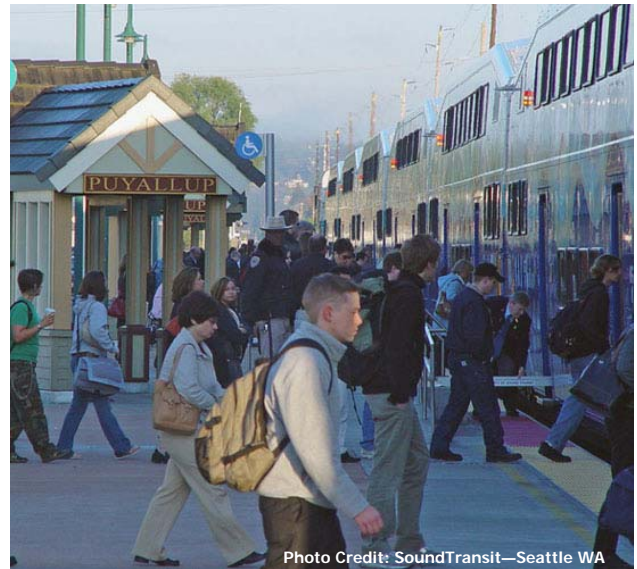


Photo Credit: SoundTransit—Seattle WA

## Operating Characteristics

- Hours of Day: Morning and afternoon rush hour  
 Limited or no midday service
- Days of Week: Weekdays only  
 No weekend or holiday service
- Rush Hour Service Frequency: once every 20 to 60 minutes
- Midday/Evening Service Frequency: once every 15 to 20 minutes, or more often

## Technologies Best Suited for This Concept:

- Commuter Rail
- Diesel Multiple Unit (DMU) rail transit
- High-Level Bus Priority Strategies such as Busways and High Occupancy Toll (HOT) Lanes
- Express Bus

## Mixing Service Concepts:

A single transit investment can provide mobility using more than one service concept.

For example, a long transit line from the suburbs to downtown could stop once every four to six miles at the farthest-from downtown locations, following the **Serving Long Haul Commuters** concept. In neighborhoods closer to downtown, the service could stop every one to two miles, with additional, more frequent service on the near-downtown segments, following the **Connecting Transit-Friendly Neighborhoods** concept.

## Typical Station Attributes:

- Large Park and Ride areas; hundreds of spaces
- Shelters for patrons who may wait longer due to service frequency or are awaiting a ride home
- Station areas often located near major highway or road intersections to attract Park and Ride customers



Photo Credit: Virginia DOT



## Circulating In Town

*A Service Concept Brief*

### Service Concept Basic Description

The **Circulating In Town** Service Concept:

- Is focused on moving large passenger volumes through intense-use districts for “short hop” trips. Downtowns, central business districts, college campuses, or dense urban neighborhoods are well-served by this concept.
- Often provides service so frequently that customers do not need to consult a schedule
- Is often used in an environment where transit vehicles mix with cars and trucks on city streets for at least part of the route.



Photo Credit: Reconnecting America



Photo by: Town of Chapel Hill, NC

### Operating Characteristics

Hours of Day: 5:00 AM to Midnight or later

Days of Week: 365 days/year

Rush Hour Service Frequency: once every 10 minutes, or more often

Midday/Evening/Weekend Service Frequency: once every 15-20 minutes, or more often

### Technologies Best Suited for This Concept:

- Local Bus
- Streetcar
- Bus Rapid Transit
- Light Rail
- Subway/Metro

### Mixing Service Concepts:

A single transit investment can provide mobility using more than one service concept.

For example, a transit line from the suburbs to downtown could stop once every mile or two in suburban locations to follow the **Connecting Transit-Friendly Neighborhoods** service concept. Once entering a downtown business district, the service could stop much more frequently, perhaps once every ¼-mile, following the **Circulating in Town** service concept.

### Typical Station Attributes:

- Station areas fully integrated with sidewalk/urban walking environment
- No Park and Ride spaces
- Limited seating due to short waits for service



Portland MAX— Photo by Peter Ehrlich@nycsubway.org



# Connecting Transit-Friendly Neighborhoods

A Service Concept Brief

## Service Concept Basic Description

The **Connecting Transit-Friendly Neighborhoods** Service Concept:

- Allows people living in transit oriented neighborhoods and districts to use transit for most trips, not just work trips. High levels of service make transit a choice for trips to shopping, recreation and entertainment.
- Works best when supported by land use policies that enable denser mixed use development and lower parking requirements, especially in suburban areas.
- Neighborhoods include 2-way, grid street networks, short blocks with houses close to shaded sidewalks, on-street parking and other features.
- Can link various types of Transit Oriented Development including downtowns, suburban employment centers, universities, residential and mixed-use neighborhoods.



Photo Credit: Reconnecting America

## Technologies Best Suited for This Concept:

- Bus Rapid Transit
- Light Rail
- Diesel Multiple Units (DMU) rail transit

## Mixing Service Concepts:

A single transit investment can provide mobility using more than one service concept.

For example, a transit line from the suburbs to downtown could stop once every mile or two in suburban locations to follow the **Connecting Transit-Friendly Neighborhoods** service concept. Once entering a downtown business district, the service could stop much more frequently, perhaps once every ¼ mile, following the **Circulating in Town** service concept.



Denver CO - Photo by Triangle Transit

## Operating Characteristics

Hours of Day: 6:00 AM to Midnight

Days of Week: 365 days/year

Rush Hour Service Frequency: once every 15 minutes, or more often

Midday/Evening/Weekend Service Frequency: once every 15 - 30 minutes, or more often

## Typical Station Attributes:

- Walkable access within station areas and surrounding neighborhoods
- May or may not have Park and Ride spaces
- Shelters for year-round, all-weather use
- Bicycle parking facilities



Photo Credit: Dallas Area Rapid Transit



# Conventional Express Bus

*A Technology Brief*

## Description

Conventional Express Bus:

- Operates on highways and turnpikes with few stops, offering faster trips than local buses
- Does not have roadway improvements that would provide higher travel speeds than adjacent traffic
- Cannot be implemented in active railroad rights-of-way
- Can use a range of vehicles including typical transit buses, specially designed modern buses and elongated flexible (articulated) buses



Photo by Triangle Transit

## Typical Service Characteristics

Service Distance: 10 to 30 miles

Station spacing: 2 to 10 miles

Service frequency: 5 -15 minutes peak  
15 - 60 minutes off-peak

Average operating speed: 25 to 45 mph (depending on traffic congestion)

Maximum speed: 60 mph

Vehicle capacity: typical - 35 seated; up to 60 with standing passengers  
articulated - 65 seated; with up to 90 with standing passengers

## Typical Costs

Capital cost of individual buses:

- 35' to 40' Transit Bus: \$277,000 to \$354,000
- Articulated Bus: \$495,000

Operating: \$80 per hour per bus

## Important Notes

1. Based on FTA standards, buses last approximately 12 years. Capital costs for buses must therefore include life cycle replacements.
2. Additional individual buses must be deployed when the overall capacity of each bus has been reached, therefore bus operating costs increase as ridership grows
3. Conventional Express Bus service is usually supported by park and ride facilities which include kiss and ride/drop off areas; parking for vehicles and bicycles; shelters and ticket vending.
4. While not typical, some park and ride lots may also include bus transfer options.

## Land Use and Conventional Express Bus Service

Conventional Express Bus stops include park and ride lots, shelters and other passenger amenities. This service will provide commuters with free time and less costly trips but does not avoid highway congestion. Highway capacity is enhanced when commuters park and ride, however weekday transit service with low off-peak frequencies does not appear to induce transit oriented development.



Photo courtesy of Los Angeles County Metropolitan Transportation Authority





## Low-Level Bus Priority Strategies

A Technology Brief

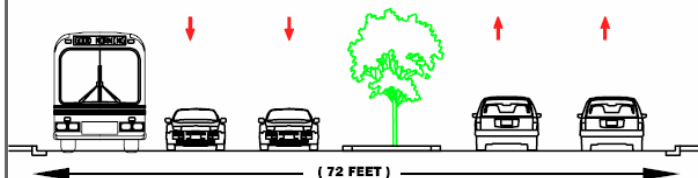
### Description

Low-Level Bus Priority Strategies:

- Help buses maintain travel speeds or travel time reliability through congested areas; because buses stop at several destinations, travel times are not usually time-competitive with automobiles making fewer stops
- Can include short segments of dedicated lanes on streets with car traffic, or intersection treatments such as traffic signal priority and “queue jumping” lanes that give buses an advantage at traffic choke points
- Cannot be implemented in active railroad rights-of-way
- Can use a range of vehicles including typical transit buses, specially designed modern buses and elongated flexible (articulated) buses.



### Typical Cross Section



Typical at-grade cross section where Bus lane or Bypass Shoulder is 72 feet, with 2 auto lanes in each direction and a center median or turn lane

### Typical Service Characteristics

- Service Distance: ½ to 5 miles  
Stop spacing: ¼ to ½ miles  
Service frequency: 15 minutes peak  
30 - 60 minutes off peak  
Average operating speed: 25 - 45 mph  
Maximum speed: 60 mph  
Vehicle capacity: typical - 35 seated; up to 60 with standing passengers  
articulated - 65 seated; with up to 90 with standing passengers

### Typical Costs

Capital: \$150,000 - \$500,000 per mile  
(Exact costs are contingent on bus priority signalization technology, bus lane upgrades, and other site specific design considerations)

Operating: \$80 per hour per bus

### Important Notes

1. While Low-Level Bus Priority Strategies do not usually require more right-of-way, costs will vary depending on the location of the corridor, availability of and cost to use existing rights-of-way, and whether private land has been reserved or dedicated for widened right-of-way.
2. Based on FTA standards, buses last approximately 12 years. Capital costs for buses must therefore include life cycle replacements.
3. Additional individual buses must be deployed when the overall capacity of each bus has been reached, therefore bus operating costs increase as ridership grows
4. Bus priority strategies share some characteristics of streetcar service, such as signal priority.

### Land Use and Low Level Bus Priority Strategies

Low-Level Bus Priority Strategies raise the speed and reliability of existing, mostly conventional local or express bus service and provide commuters with free time and less costly trips. Highway capacity is enhanced when commuters park and ride, however weekday transit service with low off-peak frequencies does not appear to induce transit oriented development.



# High-Level Bus Priority Strategies

*A Technology Brief*

## Description

High-Level Bus Priority Strategies:

- Help buses maintain travel speeds and travel time and sometimes a travel time advantage over automobiles by providing high-quality facilities such as High Occupancy Vehicle (HOV) or High Occupancy Toll (HOT) lanes, limited to buses and other select vehicles
- Provide priority or reliable high-speed running for buses over extended segments of roadway, sometimes for several miles
- Cannot be implemented in active railroad rights-of-way
- Can use a range of vehicles including typical transit buses, specially designed modern buses and elongated flexible (articulated) buses



Photo Courtesy: City of Charlotte

## Typical Service Characteristics

Service Distance: 5 to 20 miles

Station spacing: End stations only

Service frequency: 10 - 15 minutes peak  
 20 - 60 minutes off peak

Average operating speed: 35 to 55 mph

Maximum speed: 60 mph

Vehicle capacity: typical - 35 seated; up to 60 with standing passengers  
 articulated - 65 seated; with up to 90 with standing passengers

## Typical Costs

Capital: \$4 – \$13 million per mile  
 (Exact costs contingent upon environmental constraints, bus priority signalization and other technologies, land/right-of-way costs, topography and other site specific considerations)

Operating: \$80 per hour per bus

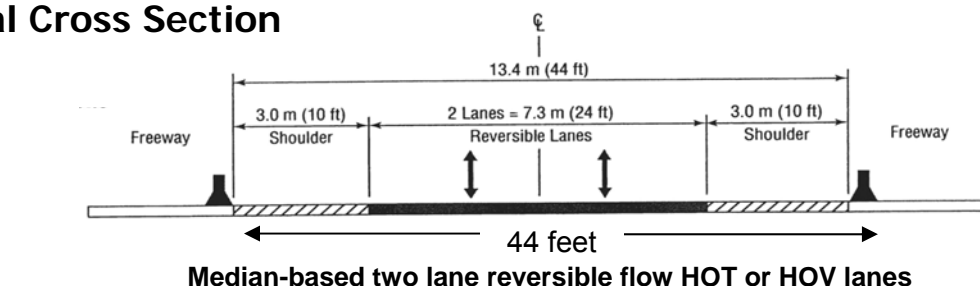
## Important Notes

1. Right-of-way costs will vary depending on the location of the corridor, availability of and cost to use existing rights-of-way, and whether private land has been reserved or dedicated for widened right-of-way.
2. Based on FTA standards, buses last approximately 12 years. Capital costs for buses must therefore include life cycle replacements.
3. Additional individual buses must be deployed when the overall capacity of each bus has been reached, therefore bus operating costs increase as ridership grows.
4. Service characteristics are dependent on the type of roadway, including the number and spacing of stops and signals. Bus priority service may be similar to streetcar service in its characteristics.

## Land Use and Bus Priority Service

High Level Bus Priority Strategies raise the speed and reliability of bus service, making it time-competitive with automobiles in congested corridors and provide commuters with shorter, less costly trips without the constraints of driving. Highway capacity is enhanced when commuters park and ride, however weekday transit service with low off-peak frequencies does not appear to induce transit oriented development.

## Typical Cross Section





## Bus Rapid Transit (BRT)

A Technology Brief

### Description

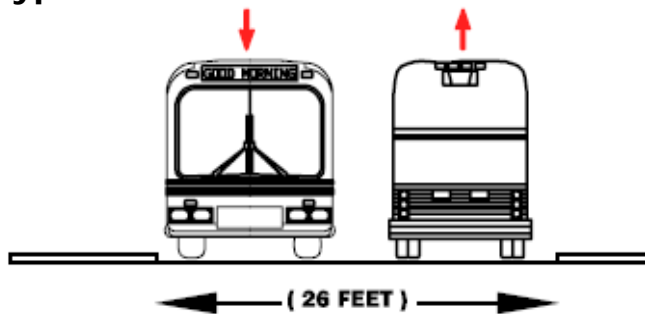
Bus Rapid Transit:

- Can operate in a separate guideway (transitway) or on streets in dedicated lanes (not mixed with other traffic)
- Cannot be implemented in railroad rights-of-way with freight operations
- Can use a range of vehicles including typical transit buses, specially designed modern buses and elongated flexible (articulated) buses
- Curb Guided BRT operates within separate guideways using retractable horizontal guidewheels which allow buses to operate at higher speeds in narrower lanes, as well as on-street, where the driver resumes control



Quito, Ecuador—Photo by Steve Gaddis

### Typical Cross Section



Typical at-grade cross section required is 26 feet. Wider sections at stations or where passing lanes needed.

### Typical Service Characteristics

Service Distance: 5 to 20 miles  
Station spacing: ¼ to 2 miles  
Service frequency: 5-15 minutes peak  
10-20 minutes off peak  
Average operating speed: 35 to 55 mph  
Maximum speed: 60 mph  
Vehicle capacity: typical - 35 seated; up to 60 with standing passengers  
articulated - 65 seated; with up to 90 with standing passengers

### Typical Costs

Capital: \$16 – \$40 million per mile (dual lanes)  
(Exact costs contingent on environmental constraints, number of stations at and above grade, land/right-of-way costs, topography and other site specific considerations)

Operating: \$80 per hour per bus

### Important Notes

1. Funding for right-of way will vary depending on the location of the corridor; availability of and cost to use existing, dedicated or reserved rights-of-way, or the need to acquire new property for the BRT transitway.
2. The term “bus rapid transit” (BRT) is applied to a wide range of service quality: from buses in completely separate transitways similar to rail transit to “enhanced” bus service supported by “queue-jumping” or bus priority lanes at intersections. This technical brief defines BRT in separate transitways.
3. Curb Guided BRT segments are found in 11 different transit systems located in Germany, Great Britain, Japan and Australia. These guideway segments range from 600 ft to 11 miles long and are typically part of High-Level Bus Priority systems that include other improvements which help maintain bus speeds.

### Land Use and Bus Rapid Transit (BRT)

Comprehensive BRT systems using separate transitways have shown evidence of supporting transit-oriented development in Bogotá, Columbia, Curitiba, Brazil and other countries. To date, BRT systems of similar quality have not been built in the US. There is no conclusive evidence of market forces responding to create transit-oriented development around the low-to-medium level BRT investments currently operating in the US.



# Modern Streetcar

A Technology Brief

## Description

Modern Streetcar:

- Operates on tracks (fixed guideway) on streets in dedicated lanes or lanes mixed with automobile traffic; traffic signal priority at intersections can be used to enhance service frequency
- Cannot be implemented in railroad rights-of-way with freight traffic or long-distance passenger rail
- Vehicles are powered by overhead electrical wires (catenary) and designed to operate as single units that may have flexible or articulated segments



## Typical Service Characteristics

- Service Distance: 5 miles or less  
Station spacing: 1/8 to 1/2 miles  
Service frequency: 5 - 10 minutes peak  
20 - 30 minutes off peak  
Average operating speed: 8 - 15 mph  
Maximum speed: 45 mph  
Vehicle Capacity: 16 - 60 seated; up to 120 with standees

## Typical Costs

Capital: \$25 - \$37 million per mile (double track)  
(Exact costs contingent on environmental constraints, operating agreements, number of stops, land/right-of-way costs, topography and other site specific design considerations.)

Operating: \$230 per hour per streetcar for standard or articulated streetcars service.

## Land Use and Modern Streetcars

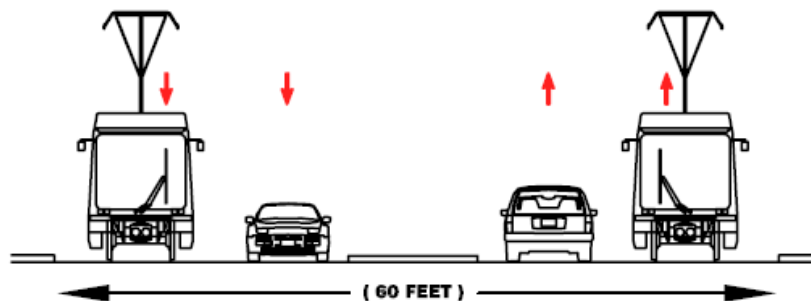
Modern Streetcar service can facilitate transit-oriented development. Streetcars are well suited for frequent stops in dense compact urban environments and, with its permanent tracks and power system may sometimes be considered more desirable than typical bus technology applications.

The 2-mile Charlotte Trolley line that preceded their LRT has been credited with fostering transit ridership and early compact, mixed-use, walkable development.

## Important Notes

1. Funding for right-of way costs will vary greatly, depending on the location of the corridor; the availability of and cost to use existing rights-of-way, and whether private land has been reserved or dedicated for widened right-of-way.
2. Service characteristics are highly dependent on the nature of the roadway traversed, including the number and spacing of stops and signals.
3. Stops may include shelters on sidewalk.

## Typical Cross Section



Typical at-grade cross section where separate lane used is 60 feet for a road with one auto lane in each direction and leaves room for a center median or turn lane.



## Light Rail Transit (LRT)

A Technology Brief

### Description

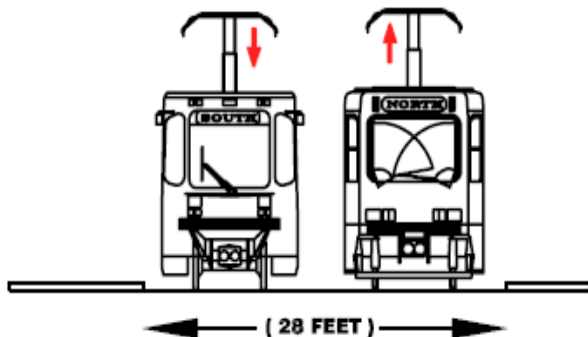
Light Rail Transit:

- Operates on tracks (fixed guideway) that can be in an exclusive corridor or dedicated lanes on streets
- May be operated in corridors with freight railroads by complying with Federal Railroad or Federal Transit Administration regulations; time separation and/or specific distances between freight and LRT will be required
- Vehicles are powered by overhead electrical wires (catenary) and designed to operate as permanently fixed, flexible (articulated) pairs or with up to 6 cars linked together to support peak and off peak passenger loads

### Typical Service Characteristics

Corridor lengths: 5 to 20 miles  
Station spacing: ¼ to 2 miles  
Service frequency: 5 - 15 minutes peak  
10 - 20minutes off peak/weekends  
Average operating speed: 15 - 30 mph  
Maximum speed: 65 mph  
Vehicle capacity: 40 - 60 seated; up to 125 with standees  
articulated pairs - 72 seated; up to 150 with standees

### Typical Cross Section



Typical at-grade cross section requires at least 28 feet of track way. Wider sections are needed at stations and passing tracks.



Photo Credit: Regional Transportation District—Denver

### Typical Costs

Capital: \$25 - \$60 million per mile (double track)  
(Exact costs contingent on environmental constraints, operating agreements, number of stations at, above or below grade, land/right-of-way costs, topography and other site specific design considerations.

Operating: \$230 per hour per train, which may be one rail car or several linked rail cars.

### Important Notes

1. Funding to purchase rights-of way for LRT corridors and land for stations will vary greatly, depending on the corridor and station locations, availability and current uses; options for use of existing rights-of-way; prior reservation or dedication of a corridor, public or private property for transit and other site specific factors.
2. LRTs may operate in roadway medians where transit patrons access the platforms using crosswalks at intersections; in lanes adjacent to one or both sides of the street or in exclusive rights-of-way.
3. Stations may be platforms and shelters in medians; shelters along sidewalks or include bus transfers and park and ride areas

### Land Use and Light Rail Transit (LRT)

LRTs are used to provide high frequency rail transit service. Stations in the urban core are spaced less than a mile apart and farther apart in suburban areas. Market forces respond to high frequency peak, off-peak and weekend LRT service by implementing transit oriented development.



## Diesel Multiple Unit Rail (DMU)

A Technology Brief

### Description

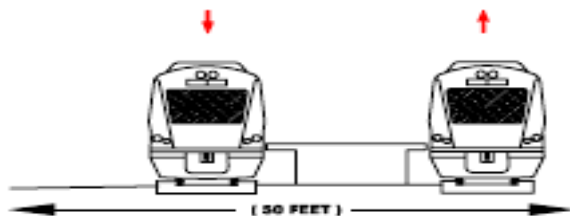
Diesel Multiple Unit Rail:

- Must operate on a fixed guideway completely separated from automobile traffic with signalized at-grade highway/railroad crossings or grade separations
- Can operate in corridors with freight railroads; time or specific distances between freight and DMU tracks may be required or desirable
- Vehicles are self-propelled, may be single or “double decker” and designed to operate as single units, permanently fixed pairs or with up to 6 cars linked together to support peak and off peak passenger loads



Photo Courtesy: City of Ottawa

### Typical Cross Section



Typical at-grade cross section required is 50 feet. Wider sections are needed at stations and for passing track locations

### Typical Service Characteristics

- Service Distance: 20 to 60 miles  
Station spacing: ½/2 to 5 miles  
Service frequency: 10 - 15 minutes peak  
20 - 60 minutes off peak/weekends  
Average operating speed: 25 - 35 mph or faster based on station spacing  
Maximum speed: 80 mph  
Vehicle Capacity: single level - 75 - 90 seated or 138 with standees  
double decker - 188 seated  
standing/crush loading - ±35% more

### Typical Costs

Capital: \$25 - \$40 million per mile (double track)  
(Exact costs contingent on environmental constraints, railroad agreements, number of stations at, above or below grade, land/right-of-way costs, topography and other site specific design considerations.

Operating: \$240 per hour per train which may be one rail car or several linked rail cars.

### Important Notes

1. Funding to purchase or lease right-of way for a rail corridor and land for stations will vary greatly, depending on the corridor location, availability and current uses; options for use of existing rights-of-way; prior reservation or dedication of a corridor, public or private property for transit and other site specific factors.
2. Federal regulations and railroad operating policies impact the use of DMUs in freight railroad corridors; DMUs meeting Federal Railroad Administration standards are typically allowed to operate in freight corridors and may share tracks.
3. Maintaining a least 25 ft between DMU and freight tracks permits independent operation, which is essential for high frequency rail service.

### Land Use and Diesel Multiple Unit Transit (DMU)

DMUs can be used for long-haul rush/peak hour rail service as well as high frequency rail transit. Stations are typically spaced more than 1 mile apart, but may be closer in downtowns. Market forces respond to high frequency peak, off-peak and weekend rail transit service by implementing transit oriented development. When operating in an active railroad corridor greater focus must be placed on pedestrian connectivity.



## Commuter Rail

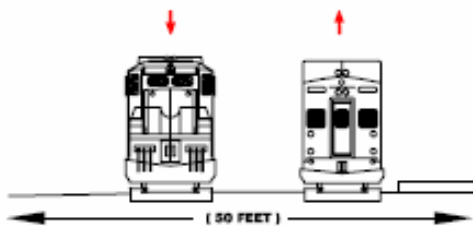
A Technology Brief

### Description

Commuter Rail:

- Must operate on a fixed guideway completely separated from automobile traffic with signalized at-grade highway/railroad crossings or grade separations
- Generally includes locomotive engines pulling multiple push-pull passenger cars that may be single level or double decked
- Can operate in freight railroad corridors and often shares tracks with freight trains

### Typical Cross Section



Typical at-grade cross section required is 50 feet. Wider section required at stations or where passing tracks are needed

### Typical Service Characteristics

Corridor lengths: 20 to 80 miles

Station spacing: 2 to 10 miles

Service frequency: 20 - 60 minutes peak  
60 or more minutes off peak

Average operating speed: 40 to 60 mph

Maximum speed: 79 mph

Vehicle capacity: standard cars - 56 to 88 seated  
bi-Level cars - 124 to 136 seated  
standing/crush loading -  $\pm 35\%$  more



Mountain View, CA Photo by: Triangle Transit

### Typical Costs

Capital: \$8 - \$17 million per mile  
(Exact costs contingent on environmental constraints, railroad agreements, number of stations at, above or below grade, land/right-of-way costs, and other site-specific considerations).

Operating: \$440 per hour, which may be one locomotive and a single or several linked passenger cars.

### Important Notes

1. Lease or purchase costs for use of a rail corridor can vary; whether or not new tracks are required for commuter rail service will affect costs.
2. Shared operations involving the use of freight tracks can impact service frequency, characteristics and quality.
3. Compared to the BRT, LRT and DMU examples, this commuter rail technology brief assumes fewer stations and less frequent service.

### Land Use and Commuter Rail

Service using Commuter Rail is usually less frequent and more likely to be peak hour with longer distances between stations, therefore its influence on station area development does not appear to be as substantial as rail transit service with more stations separated by shorter distances and more frequent service during peak and off peak hours and weekends.

## **Appendix F: Details of Bus Service Expansion**

In 2006, Mayor Meeker of Raleigh and Mayor Bell of Durham asked transit staff from the various Triangle transit agencies to work together on a plan to upgrade the existing bus services throughout the region.

The product of this effort has become known as the Mayors' Bus Plan, a yet-to-be funded framework for Triangle bus service expansion and enhancement over a seven-year period.

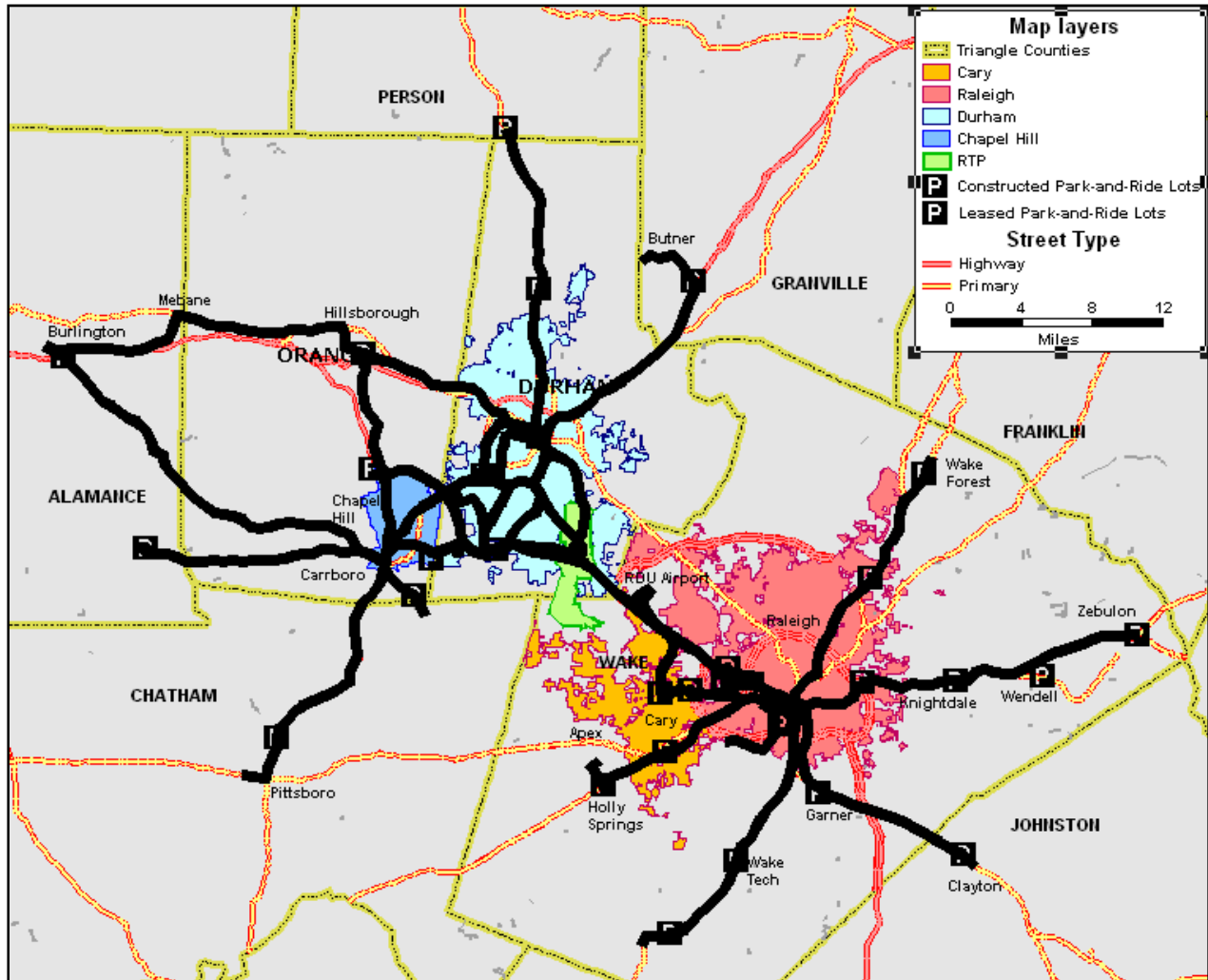
The Mayors' Plan is the most advanced work to date on how bus service could be effectively expanded in the short term in the Triangle. The STAC believes that the Mayor's Plan offers a good starting point to represent the type of service expansion recommended as an initial investment.

Highlights of the Mayors' Plan Include:

- Service to five additional counties beyond Durham/Orange/Wake and eleven additional towns
- Real-time bus arrival information via satellite technology, internet, and phone
- Expanded Sunday Service throughout the region
- Added frequency on existing express routes
- Three local "Go Zones" with high-frequency service in the busiest local corridors
- Signal priority pilot projects to speed buses
- Bus Bypass Shoulder Pilot Project on I-40
- Eighty new buses operating during rush hour



## Routes in the Mayors' Bus Expansion Plan Source: Triangle Transit



## STAC Regionwide Bus Service Proposal: Annual Operating and Maintenance Costs

### Mayors' Plan Service Proposals

Jurisdiction	Nature of Service: Local or Regional?	Projects	Existing Service, Enhanced Service, or New?	Annual Operating Cost (\$2007)	New Buses Needed (Including Spares)	Service Concept
Durham/ Orange	Local/Regional	15-501 Express and local coordination	Enhanced	\$ 200,000	1	Connecting Transit-Friendly Neighborhoods
Durham/ Granville	Regional	Butner/Creedmoor to Durham/Duke	New	\$ 210,000	1	Serving Long-Haul Commuters
Durham	Regional	Durham-Person County Line to Durham/Duke	New	\$ 340,000	2	Serving Long-Haul Commuters
Durham	Local/Regional	South Square - RTP via MLK, Jr Blvd	New	\$ 570,000	3	Connecting Transit-Friendly Neighborhoods
Durham	Regional	Durham - RDU Direct	New	\$ 520,000	3	Serving Long-Haul Commuters
Orange/ Alamance	Regional	Burlington/Graham to UNC/Chapel Hill	New	\$ 420,000	2	Serving Long-Haul Commuters
Orange/ Chatham	Regional	Pittsboro to UNC/Chapel Hill	New	\$ 580,000	3	Serving Long-Haul Commuters
Orange	Regional	Hillsborough to UNC/Chapel Hill	Enhanced	\$ 190,000	1	Serving Long-Haul Commuters
Wake/ Johnston	Regional	Clayton/Garner to Raleigh	New	\$ 810,000	4	Serving Long-Haul Commuters
Wake	Regional	Zebulon to Raleigh	Enhanced	\$ 1,560,000	7	Serving Long-Haul Commuters
Wake	Regional	Wake Tech (extended to Fuquay-Varina) to Raleigh	New	\$ 1,000,000	5	Serving Long-Haul Commuters
Wake	Regional	Wake Forest to Raleigh	New	\$ 1,210,000	6	Connecting Transit-Friendly Neighborhoods
Wake	Regional	Apex/Cary to NCSU/Raleigh	Enhanced	\$ 900,000	4	Serving Long-Haul Commuters
Wake	Regional	RTP to Morrisville to Cary to NCSU/Raleigh (re-route and add mid-day)	Enhanced	\$ 910,000	4	Connecting Transit-Friendly Neighborhoods
Wake	Regional	Raleigh - RDU Direct	New	\$ 520,000	3	Serving Long-Haul Commuters
Wake	Regional	Cary - RDU Direct	New	\$ 750,000	4	Serving Long-Haul Commuters
Wake	Regional	Tryon Rd in Raleigh to NCSU	Enhanced	\$ 750,000	4	Serving Long-Haul Commuters
Wake	Local	Raleigh Hillsborough St Corridor	Enhanced	\$ 310,000	2	Connecting Transit-Friendly Neighborhoods
Wake	Regional	NW Raleigh to Downtown	New	\$ 370,000	2	Serving Long-Haul Commuters
DATA	Local	Southpoint to Duke/Durham via NC 751	New	\$ 620,000	3	Connecting Transit-Friendly Neighborhoods
DATA	Local	New Hope Commons-Southpoint-RTP	New	\$ 390,000	2	Connecting Transit-Friendly Neighborhoods
DATA	Local	Fayetteville St corridor	Enhanced	\$ 180,000	1	Connecting Transit-Friendly Neighborhoods
DATA	Local	DATA Route 6 (add skip stop service from downtown to Duke)	Enhanced	\$ 210,000	1	Circulating In Town
CHT	Local	MLK, Jr. Blvd Corridor	Enhanced	\$ 520,000	3	Circulating In Town
CHT	Regional	Old Greensboro Rd to UNC/Chapel Hill	New	\$ 200,000	1	Serving Long-Haul Commuters
CHT	Local	Mt. Carmel Church Rd to UNC/Chapel Hill	New	\$ 210,000	1	Serving Long-Haul Commuters
CHT	Local	Farrington Rd to UNC	New	\$ 460,000	2	Circulating In Town
TTA	Regional	Durham - Raleigh Express (added trips)	Enhanced	\$ 350,000	2	Serving Long-Haul Commuters
TTA	Regional	Chapel Hill - Raleigh Express (added trips)	Enhanced	\$ 350,000	2	Serving Long-Haul Commuters
TTA	Regional	Sunday Express	New	\$ 580,000	0	Serving Long-Haul Commuters
<b>TOTAL</b>				<b>\$ 16,040,000</b>	<b>79</b>	

### STAC Corridors Not Served by Mayors' Plan

Jurisdiction	Projects	Existing Service, Enhanced Service, or New?	Annual Operating Cost (\$2007)	New Buses Needed (Including Spares)	Service Concept
Wake	Regional	Southern Arc 540 Transit	\$ 940,000.00	6	Serving Long-Haul Commuters
Alamance/Orange/Du	Regional	Burlington to Hillsborough to Duke/Durham	\$ 320,000.00	2	Serving Long-Haul Commuters
Wake/Durham	Regional	Durham to Apex	\$ 1,680,000.00	6	Serving Long-Haul Commuters
Wake/Durham	Regional	US 70	\$ 720,000.00	3	Serving Long-Haul Commuters
Wake	Regional	TMC to Johnston County via I-40	\$ 630,000.00	4	Serving Long-Haul Commuters
<b>TOTAL</b>			<b>\$ 4,270,000.00</b>	<b>21</b>	

**STAC Regionwide Bus Service Proposal: Annual Operating and Maintenance Costs (con't.)**

**STAC Corridors Covered By Existing Services**

Jurisdiction			Projects	Existing Service, Enhanced Service, or New?	Annual Cost (Already Paid for in Existing Triangle Transit Budget)	New Buses Needed (Including Spares)	Service Concept
Wake	Regional		Northern Arc 540 (Triangle Transit Route 201)	Existing	\$ 170,000	0	Serving Long-Haul Commuters
Wake	Regional		NC 55 to RTP (Triangle Transit Route 311)	Existing	\$ 290,000	0	Serving Long-Haul Commuters
<b>Existing Spending Total</b>					<b>\$ 460,000</b>	<b>0</b>	

**Non-STAC Corridors to complete Municipal Coverage**

**New Services**

Jurisdiction			Projects	Existing Service, Enhanced Service, or New?	Annual Cost (\$2007)	New Buses Needed (Including Spares)	Service Concept
Wake	Regional		DT Raleigh to Rolesville	New	\$ 630,000	4	Serving Long-Haul Commuters
Wake	Regional		Wake Forest to Franklinton	New	\$ 410,000	2	Serving Long-Haul Commuters
<b>New Spending Total</b>					<b>\$ 1,030,000</b>	<b>6</b>	

**Circulators**

Jurisdiction			Projects	Existing Service, Enhanced Service, or New?	Annual Operating Cost (\$2007)	New Buses Needed (Including Spares)	Service Concept
Wake	Local		Cary Circulator	Enhanced	\$ 2,650,000.00	7	Circulating In Town
Wake	Local		Raleigh Circulator 1 (DT Raleigh to Crabtree)	Enhanced	\$ 2,650,000.00	7	Circulating In Town
Wake	Local		Raleigh Circulator 2 (DT Raleigh to Wake Med)	Enhanced	\$ 2,650,000.00	7	Circulating In Town
Durham	Local		Durham Circulator	Enhanced	\$ 2,650,000.00	7	Circulating In Town
Orange	Local		Chapel Hill/Carrboro Circulator	Enhanced	\$ 2,650,000.00	7	Circulating In Town
<b>TOTAL</b>					<b>\$ 13,250,000.00</b>	<b>35</b>	

**Additional Available Buses for Local Needs**

Jurisdiction			Projects	Existing Service, Enhanced Service, or New?	Annual Operating Cost (\$2007)	New Buses Needed (Including Spares)	Service Concept
Wake	Local		New/Enhanced Local Service TBD	New/Enhanced	\$ 1,020,000.00	5	Circulating In Town
Durham	Local		New/Enhanced Local Service TBD	New/Enhanced	\$ 610,000.00	3	Circulating In Town
Orange	Local		New/Enhanced Local Service TBD	New/Enhanced	\$ 210,000.00	1	Circulating In Town
<b>TOTAL</b>					<b>\$ 1,830,000.00</b>	<b>9</b>	

					Annual Operating Cost (\$2007)	New Buses Needed (Including Spares)
<b>GRAND TOTAL of BUS SERVICES</b>					<b>\$ 36,420,000.00</b>	<b>150</b>

## Total Number of Buses Funded by STAC Plan, with Accounting for Buses Redeployed After Rail Services Open

Year	Added STAC Buses	Total STAC Buses	Rail Re-Allocation Buses	Total Buses Providing Service that Does Not Exist Today	Total Peak Buses in the Region	Rail Investment
2008	0	0	0	0	263	
2009	0	0	0	0	263	
2010	0	0	0	0	263	
2011	25	25	0	25	288	
2012	20	45	0	45	308	
2013	20	65	0	65	328	
2014	12	77	0	77	340	
2015	9	86	0	86	349	
2016	7	93	0	93	356	
2017	3	96	22	118	381	Buses Redeployed from NW Cary to Durant Rd
2018	3	99	0	121	384	
2019	3	102	4	128	391	
2020	3	105	0	131	394	Buses Redeployed from Duke Medical to Triangle Metro Center
2021	3	108	0	134	397	
2022	3	111	12	149	412	Buses Redeployed from UNC Hospital to Durham Multimodal Center
2023	3	114	0	152	415	
2024	3	117	4	159	422	Buses Redeployed from Triangle Metro Center to NW Cary
2025	3	120	0	162	425	
2026	3	123	0	165	428	
2027	3	126	0	168	431	
2028	3	129	0	171	434	
2029	3	132	0	174	437	
2030	3	135	0	177	440	
2031	3	138	0	180	443	
2032	3	141	0	183	446	
2033	3	144	0	186	449	
2034	3	147	0	189	452	
2035	3	150	0	192	455	

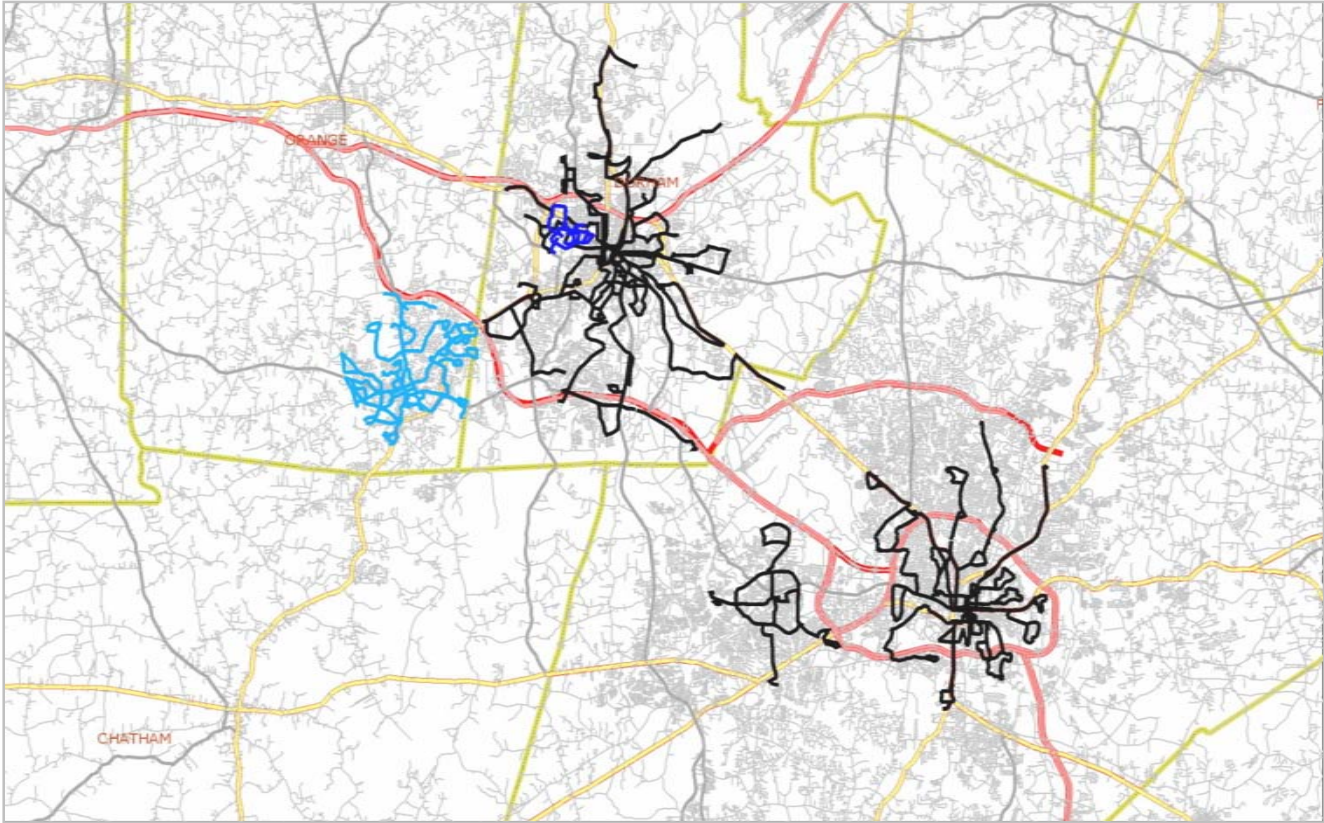
Note: This is one HYPOTHETICAL deployment of rail services. It does not reflect any official prioritization on behalf of the STAC or staff of the MPOs, RTA, Triangle Transit, or ITRE.

**What this table is telling us:**

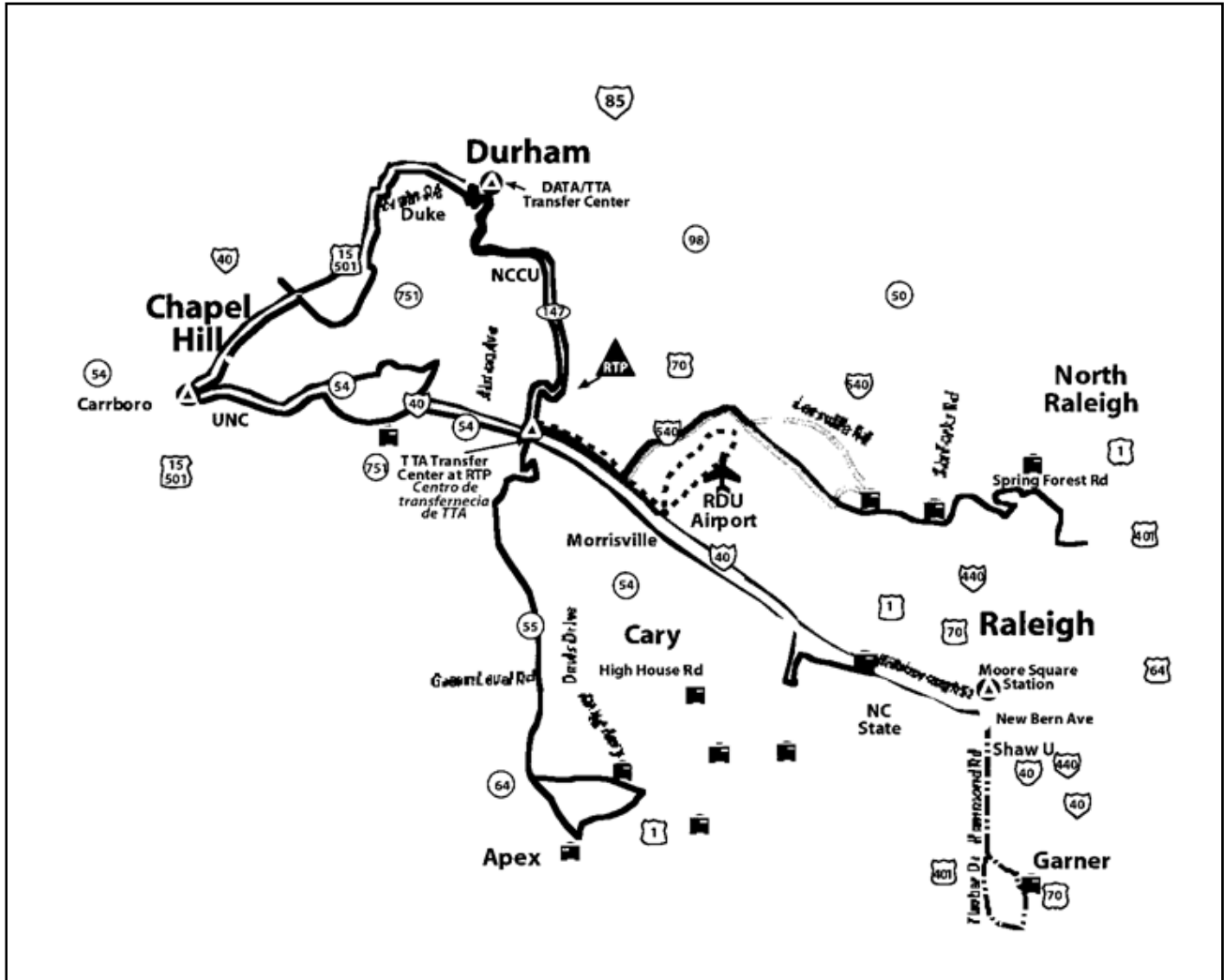
While the STAC plan provides funding for 150 buses across the region and rail investments from North Raleigh to Downtown Raleigh to Cary to RTP to Durham and Chapel Hill, the opening of those rail services provides superior transit in several congested corridors currently served by buses. When various rail segments opened, many buses will be able to change routes to connect outlying destinations to rail stations, or to provide crosstown services or local service enhancements. Staff's best estimate is that when all the rail segments proposed in the STAC plan are open, an additional 42 buses in total will be redeployed.

***In short, the STAC plan pays for 150 new buses, but over the life of the plan, it introduces the service equivalent of 192 new buses.***

**Existing Local Bus Networks**  
**Note: NCSU's Wolfline routes not included.**  
**Source: Triangle Transit**



2006 Regional Bus Network  
Source: Triangle Transit



## Triangle Region Data from National Transit Database, 2006

AGENCY	Total Annual Unlinked Passenger Trips	Total Annual Passenger Miles	Total Annual Revenue Miles	Total Annual Revenue Hours	Average Passenger Trip Length (Miles)	Average Passenger Trips Per Hour	Average Operating Expense Per Passenger Mile	Average Operating Expense Per Revenue Mile	Average Operating Expense Per Revenue Hour	Total Vehicles Operated During Rush Hour	Total Funds Expended on Operations	Total Funds Expended on Capital
Capital Area Transit (Raleigh)	3,937,310	14,666,531	2,116,629	165,178	3.7	23.8	\$0.85	\$5.89	\$75.49	48	\$ 12,469,613	\$ -
Chapel Hill Transit	5,874,247	15,096,815	1,824,976	145,145	2.6	40.5	\$0.64	\$5.25	\$66.03	77	\$ 9,583,346	\$ 4,391,746
Durham Area Transit Authority	4,448,972	18,069,244	2,319,403	166,272	4.1	26.8	\$0.73	\$5.71	\$79.64	37	\$ 13,241,753	\$ 191,569
Triangle Transit	802,570	9,046,653	1,976,007	89,932	11.3	8.9	\$0.93	\$4.26	\$93.46	49	\$ 8,405,306	\$ 757,181
Cary Transit	23,354	NA	160,990	9,946	NA	2.4	NA	\$3.81	\$61.75	5	\$ 614,166	\$ -
NCSU Wolfline	1,769,855	2,374,937	536,619	54,766	1.3	32.3	\$1.51	\$6.69	\$65.60	23	\$ 3,592,924	\$ 81,823

**REGIONWIDE**                      **16,856,308**   **59,254,180**   **8,934,624**   **631,239**                      **3.5**                      **26.7**   **\$ 0.83**   **\$ 5.51**   **\$ 78.02**                      **239**   **\$ 47,907,108**   **\$ 5,422,318**

NA = Not Available

**Terms Explained:**

***Unlinked Passenger Trip*** - One boarding of a bus by a passenger; counting transfers separately. If a passenger boards one CAT bus, then transfers to another CAT bus, this is 2 unlinked trips, or 1 linked trip.

***Passenger Mile*** - The distance traveled by transit passengers, as opposed to transit vehicles. If there are 20 passengers in a bus, and the bus travels 1 mile, this generates 20 passenger-miles of movement.

***Revenue Mile*** - A mile traveled by a bus with its door open, receiving passengers. Driving from the garage to the first bus stop at the beginning of the day, or the reverse at the end of the day is not counted.

***Revenue Hour*** - An hour of service by a bus with its door open, receiving passengers. Similar to Revenue Miles.

**Additional Notes:**

Capital spending can vary significantly from year to year for transit agencies- in a year when several new buses are purchased, capital expenditures may be high. In other years, it can be quite low. Operating spending tends to be more constant, and will vary more incrementally as services are introduced or changed.

Costs for paratransit operations and vanpool operations are not included in this spreadsheet; which was developed as an apples-to-apples comparison of the region's bus systems.

Duke University transit is not included because they do not report data to the National Transit Database.

***The numbers above are in \$2007 dollars.***

Source: 2006 National Transit Database (www.ntdprogram.gov)

## Summary of Motorbus Operations as Reported in National Transit Database (NTD)

GENERAL INDICATORS	C-Tran (Cary)	Chapel Hill Transit	DATA (Durham)	Wolfline (NCSU)	CAT (Raleigh)	Triangle Transit	Total for Triangle	Charlotte
Service Area Population	107,973	52,440	187,000	40,000	347,729	1,002,876	1,002,876.00	681,310
Service Area Size (square miles)	50	25	93	9	125	1,525	1,525	445
Passenger Trips	23,354	5,874,247	4,448,972	1,769,855	3,937,310	802,570	16,856,308	20,407,190
Passenger Miles	n/a	15,096,815	18,069,244	2,374,937	14,666,531	9,046,653	59,254,180	90,115,129
Vehicle Miles	174,720	1,970,247	2,498,127	580,909	2,323,373	2,568,596	10,115,972	12,281,801
Revenue Miles	160,990	1,824,976	2,319,403	536,619	2,116,629	1,976,007	8,934,624	10,926,679
Vehicle Hours	10,354	155,749	175,208	56,358	176,855	116,504	691,028	859,835
Revenue Hours	9,946	145,145	166,272	54,766	165,178	89,932	631,239	798,013
Total Operating Expense	\$597,461	\$9,322,684	\$12,881,584	\$3,495,198	\$12,130,446	\$8,176,686	\$46,604,059	\$66,491,287
Total Operating Expense (in 2007 \$)	\$614,342	\$9,586,095	\$13,245,552	\$3,593,954	\$12,473,191	\$8,407,717	\$47,920,851	\$68,369,994
Total Maintenance Expense	\$56,421	\$1,465,332	\$3,979,009	\$875,128	\$2,333,981	\$1,796,681	\$10,506,552	\$14,731,180
Total Maintenance Expense (in 2007 \$)	\$58,016	\$1,506,734	\$4,091,436	\$899,854	\$2,399,926	\$1,847,447	\$10,803,413	\$15,147,409
Total Employee FTEs	n/a	122.2	n/a	n/a	154.85	104.59	381.64	740.72
Employee Operating FTEs	n/a	104.17	n/a	n/a	117.97	80.3	302.44	538.47
Maintenance Employee FTEs	n/a	14.7	n/a	n/a	28.75	17.21	60.66	139.63
Administrative Employee FTEs	n/a	3.34	n/a	n/a	8.13	7.08	18.55	62.62
Vehicles Available for Maximum Service	7	86	49	26	75	65	308	324
Vehicles Operated in Maximum Service	5	77	37	23	48	49	239	263
Spare Ratio (%)	40	11.69	32.43	13.04	56.25	32.65	28.87	36.03
Total Gallons Consumed	n/a	549,446	n/a	n/a	669,024	466,708	1,685,178	2,966,328

Note: Duke University transit is not included because they do not report to the NTD.



# Capital Area Transit (CAT)

## General Information

### Urbanized Area (UZA) Statistics - 2000 Census

Raleigh, NC	
Square Miles	320
Population	541,527
Population Ranking out of 465 UZAs	67
Other UZAs Served	

### Service Area Statistics

Square Miles	125
Population	347,729

### Service Consumption

Annual Passenger Miles	15,248,677
Annual Unlinked Trips	4,049,995
Average Weekday Unlinked Trips	13,705
Average Saturday Unlinked Trips	7,555
Average Sunday Unlinked Trips	1,969

### Service Supplied

Annual Vehicle Revenue Miles	2,242,619
Annual Vehicle Revenue Hours	173,877
Vehicles Operated in Maximum Service	54
Vehicles Available for Maximum Service	85
Base Period Requirement	27

## Financial Information

Fare Revenues Earned \$1,970,955

<b>Sources of Operating Funds Expended</b>		
Fare Revenues	( 15%)	\$1,970,955
Local Funds	( 48%)	6,117,541
State Funds	( 17%)	2,122,772
Federal Assistance	( 19%)	2,361,805
Other Funds	( 1%)	189,149
<b>Total Operating Funds Expended</b>		<b>\$12,762,222</b>
<b>Sources of Capital Funds Expended</b>		
Local funds	( 39%)	\$164,494
State Funds	( 5%)	23,000
Federal Assistance	( 56%)	238,330
Other Funds	( 0%)	0
<b>Total Capital Funds Expended</b>		<b>\$425,824</b>

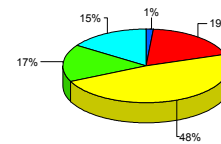
## Summary of Operating Expenses

Salary, Wages and Benefits	\$8,211,427
Materials and Supplies	2,566,555
Purchased Transportation	0
Other Operating Expenses	1,984,240
<b>Total Operating Expenses</b>	<b>\$12,762,222</b>
Reconciling Cash Expenditures	\$0

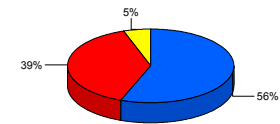
## Vehicles Operated in Maximum Service and Uses of Capital Funds

	Directly Operated	Purchased Transportation <sup>1</sup>	Revenue Vehicles	Systems and Guideways	Facilities and Stations	Other	Total
Bus	48	0	\$0	\$0	\$0	\$0	\$0
Demand Response	6	0	\$396,825	\$0	\$0	\$28,999	\$425,824
<b>Total</b>	<b>54</b>	<b>0</b>	<b>\$396,825</b>	<b>\$0</b>	<b>\$0</b>	<b>\$28,999</b>	<b>\$425,824</b>

## Sources of Operating Funds Expended



## Sources of Capital Funds Expended



## Modal Characteristics

	Operating Expenses <sup>1</sup>	Fare Revenues <sup>1</sup>	Uses of Capital Funds	Annual Passenger Miles	Annual Vehicle Revenue Miles	Annual Unlinked Trips	Annual Vehicle Revenue Hours	Fixed Guideway Directional Route Miles	Vehicles Available for Maximum Service	Average Fleet Age in Years	Vehicles Operated in Maximum Service	Peak to Base Ratio	Percent Spares
Bus	\$12,130,446	\$1,945,555	\$0	14,666,531	2,116,629	3,937,310	165,178	0.0	75	7.1	48	1.78	56%
Demand Response	\$631,776	\$25,400	\$425,824	582,146	125,990	112,685	8,699	N/A	10	4.2	6	N/A	67%

## Performance Measures

### Service Efficiency

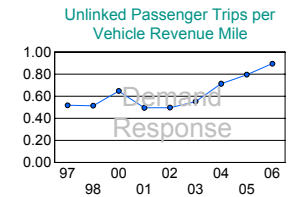
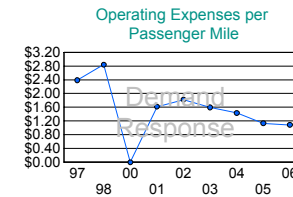
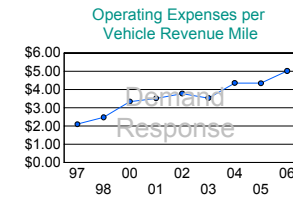
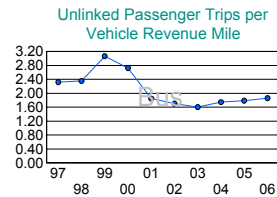
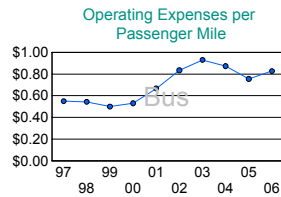
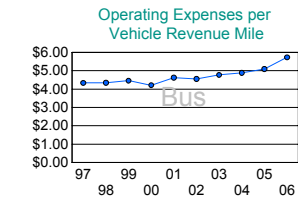
	Operating Expense per Vehicle Revenue Mile	Operating Expense per Vehicle Revenue Hour
Bus	\$5.73	\$73.44
Demand Response	\$5.01	\$72.63

### Cost Effectiveness

	Operating Expense per Passenger Mile	Operating Expense per Unlinked Passenger Trip
Bus	\$0.83	\$3.08
Demand Response	\$1.09	\$5.61

### Service Effectiveness

	Unlinked Passenger Trips per Vehicle Revenue Mile	Unlinked Passenger Trips per Vehicle Revenue Hour
Bus	1.86	23.84
Demand Response	0.89	12.95



<sup>1</sup> Excludes data for purchased transportation reported separately

General Information

Urbanized Area (UZA) Statistics - 2000 Census

Durham, NC	
Square Miles	157
Population	287,796
Population Ranking out of 465 UZAs	111
Other UZAs Served	

Service Area Statistics

Square Miles	25
Population	52,440

Service Consumption

Annual Passenger Miles	15,398,909
Annual Unlinked Trips	5,951,609
Average Weekday Unlinked Trips	24,336
Average Saturday Unlinked Trips	1,761
Average Sunday Unlinked Trips	852

Service Supplied

Annual Vehicle Revenue Miles	2,202,825
Annual Vehicle Revenue Hours	173,033
Vehicles Operated in Maximum Service	93
Vehicles Available for Maximum Service	108
Base Period Requirement	27

Financial Information

<b>Fare Revenues Earned</b>	\$5,709,140
<b>Sources of Operating Funds Expended</b>	
Fare Revenues (48%)	\$5,709,140
Local Funds (15%)	1,716,592
State Funds (26%)	3,098,760
Federal Assistance (10%)	1,178,509
Other Funds (1%)	113,158
<b>Total Operating Funds Expended</b>	<b>\$11,816,159</b>
<b>Sources of Capital Funds Expended</b>	
Local funds (0%)	\$0
State Funds (6%)	297,530
Federal Assistance (94%)	4,283,179
Other Funds (0%)	0
<b>Total Capital Funds Expended</b>	<b>\$4,580,709</b>

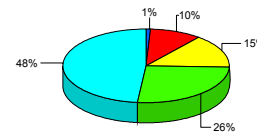
Summary of Operating Expenses

Salary, Wages and Benefits	\$8,289,671
Materials and Supplies	1,887,248
Purchased Transportation	0
Other Operating Expenses	795,211
<b>Total Operating Expenses</b>	<b>\$10,972,130</b>
Reconciling Cash Expenditures	\$844,029

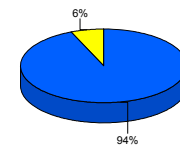
Vehicles Operated in Maximum Service and Uses of Capital Funds

	Directly Operated	Purchased Transportation <sup>1</sup>	Revenue Vehicles	Systems and Guideways	Facilities and Stations	Other	Total
Bus	77	0	\$2,135,717	\$88,913	\$1,968,398	\$79,265	\$4,272,293
Demand Response	16	0	\$308,416	\$0	\$0	\$0	\$308,416
<b>Total</b>	<b>93</b>	<b>0</b>	<b>\$2,444,133</b>	<b>\$88,913</b>	<b>\$1,968,398</b>	<b>\$79,265</b>	<b>\$4,580,709</b>

Sources of Operating Funds Expended



Sources of Capital Funds Expended



Modal Characteristics

	Operating Expenses <sup>1</sup>	Fare Revenues <sup>1</sup>	Uses of Capital Funds	Annual Passenger Miles	Annual Vehicle Revenue Miles	Annual Unlinked Trips	Annual Vehicle Revenue Hours	Fixed Guideway Directional Route Miles	Vehicles Available for Maximum Service	Average Fleet Age in Years	Vehicles Operated in Maximum Service	Peak to Base Ratio	Percent Spares
Bus	\$9,322,684	\$5,706,718	\$4,272,293	15,096,815	1,824,976	5,874,247	145,145	0.0	86	9.3	77	2.26	12%
Demand Response	\$1,649,446	\$2,422	\$308,416	302,094	377,849	77,362	27,888	N/A	22	3.2	16	N/A	38%

Performance Measures

Service Efficiency

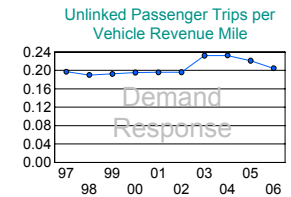
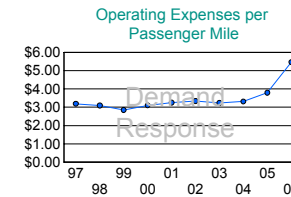
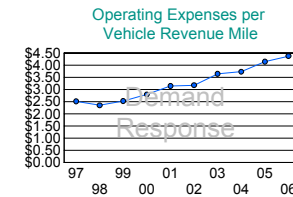
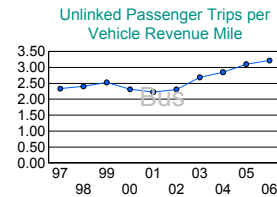
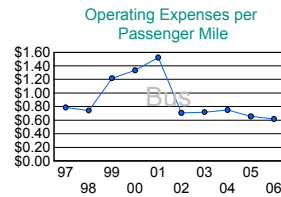
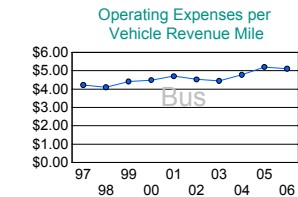
	Operating Expense per Vehicle Revenue Mile	Operating Expense per Vehicle Revenue Hour
Bus	\$5.11	\$64.23
Demand Response	\$4.37	\$59.15

Cost Effectiveness

	Operating Expense per Passenger Mile	Operating Expense per Unlinked Passenger Trip
Bus	\$0.62	\$1.59
Demand Response	\$5.46	\$21.32

Service Effectiveness

	Unlinked Passenger Trips per Vehicle Revenue Mile	Unlinked Passenger Trips per Vehicle Revenue Hour
Bus	3.22	40.47
Demand Response	0.20	2.77



<sup>1</sup> Excludes data for purchased transportation reported separately

# Durham Area Transit Authority (DATA)

## General Information

### Urbanized Area (UZA) Statistics - 2000 Census

Durham, NC	
Square Miles	157
Population	287,796
Population Ranking out of 465 UZAs	111
Other UZAs Served	

### Service Area Statistics

Square Miles	93
Population	187,000

### Service Consumption

Annual Passenger Miles	18,646,223
Annual Unlinked Trips	4,530,367
Average Weekday Unlinked Trips	15,083
Average Saturday Unlinked Trips	8,670
Average Sunday Unlinked Trips	3,879

### Service Supplied

Annual Vehicle Revenue Miles	2,975,062
Annual Vehicle Revenue Hours	205,977
Vehicles Operated in Maximum Service	68
Vehicles Available for Maximum Service	92
Base Period Requirement	32

## Financial Information

Fare Revenues Earned \$2,533,896

<b>Sources of Operating Funds Expended</b>		
Fare Revenues	( 17%)	\$2,533,896
Local Funds	( 52%)	7,862,064
State Funds	( 15%)	2,286,723
Federal Assistance	( 16%)	2,424,028
Other Funds	( 0%)	0
<b>Total Operating Funds Expended</b>		<b>\$15,106,711</b>
<b>Sources of Capital Funds Expended</b>		
Local funds	( 0%)	\$0
State Funds	( 0%)	0
Federal Assistance	(100%)	233,882
Other Funds	( 0%)	0
<b>Total Capital Funds Expended</b>		<b>\$233,882</b>

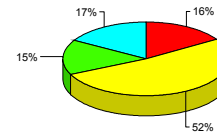
## Summary of Operating Expenses

Salary, Wages and Benefits	\$84,213
Materials and Supplies	1,560,324
Purchased Transportation	11,597,866
Other Operating Expenses	1,864,308
<b>Total Operating Expenses</b>	<b>\$15,106,711</b>
Reconciling Cash Expenditures	\$0

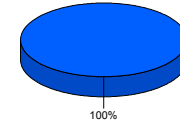
## Vehicles Operated in Maximum Service and Uses of Capital Funds

	Directly Operated	Purchased Transportation <sup>1</sup>	Revenue Vehicles	Systems and Guideways	Facilities and Stations	Other	Total
Bus	0	37	\$0	\$10,000	\$31,993	\$144,365	\$186,358
Demand Response	0	31	\$0	\$0	\$0	\$47,524	\$47,524
<b>Total</b>	<b>0</b>	<b>68</b>	<b>\$0</b>	<b>\$10,000</b>	<b>\$31,993</b>	<b>\$191,889</b>	<b>\$233,882</b>

## Sources of Operating Funds Expended



## Sources of Capital Funds Expended



## Modal Characteristics

	Operating Expenses <sup>1</sup>	Fare Revenues <sup>1</sup>	Uses of Capital Funds	Annual Passenger Miles	Annual Vehicle Revenue Miles	Annual Unlinked Trips	Annual Vehicle Revenue Hours	Fixed Guideway Directional Route Miles	Vehicles Available for Maximum Service	Average Fleet Age in Years	Vehicles Operated in Maximum Service	Peak to Base Ratio	Percent Spares
Bus	\$12,881,584	\$2,385,405	\$186,358	18,069,244	2,319,403	4,448,972	166,272	0.0	49	5.1	37	1.16	32%
Demand Response	\$2,225,127	\$148,491	\$47,524	576,979	655,659	81,395	39,705	N/A	43	0.0	31	N/A	39%

## Performance Measures

### Service Efficiency

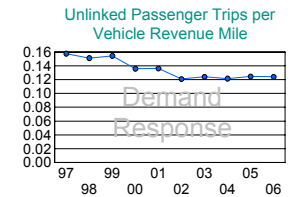
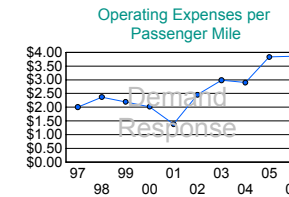
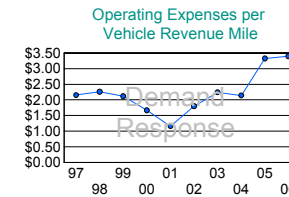
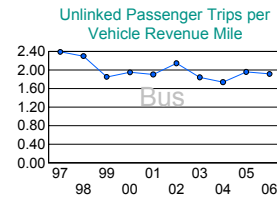
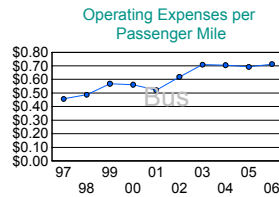
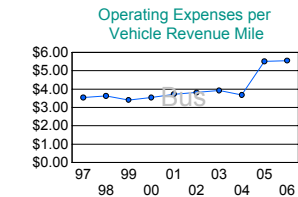
	Operating Expense per Vehicle Revenue Mile	Operating Expense per Vehicle Revenue Hour
Bus	\$5.55	\$77.47
Demand Response	\$3.39	\$56.04

### Cost Effectiveness

	Operating Expense per Passenger Mile	Operating Expense per Unlinked Passenger Trip
Bus	\$0.71	\$2.90
Demand Response	\$3.86	\$27.34

### Service Effectiveness

	Unlinked Passenger Trips per Vehicle Revenue Mile	Unlinked Passenger Trips per Vehicle Revenue Hour
Bus	1.92	26.76
Demand Response	0.12	2.05



<sup>1</sup> Excludes data for purchased transportation reported separately

**General Information**

**Urbanized Area (UZA) Statistics - 2000 Census**

Raleigh, NC	
Square Miles	320
Population	541,527
Population Ranking out of 465 UZAs	67
Other UZAs Served	

**Service Area Statistics**

Square Miles	9
Population	40,000

**Service Consumption**

Annual Passenger Miles	2,374,937
Annual Unlinked Trips	1,769,855
Average Weekday Unlinked Trips	8,843
Average Saturday Unlinked Trips	198
Average Sunday Unlinked Trips	176

**Service Supplied**

Annual Vehicle Revenue Miles	536,619
Annual Vehicle Revenue Hours	54,766
Vehicles Operated in Maximum Service	23
Vehicles Available for Maximum Service	26
Base Period Requirement	23

**Financial Information**

**Fare Revenues Earned** \$2,250,582

<b>Sources of Operating Funds Expended</b>	
Fare Revenues (64%)	\$2,250,582
Local Funds (0%)	0
State Funds (0%)	0
Federal Assistance (0%)	0
Other Funds (36%)	1,244,616
<b>Total Operating Funds Expended</b>	<b>\$3,495,198</b>
<b>Sources of Capital Funds Expended</b>	
Local funds (0%)	\$0
State Funds (0%)	0
Federal Assistance (0%)	0
Other Funds (100%)	79,597
<b>Total Capital Funds Expended</b>	<b>\$79,597</b>

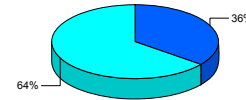
**Summary of Operating Expenses**

Salary, Wages and Benefits	\$118,064
Materials and Supplies	14,335
Purchased Transportation	3,221,926
Other Operating Expenses	140,873
<b>Total Operating Expenses</b>	<b>\$3,495,198</b>
Reconciling Cash Expenditures	\$0

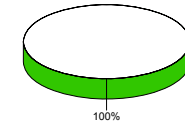
**Vehicles Operated in Maximum Service and Uses of Capital Funds**

	Directly Operated	Purchased Transportation <sup>1</sup>	Revenue Vehicles	Systems and Guideways	Facilities and Stations	Other	Total
Bus	0	23	\$0	\$0	\$0	\$79,597	\$79,597

**Sources of Operating Funds Expended**



**Sources of Capital Funds Expended**

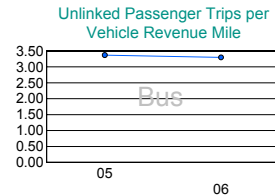
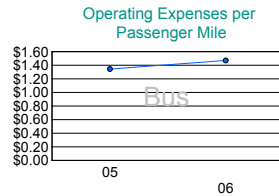
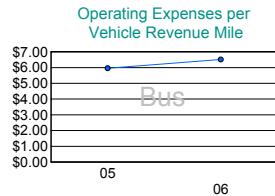


**Modal Characteristics**

	Operating Expenses <sup>1</sup>	Fare Revenues <sup>1</sup>	Uses of Capital Funds	Annual Passenger Miles	Annual Vehicle Revenue Miles	Annual Unlinked Trips	Annual Vehicle Revenue Hours	Fixed Guideway Directional Route Miles	Vehicles Available for Maximum Service	Average Fleet Age in Years	Vehicles Operated in Maximum Service	Peak to Base Ratio	Percent Spares
Bus	\$3,495,198	\$2,250,582	\$79,597	2,374,937	536,619	1,769,855	54,766	0.0	26	8.0	23	1.00	13%

**Performance Measures**

	Service Efficiency: Operating Expense per Vehicle Revenue Mile	Operating Expense per Vehicle Revenue Hour	Cost Effectiveness: Operating Expense per Passenger Mile	Operating Expense per Unlinked Passenger Trip	Service Effectiveness: Unlinked Passenger Trips per Vehicle Revenue Mile	Unlinked Passenger Trips per Vehicle Revenue Hour
Bus	\$6.51	\$63.82	\$1.47	\$1.97	3.30	32.32



<sup>1</sup> Excludes data for purchased transportation reported separately

# Research Triangle Regional Public Transportation Authority (TTA)

## General Information

### Urbanized Area (UZA) Statistics - 2000 Census

Durham, NC	
Square Miles	157
Population	287,796
Population Ranking out of 465 UZAs	111
Other UZAs Served	66

### Service Area Statistics

Square Miles	1,525
Population	1,002,876

### Service Consumption

Annual Passenger Miles	22,779,971
Annual Unlinked Trips	1,229,451
Average Weekday Unlinked Trips	4,749
Average Saturday Unlinked Trips	657
Average Sunday Unlinked Trips	0

### Service Supplied

Annual Vehicle Revenue Miles	3,205,446
Annual Vehicle Revenue Hours	121,922
Vehicles Operated in Maximum Service	120
Vehicles Available for Maximum Service	145
Base Period Requirement	12

## Financial Information

Fare Revenues Earned \$1,609,219

### Sources of Operating Funds Expended

Fare Revenues	( 16%)	\$1,609,219
Local Funds	( 24%)	2,452,216
State Funds	( 22%)	2,250,915
Federal Assistance	( 28%)	2,915,666
Other Funds	( 10%)	1,059,646
<b>Total Operating Funds Expended</b>		<b>\$10,287,662</b>

### Sources of Capital Funds Expended

Local funds	( 46%)	\$11,667,812
State Funds	( 20%)	4,951,644
Federal Assistance	( 34%)	8,644,628
Other Funds	( 0%)	0
<b>Total Capital Funds Expended</b>		<b>\$25,264,084</b>

## Summary of Operating Expenses

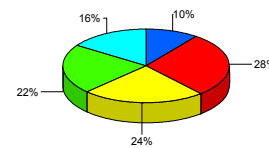
Salary, Wages and Benefits	\$6,085,185
Materials and Supplies	2,269,663
Purchased Transportation	0
Other Operating Expenses	1,922,446
<b>Total Operating Expenses</b>	<b>\$10,277,294</b>

Reconciling Cash Expenditures \$10,368

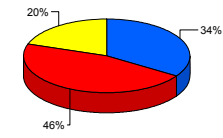
## Vehicles Operated in Maximum Service and Uses of Capital Funds

	Directly Operated	Purchased Transportation <sup>1</sup>	Revenue Vehicles	Systems and Guideways	Facilities and Stations	Other	Total
Bus	49	0	\$0	\$736,586	\$0	\$0	\$736,586
Commuter Rail	0	0	\$0	\$0	\$0	\$24,527,498	\$24,527,498
Demand Response	5	0	\$0	\$0	\$0	\$0	\$0
Vanpool	66	0	\$0	\$0	\$0	\$0	\$0
<b>Total</b>	<b>120</b>	<b>0</b>	<b>\$0</b>	<b>\$736,586</b>	<b>\$0</b>	<b>\$24,527,498</b>	<b>\$25,264,084</b>

## Sources of Operating Funds Expended



## Sources of Capital Funds Expended

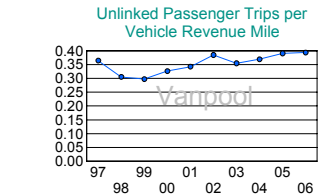
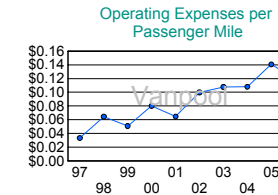
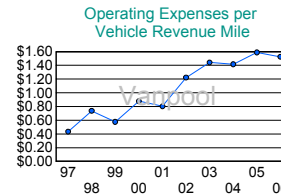
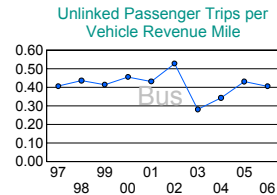
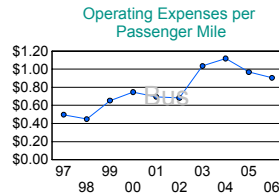
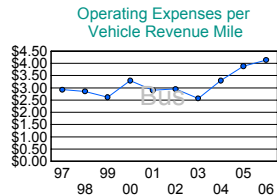


## Modal Characteristics

	Operating Expenses <sup>1</sup>	Fare Revenues <sup>1</sup>	Uses of Capital Funds	Annual Passenger Miles	Annual Vehicle Revenue Miles	Annual Unlinked Trips	Annual Vehicle Revenue Hours	Fixed Guideway Directional Route Miles	Vehicles Available for Maximum Service	Average Fleet Age in Years	Vehicles Operated in Maximum Service	Peak to Base Ratio	Percent Spares
Bus	\$8,176,686	\$977,991	\$736,586	9,046,653	1,976,007	802,570	89,932	0.0	65	6.4	49	4.08	33%
Vanpool	\$1,611,250	\$509,443	\$0	13,486,165	1,056,781	415,932	26,312	N/A	74	4.8	66	N/A	12%
Demand Response	\$489,358	\$121,785	\$0	247,153	172,658	10,949	5,678	N/A	6	3.7	5	N/A	20%

## Performance Measures

	Service Efficiency: Operating Expense per Vehicle Revenue Mile	Service Efficiency: Operating Expense per Vehicle Revenue Hour	Cost Effectiveness: Operating Expense per Passenger Mile	Cost Effectiveness: Operating Expense per Unlinked Passenger Trip	Service Effectiveness: Unlinked Passenger Trips per Vehicle Revenue Mile	Service Effectiveness: Unlinked Passenger Trips per Vehicle Revenue Hour
Bus	\$4.14	\$90.92	\$0.90	\$10.19	0.41	8.92
Vanpool	\$1.52	\$61.24	\$0.12	\$3.87	0.39	15.81
Demand Response	\$2.83	\$86.18	\$1.98	\$44.69	0.06	1.93



<sup>1</sup> Excludes data for purchased transportation reported separately

# Town of Cary (CTRAN)

## General Information

### Urbanized Area (UZA) Statistics - 2000 Census

Raleigh, NC	
Square Miles	320
Population	541,527
Population Ranking out of 465 UZAs	67
Other UZAs Served	

### Service Area Statistics

Square Miles	50
Population	107,973

### Service Consumption

Annual Passenger Miles	357,070
Annual Unlinked Trips	63,016
Average Weekday Unlinked Trips	309
Average Saturday Unlinked Trips	69
Average Sunday Unlinked Trips	0

### Service Supplied

Annual Vehicle Revenue Miles	598,933
Annual Vehicle Revenue Hours	33,131
Vehicles Operated in Maximum Service	16
Vehicles Available for Maximum Service	20
Base Period Requirement	3

## Financial Information

### Fare Revenues Earned

Sources of Operating Funds Expended	\$94,535
Fare Revenues ( 5%)	\$94,535
Local Funds ( 75%)	1,469,310
State Funds ( 12%)	236,296
Federal Assistance ( 8%)	165,614
Other Funds ( 0%)	0
<b>Total Operating Funds Expended</b>	<b>\$1,965,755</b>

### Sources of Capital Funds Expended

Local funds	\$0
State Funds	0
Federal Assistance	0
Other Funds	0
<b>Total Capital Funds Expended</b>	<b>\$0</b>

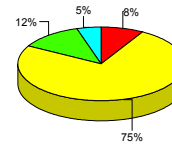
## Summary of Operating Expenses

Salary, Wages and Benefits	\$86,085
Materials and Supplies	133,027
Purchased Transportation	1,715,483
Other Operating Expenses	31,160
<b>Total Operating Expenses</b>	<b>\$1,965,755</b>
Reconciling Cash Expenditures	\$0

## Vehicles Operated in Maximum Service and Uses of Capital Funds

	Directly Operated	Purchased Transportation <sup>1</sup>	Revenue Vehicles	Systems and Guideways	Facilities and Stations	Other	Total
Bus	0	5	\$0	\$0	\$0	\$0	\$0
Demand Response	0	11	\$0	\$0	\$0	\$0	\$0
<b>Total</b>	<b>0</b>	<b>16</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>

## Sources of Operating Funds Expended



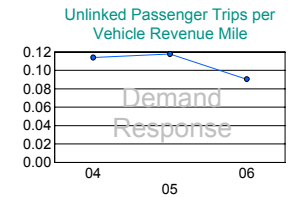
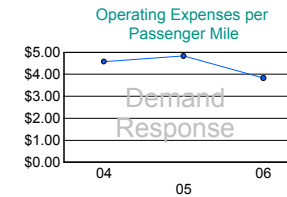
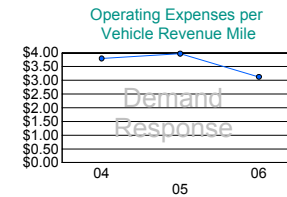
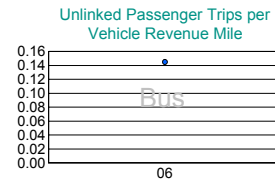
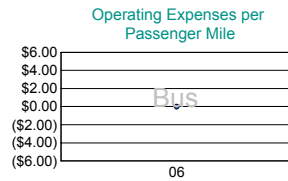
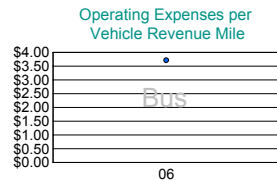
## Sources of Capital Funds Expended

## Modal Characteristics

	Operating Expenses <sup>1</sup>	Fare Revenues <sup>1</sup>	Uses of Capital Funds	Annual Passenger Miles	Annual Vehicle Revenue Miles	Annual Unlinked Trips	Annual Vehicle Revenue Hours	Fixed Guideway Directional Route Miles	Vehicles Available for Maximum Service	Average Fleet Age in Years	Vehicles Operated in Maximum Service	Peak to Base Ratio	Percent Spares
Bus	\$597,461	\$27,557	\$0	0 W	160,990	23,354	9,946	0.0	7	1.3	5	1.67	40%
Demand Response	\$1,368,294	\$66,978	\$0	357,070	437,943	39,662	23,185	N/A	13	2.7	11	N/A	18%

## Performance Measures

	Service Efficiency: Operating Expense per Vehicle Revenue Mile	Service Efficiency: Operating Expense per Vehicle Revenue Hour	Cost Effectiveness: Operating Expense per Passenger Mile	Cost Effectiveness: Operating Expense per Unlinked Passenger Trip	Service Effectiveness: Unlinked Passenger Trips per Vehicle Revenue Mile	Service Effectiveness: Unlinked Passenger Trips per Vehicle Revenue Hour
Bus	\$3.71	\$60.07	\$0.00 W	\$25.58	0.15	2.35
Demand Response	\$3.12	\$59.02	\$3.83	\$34.50	0.09	1.71



Note: First year reporting

<sup>1</sup> Excludes data for purchased transportation reported separately

## Appendix G: Financial Model and Funding for the Regional Transit Vision Plan

The STAC financial plan was developed on the basis of funding the entire vision which included enhanced region-wide bus service, urban circulators, and fixed guideway (rail) investments.

The financial model was adjusted to accommodate the purchase of 150 buses, replacement purchases after a 12-year life, all operations and maintenance costs, and associated maintenance facility requirements.

The fixed guideway (rail) portion of the vision included Chapel Hill to Durham, Durham to Cary, Cary to Raleigh, and Raleigh to Durant Road (north of I-540 off Capital Blvd). The total cost of the rail vision is estimated to be \$2.27 Billion in 2007 dollars.

Costs are broken out by project according to an assumed set of delivery dates. Although the STAC did not specify any priorities or timing for projects, the financial model assumed the order and timing of project delivery according to the table above in order to calculate the inflated values beyond CY2007. The completion dates listed are for modeling purposes only to allow for the projection of financing costs and revenue flows. Actual sequencing of projects will be influenced by a variety of factors.

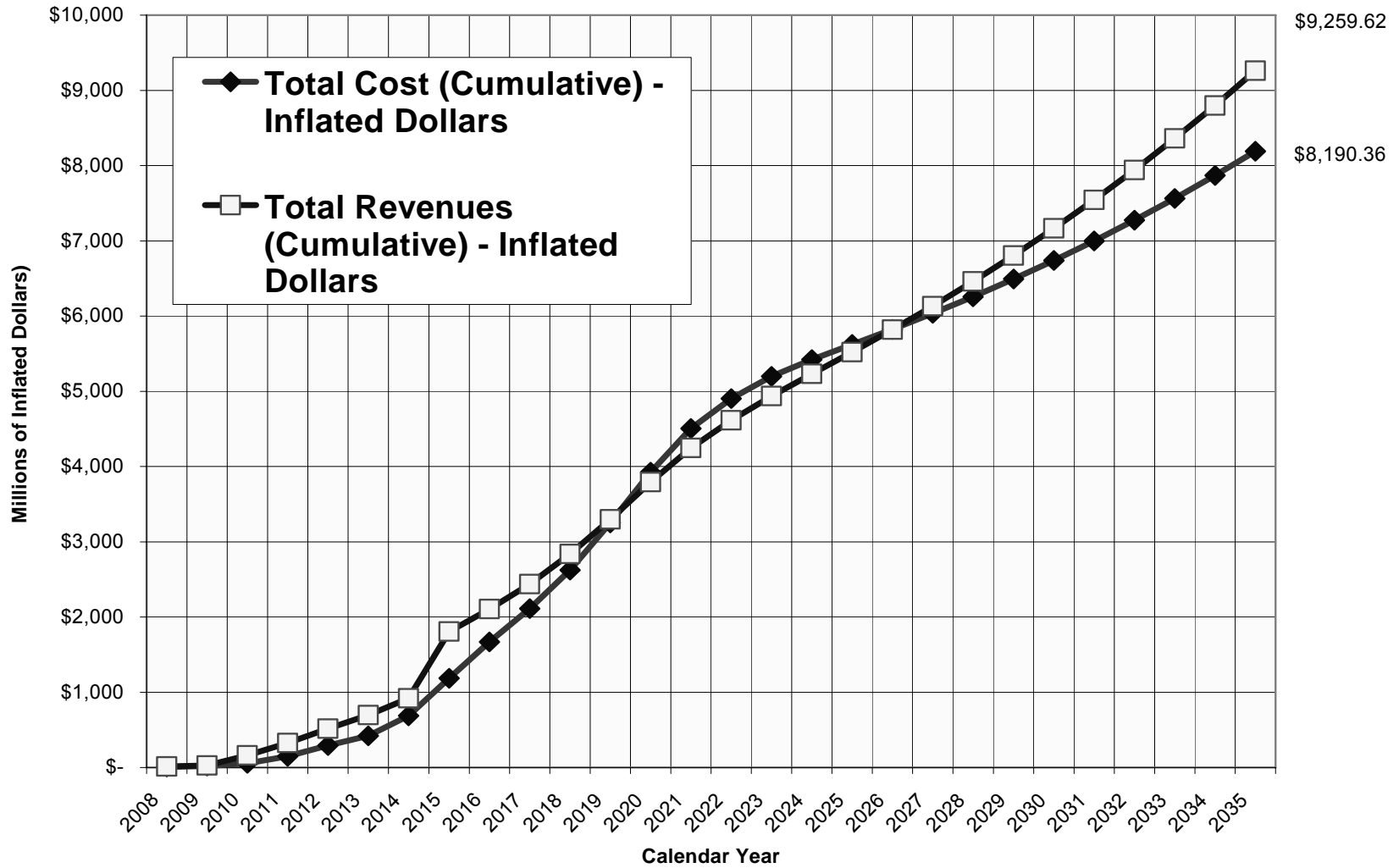
<b>Completion Date *</b>	<b>Project Description</b>	<b>Capital Cost in 2007 dollars **</b>
2017	NW Cary to Durant Road (North of I-540)	\$774.1 million
2020	Duke Med Ctr to Triangle Metro Center (TMC)	\$400.0 million
2020	Triangle Metro Center (TMC) to RDU Airport	\$155.0 million
2022	Chapel Hill to Durham Multimodal Center	\$739.4 million
2024	Triangle Metro Center (TMC) to NW Cary	\$203.6 million

\* Assumes the project is completed on December 31<sup>st</sup> of the given year with a corresponding opening date a day later. All years are calendar years.

\*\* The total cost of the fixed guideway (rail) projects is \$2.27 Billion in 2007 dollars.

The following charts show costs and revenues in Year of Expenditure (YOE), e.g. inflated. The charts reflect a set of assumed revenue sources and total costs for capital and operations and maintenance. The cost elements include the costs associated with the Enhanced Bus service, the Urban Circulators, and the Rail investments shown above. See Section 7 for discussion of revenue and cost assumptions.

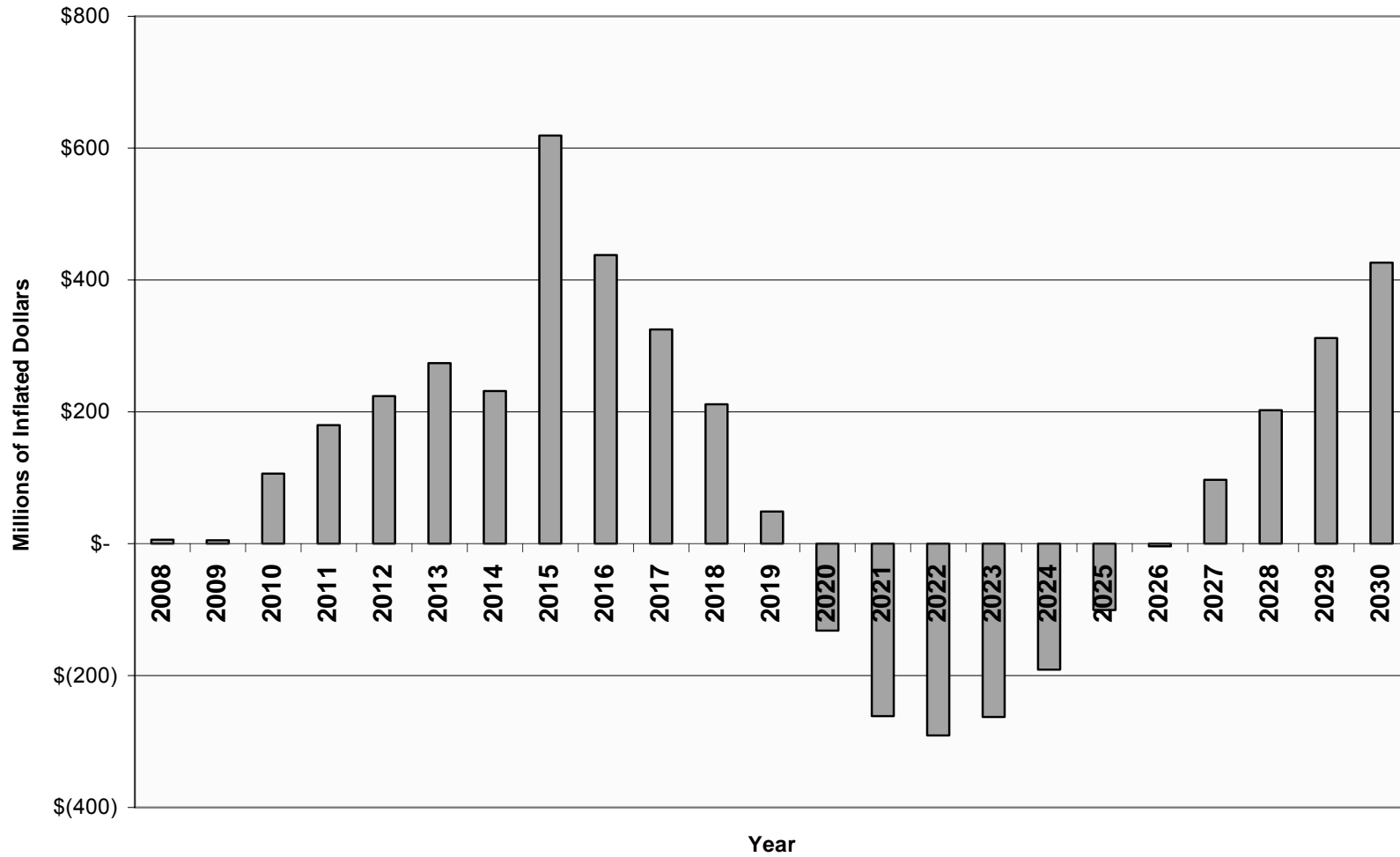
## Cumulative Revenues and Cost



**Chart 1:** This chart depicts cumulative cost and revenues in Year of Expenditure (YOE, e.g. inflated \$).

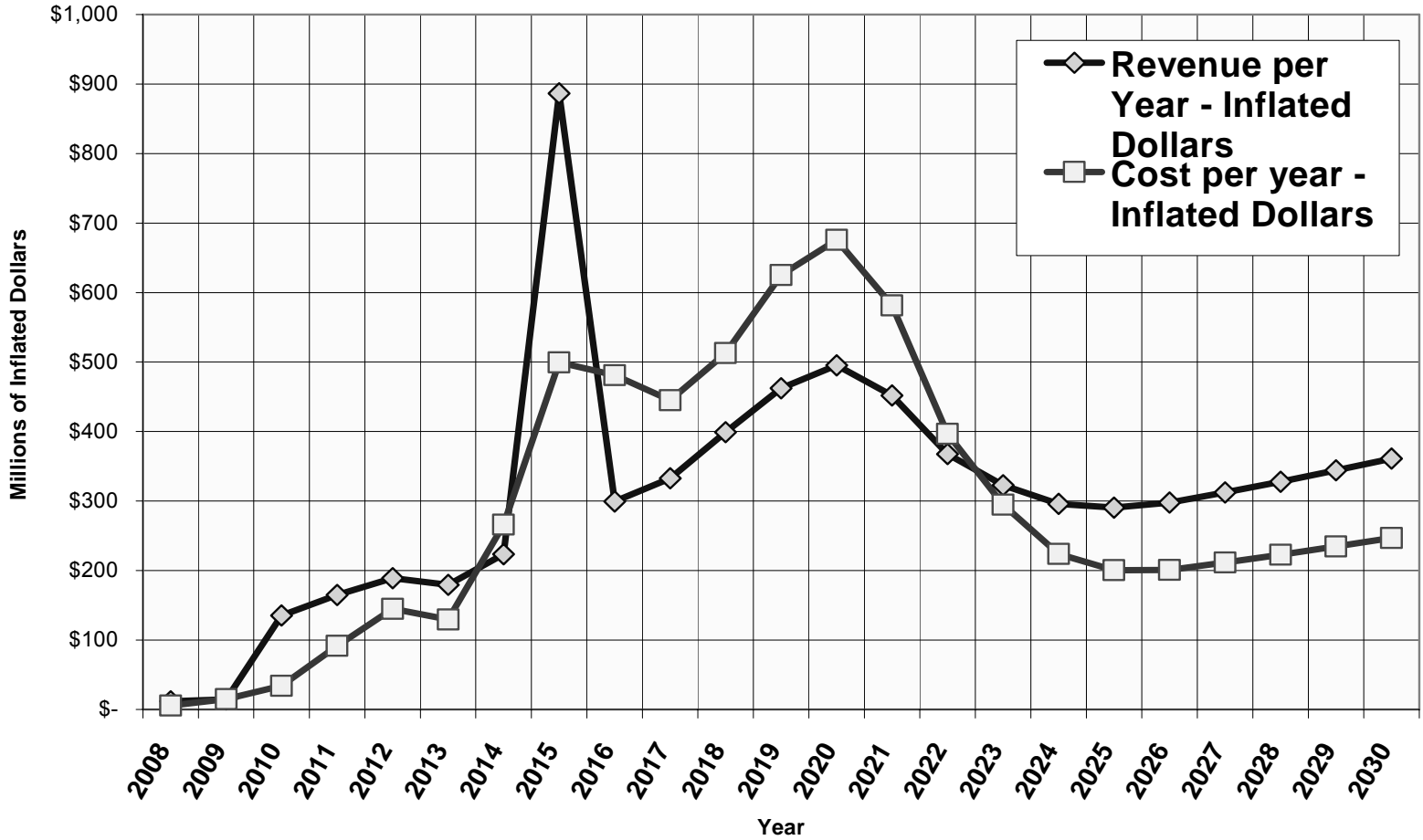


### Project Investment Ending Balances



**Chart 2:** Although the assumed funding sources can cover the total expected costs, cash flow issues exist in the 2020 through 2025 years that can be resolved by additional financing that utilizes the surpluses created beyond 2026.

### Annual Costs vs Annual Revenues

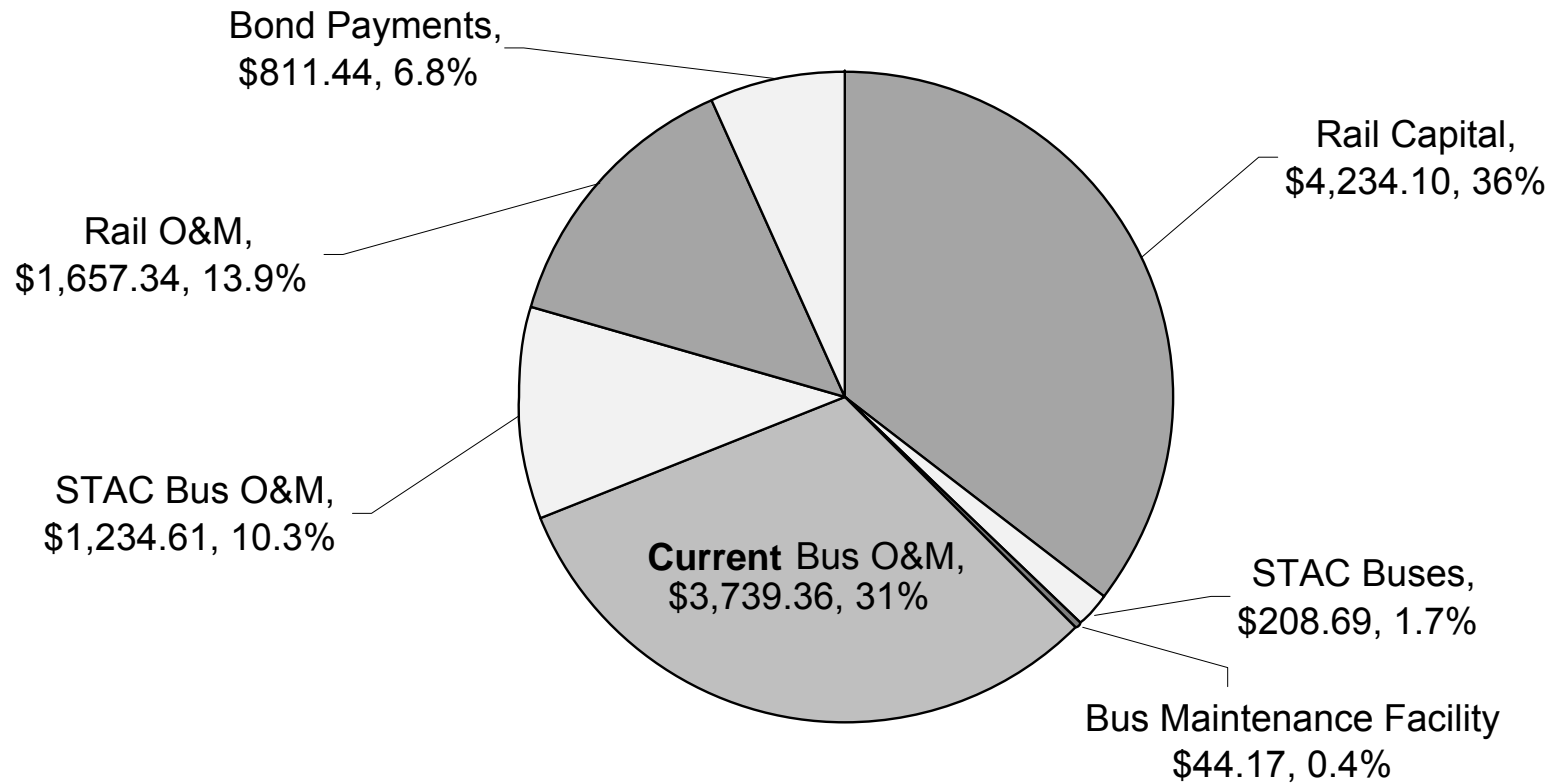


**Chart 3:** This chart shows the annual revenues and expenditures by calendar year. It depicts the areas where net cash flow is either positive or negative.

# STAC Cost Elements + Current Bus Service

Year of Expenditure (YOE) thru 2035, in \$Millions

Total: \$11.9 Billion



**Chart 4:** All charts other than this one only assume new incremental costs. The cost of current, region-wide bus operations (\$60 million/year inflated through 2035) has been added to reflect the impact of **all** cost elements through 2035.

## Appendix H: Definitions and Acronyms

**Bus:** Rubber-tired vehicles operating on roadways or on specially designated bus lanes or guideways. Buses are powered by diesel, gasoline, battery or alternative fuel engines contained within the vehicle.

**Busway:** A fixed guideway used by bus transit vehicles.

**Commuter Rail:** rail transit service that operates on a fixed guideway, completely separate from automobile traffic. Can operate on same tracks as freight rail service. Schedules and stations designed to serve commuters within a region.

**Diesel Multiple Unit (DMU) Trains:** Self-propelled, diesel-powered passenger rail cars which can be driven from either end, eliminating the need to turn the train around. DMUs are designed to allow rail cars to be quickly coupled or uncoupled, lengthening or shortening the train to accommodate passenger volumes.

**Express service:** Fixed route transit service with a limited number of stops on a route, usually at the beginning and end of the route. Usually designed to serve commuters traveling relatively long distances; can effectively link park and ride lots or transit hubs with major employment destinations.

**Fixed Guideway:** A transit corridor that physically defines the permanent path of transit vehicles with tracks, overhead power connections (catenary), or other physical guidance system. Can be at the same level as a roadway, elevated, or below grade. A fixed guideway is generally reserved exclusively for transit vehicles allowing them to operate freely, apart from auto and truck congestion; in some places trolleys and streetcars operate in mixed traffic. Because these major capital investments are fixed in place, fixed guideway transit systems focus growth around the stations and stops in the same way that roadways encourage development oriented to auto travel. Throughout the country, major fixed guideway investments induce transit oriented development that is denser, mixed-use and walkable, thereby enhancing ridership and generating considerable returns on the public investment.

**Fixed Route:** Transit service that follows a fixed timetable and serves a routine set of stops.

**Flexible Route:** Transit route that does not follow a set timetable or service a routine set of stops. Also called demand-responsive transit.

**Full schedule service:** Fixed route transit service that operates over the full day, plus weekends and evenings.

**Grade separation:** Paths, special lanes, freeways, or fixed guideways that are completely separated from regular roadways so as not to be delayed by cross-streets or roadway congestion (Victoria Transportation Institute).

**Heavy Rail:** High-speed, passenger rail cars operating singly or in trains of two or more cars on fixed rails in separate rights-of-way from which all other vehicular and foot traffic are excluded.

**Interested Party:** An individual, group, agency or other entity with an interest in the outcome of a transportation plan or project. Section 450.316 of the 2007 federal transportation legislation, called SAFETEA-LU, specifically notes that “citizens, affected public agencies, representatives of public transportation employees, freight shippers, providers of freight transportation services, private providers of transportation, representatives of users of public transportation, representatives of users of pedestrian walkways and bicycle transportation facilities, representatives of the disabled, and other interested parties” should be provided with reasonable opportunities to be involved in the MPO planning processes. Interested parties are sometimes referred to as stakeholders.

**Light Rail:** Lightweight passenger rail cars operating on a fixed guideway that may not be fully separated from traffic, allowing for flexibility in locating LRT corridors along existing roadways or at intersections and crossings. Light rail vehicles are driven electrically with power being drawn from an overhead electric line.

**Major Capital Investment in Transit:** The cost and physical elements needed to bring a fixed guideway transit system or individual corridor into service. Includes the vehicles (trains and buses); land needed for corridor in which the transit vehicles operate; tracks, bridges, overpasses, and other structures; communications equipment, utilities, overhead electrical wires and power supply; stations, parking and access. Also includes planning, design, construction, and operational testing prior to beginning service.

**Public Transit:** a transportation system for moving passengers that is open to the public. Also referred to as public transportation.

**Rush Hour Only Service:** Fixed route transit service that operates during peak commuting hours, sometimes also includes midday service. In the Triangle region, the morning peak travel period is roughly 3 hours long, from 6 AM to 9 AM; our evening peak is roughly 4 hours long, from 3:30 PM to 7:30 PM.

**Transit:** Transportation service provided on multi-passenger vehicles such as trains, buses, vans, trolleys and streetcars.

## List of Acronyms

BRT	Bus Rapid Transit. A bus-based transit system operating on a roadway or section of pavement reserved just for buses.
Capital Area MPO	Capital Area Metropolitan Planning Organization: Includes Wake County and portions of Granville, Franklin, Johnston, and Harnett Counties, and the municipalities therein.
CAT	Capital Area Transit: The local transit system agency serving Raleigh.
CHT	Chapel Hill Transit. The local transit system serving Chapel Hill, UNC-CH and Carrboro
CSX	CSX Railroad
C-Tran	Cary Transit. The local transit service serving Cary.
DATA	Durham Area Transit Authority. The local transit service serving Durham.
DCHC MPO	Durham-Chapel Hill-Carrboro Metropolitan Planning Organization. Includes Durham and Orange Counties, as well as a portion of Chatham County and the municipalities therein.
DMU	Diesel Multiple Unit. Self-propelled diesel-powered trains.

Duke Transit	Duke University Transit Service
EIS	Environmental Impact Statement. A document developed through a cooperative process that identifies the impacts associated with the development of a project, and mitigation measures designed to address the impacts. Required under federal legislation for projects receiving federal funding.
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HOT	High Occupancy Toll lanes
HOV	High Occupancy Vehicle. HOV lanes are those designed for buses and/or vehicles with 2 (or 3) or more passengers
ITRE	Institute For Transportation Research and Education
LRT	Light Rail Transit. An urban railway system characterized by its ability to operate single cars or short trains in streets or exclusive (reserved just for rail vehicles) right-of-way, capable of discharging passengers at track or car floor level.
LRTP	Long Range Transportation Plan. The official plan of a Metropolitan Planning Organization identifying new highway, transit, pedestrian/bicycle and other transportation investments planned for a period of at least 20 years. A project must be in an LRTP found to conform to air quality standards before it can be built.
MPO	Metropolitan Planning Organization; an organization made up of representatives from local government, transit providers and NCDOT, who are collectively responsible for regional transportation planning.
NCDOT	NC Department of Transportation. State agency responsible for transportation facilities and services.
NCRR	North Carolina Railroad Company
Wolfline	North Carolina State University transit service
NEPA	National Environmental Policy Act. Triggered when projects require federal funding and/or permits.
NS	Norfolk Southern Railroad
RDU	Raleigh-Durham International Airport
ROW	Right of way. A corridor dedicated to a specific use such as rail, highways, utilities, etc.
RTA	Regional Transportation Alliance
RTP	Research Triangle Park

SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU). Congress establishes the legal authority to commence and continue FTA programs through authorizing legislation covering several years. This legislation reauthorized surface transportation programs through fiscal year 2009.
TAZ	Traffic Analysis Zone(s)
TJCOG	Triangle J Council of Governments, the advisory planning group for the Research Triangle Region made up of elected officials from Chatham, Durham, Johnston, Lee, Moore, Orange and Wake Counties.
TAC	Transportation Advisory Committee. The policy board for an MPO.
TTA	Triangle Transit Authority. The regional public transit agency that provides regional bus and other commuter resources in Durham, Orange, and Wake Counties. Recently changed name to Triangle Transit.
VMT	Vehicle Miles Traveled

## Appendix I: Bibliography

### *Studies, Guidelines & Adopted Plans*

#### Region-wide Initiatives

##### Triangle Regional Transportation & Transit Studies

- 1986 & 1987, Travel in the Triangle: Trends, Implementation, Choices
- 1989, Regional Transportation Service: Market Analysis and Service Plan\*
- 1990, Research Triangle Transit/Land Use Study
- 1990, Joint MPO Regional Land Use & Public Transportation Action Agenda\*
- 1992 - 1994, Triangle Fixed Guideway Study, Ph. I, II & III.
- 1995, Regional Transit Plan for the Triangle
- 1997, Station Area Development Guidelines for Regional Transit Stations

\*These documents are in the file labeled Triangle Area Regional T & T Studies.

#### Corridor & Area Studies

- 1998, 2001 & 2004, US 15-501 Major Investment Study (MIS), Phases I & II and Corridor Alignment Analysis.
- 2000 & 2003, I-40 HOV/Congestion Management Study, Phases I & II, Summary, Findings and Next Steps.
- 2002, Center of the Region (CORE) Report
- 2002, Regional Rail Transit Project, Environmental Impact Statement (FEIS)
- 2003, NC 54 / I-40 Corridor Feasibility Study
- 2003, RDU TTA Airport Rail Link Feasibility Study
- 2004, Easttrans Commuter Rail Feasibility Study Final Report
- 2006, US-1 Corridor Study

#### MPO Long Range Transportation Plans (LRTPs)

*LRTPs, which are updated every 4 years, have a 30-year planning horizon.*

- Durham Chapel Hill Carrboro MPO 2030 Long Range Transportation Plan (2005)
- Capital Area MPO 2030 Long Range Transportation Plan (2005)
- Draft CAMPO Comprehensive Transportation Plan (underway)

#### Triangle Area Regional Surveys

*Survey data is generally updated every 10 years*

- 2006, Triangle Household Travel Survey Final Report
- 2007, Triangle On-Board Transit Survey Final Report

Charlotte Area Transit System (CATS). *Destination 2030*. Summary of 2030 transit plan. April 2007.

Patton, Zach. "Back on Track. Sprawling Sunbelt cities discover new way to grow." *Governing*, June 2007.

Peirce, Neal. "Sunbelt Transit Story: Lead---At your own peril" *The Washington Post*, August 26, 2007.

Schrag, Zachary M. "Thinking Big. Lessons from the Washington Metro". *TR News*, March-April 2007, pp 18-20.



## **Appendix J: Public Comments and Other Communications to the STAC**

**Public comments were accepted electronically from the STAC website and forwarded from sponsoring agencies. Public comments were also collected and compiled at the STAC meetings.**

### **Electronic comments:**

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Comments: I would like to suggest a stopping point for the future bus system in Wake Forest. I have lived in Wake Forest with out any transportation except my own 2 feet for 4 years. I would like for a stop to be placed at Wait Avenue and Allen Road. Thank you for all the work and commitment of the committee members and vlunteers have done to make this project possible.

----

Comments: Many people from surrounding counties commute to Raleigh each day for work. I am one of many people who drive from Wilson to RTP (nearly 65 miles) each workday. I would love to see a rail system that would expand to eastern Wake county, as far as Zebulon, NC and travel directly to RTP. This way many of us can save fuel commuting.

More research would have to be done, but I, also, believe that a rail system even in Wake County would help the economy in central and eastern nc, as people continue to come to Wake County to find work with higher wages. Many people would like to work in RTP, but dread the drive.

I ended up in RTP after 1 1/2 years of not finding a permanent job in Wilson, but the cost of fuel is making up for the higher pay. My work schedule is odd and I am unable to find anyone to commute with. I would love to save time and money by utilizing a sophisticated rail system.

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Comments: Please, please, please push for effective mass transit in the area. You have my complete support for the rail. Even if you start small, you gotta show that it can work. We need options around here, not everybody on the roads should be driving!! Personally, I have family that doesn't move here from N.Y. because they do not want to be made to drive. I'm a highly educated professional or one that can do a lot in round tables or public speaking, but anything aside from that I offer. If you need to distribute support bumper stickers, wear advertisement on me, or anything, let me know.

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Comments: I live off 401 N / Ligon Mill Rd and drive into downtown Raleigh every day - and hate it. There is no bus route near my home - even though the area I live in is expoding with growth.

I would ride the bus to work if there was a park and ride lot somewhere nearby - like at Triangle Towne Center or a nearby shopping center. I would be more likely to shop there too - so they would benefit. Park and rides are a "multi-win" situation.

Please add more park and ride lots - sooner than later. I bet they will be more effective than some of the expanded bus lines.

----

Comments: I have to admit I didn't read much of the plan; rather, looked at the maps and exec. summary. I have 3 comments and hope they're already in plan:

1. I lived in Zurich, Switzerland in 1985-86. The reason mass transit worked there is because the alternative (auto travel) was awful: Gas was expensive, traffic was awful and when you got to your destination, there wasn't any parking available anyway. My point is that if we all of a sudden have 3 times the bus service we used to have and these busses are caught in the same traffic as cars, it won't be successful. There have to be bus-only lanes, even on 540 and 40 during rush hour.
2. The recent tragic accident at Falls of Neuse and Spring Forest points out that you can't just have good mass transit - you have to make it safe for people to get to/from the stops. I have long thought that the Falls of Neuse/Spring Forest area would be a good place for my adult autistic son to live, since there was good bus service there, but I often wondered how he would safely cross the street. Now I have doubts about this.
3. I don't understand why the mass transit would be paid for by increasing the sales tax. Why not increase the gas tax instead? This provides another motivation for people to give up their cars. I believe this is partially how the successful European model is funded.

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Comments: I was not able to view the plan.

Few would object to a mass transit system that works and pays for itself. The use of the bus if small enough (15 passenger) and able to go to the riders location (variable path) might work. In any event the buses can be sold if not used.

We have to walk before we run. YOU cannot automate an assembly line if you cannot do the assembly to begin with.

IBM's PC company ran into coordination problems when it remodeled with a huge conveyor system. (fixed path or like a rail system.) Production fell to half and Gerstner did what he knew best - sold it.

The coordination is the wait to transfer from car to bus to rail to what ever to get to where you want to go.

The idea of using the personal car on a guidance system avoids the coordination of systems. Maybe the personal car can ride the rails.

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Comments: I'll be very curious as to how the DMU system will terminate at Duke Hospital and be interlaced with the BRT/LRT system to Chapel Hill. When TTA wanted to have it run in front of the Erwin Road garage and possibly even go across Fulton, there was a large outcry from Duke's administration at the time. The main sticking point was the track structure's block of the hospital's main 'money shot' view as it extended over to the VA site.

I'm guessing it could go on the north side of that garage or angle in along the coal/power station spur, but I'd be interested in how it interchanges with the campus transit/circulation system. Either way, it's most likely going to be a destination stop without a park/ride capacity.

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*Note: the following comments submitted by the same citizen*

Comments: if Raleigh wants to be seen as a good business and travel destination, its downtown should be directly connected to the airport via rail transit. I believe the cities that have done this have made their downtowns more vibrant because they are easier to reach and prevent urban sprawl. taxis and buses just continue to perpetuate the oil/gas mentality instead of concern for the environment--you have to reduce the bad air in Raleigh as well as the cars. people from Durham and chapel hill can use park and ride express buses to transport them to the airport to connect them to the rail until the overall system is expanded in future. sounds like a win-win for everyone.

Comments: the system must start with a rail link from the airport to rtp, raleigh and nearby suburbs. otherwise it will be doomed to failure because of low ridership. expansion can later be made to durham and chapel hill.

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Comments: I am so happy triangle transit, and especially rail transit, is being worked on again. Every time I travel from Durham to Raleigh or Chapel Hill for an event, etc., I think how nice it would be if I didn't have to drive my car. Last week I drove to Raleigh in the early evening. Traffic on I40 was at a standstill in some places, people were weaving in and out of lanes to try to advance further than others. Not only was this highly annoying, I cringe to think of the energy wasted and I felt very much in danger.

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Comments: The latest revision of the light rail plan still does not include a stop at the airport! This project is doomed to fail unless you include one of the most widely desired aspects. Public sentiment on this has been consistent. I will not support this plan without a rail stop at the RDU airport.

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Comments: I'm already a fan of this plan! The comprehensive, across-the-board review of the needs of our collective communities, as well as the combined approach to solutions is a job well done. The collectors and the bike/pedestrian access improvements are enticing. I would like to see individual communities carry that ball further and look at local improvements such as bike lanes and wider shoulders or special lanes for bike travel. Any loss of right of way or greenspace would definitely be offset by long-term benefits of a healthier public, less pollution, etc. Thanks for putting so much effort into this. I look forward to hearing more about it. At this point, I would already support a half-cent sales tax increase and the vehicle registration fee increase mentioned.

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Comments: Mr. Cianciolo was correct to state that for this region to be successful, we have to rethink how we grow. I do not believe that so called increased population who are living in the downtown Raleigh Condos would consider riding a bus to Cary. What needs to be done is to control the building. Mass Transit works in Areas where people are massed in a local areas. Raleigh is sprawled all over Wake County. What the public really want is better development planning.

The funding sources proposed, a half cent increase in sales tax and a \$10.00 increase in vehicle registrations is once again screwing the tax payers. We already pay an extra \$5.00 on vehicle registrations for Mass Transit/Bus Service.

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Comments: Please make sure that there is reliable, frequent and direct bus and/or rail service to RDU Airport throughout the day, well into the evening and on weekends. This would eliminate many vehicle trips by local residents.

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Comments: I'm 100% in favor of a Triangle rail service!! I'm from a "railroad town" in NY where driving to the train station and commuting to NYC was the norm, and the sight of hundreds of single-occupancy vehicles on I-40 practically makes me cry! (Speaking of which, why is there no HOV lane or plan for such on I-40 or I-540?? Any incentive to get people to car pool and save gas at the same time is a good thing!) I believe that commuters would LOVE the train, and more would use public transportation if it were more convenient. I know I would.

In addition, I live in Chapel Hill but commute via TTA from my job at UNC to my husband's business in north Raleigh every weekday, and although they seem to do their best it's a long trying trip, especially when there are missed connections changing buses-- more options and more routes/runs would be a terrific thing.

----

EASTRAN did bring up some interesting points into the larger discussion about regional connectivity. Those two corridors (Wilson-Raleigh and Goldsboro-Raleigh) have potential for larger use down the road as long as they aren't encroached upon. Sure there is a new 64/264/540/70 cluster of roadways. But once these reach capacity, there won't be any place to bypass them or enlarge them.

The other linch pin is going to be Raleigh Central Station and it's design. If all possible contingencies don't get thought up, there could be a station structure built that might be obsolete before it's even built. So, the time to do it right is now before any foundations are laid. People think about rail stations in the classic Beaux Arts model of the past. That's all well and good from a nostalgia standpoint; but, I believe the better plan for a future that Raleigh could have is the new Transbay Transit Center being planned for downtown San Francisco. If you haven't taken a look at that, I strongly encourage you to do so. It's pretty cool to say the least...

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Comments: We support a better bus system, including more routes and shelters. I, Price, cannot drive and recognize the need of many to have better transportation. I just moved to Raleigh and am trying the taxi services, but would support bus services if they met my needs.

We support the half-cent local sales tax and \$10 vehicle registration increase. We want to see the quality of life to continue to be excellent in the Triangle. It must be planned for and funded.

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*Note: the following comments submitted by the same citizen*

Currently Johnston County is requiring that traffic engineers estimate a yearly increase of traffic in the 40/42 - Cleveland Area of 9%. I realize that the density might be there at this moment, put a drive through the area to see the continued housing starts, the traffic (NCDOT is getting ready to undertake some major improvements at SR 1010 and NC 42 and Wal-Mart will be making some much needed improvements at the interchange). It would seem to me that if the plan is not going to be fully implemented until 2030 or later, then it would make sense to plan for the growth in one of the fastest growing counties in the country. I think that you will find in the next few years that the Cleveland Area will incorporate into a town and no longer be a hybrid of Clayton and Garner. If nothing else, I would encourage the commission to look at the growth and plan for transit to that area. If you look at where the daily backups start on 40 in the morning and end in the evening you will see the I-40/NC 42 interchange as being the key point.

Comments: I am surprised/amazed at the lack of inclusion of Johnston County in this plan. I would encourage the committee to look at Park and Ride facilities at a minimum for various parts of Johnston County (40/42 comes to mind) with convenient transfers to various parts of Raleigh.

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Comments: Thank you so much for such a sensible plan for transportation. It is so much past time for the Triangle to recognize that building more roads will only detract from the quality of life for its residents. We need creative ways to move people and identifying such high needs area as the airport and rush hour service between specific outlying communities is a great step forward.

----

Comments: I fully support a good regional transportation system as being necessary to support all the positive things currently occurring in the Triangle. I have no problem supporting a 1/2 cent sales tax increase or the \$10 increase in registration fees to fund the system.

I do, however, take exception to the notion suggested in the N&O today (4/2/08) that those increases would be implemented "in as many counties as will support it...". I hope that is an editorial misunderstanding because I for one would not support a system serving any municipality that is not sharing the burden of cost.

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Comments: Please read the paper: We, the tax payers of NC, already live day to day and you folks just want more.

Most buses travel with 10 or less passengers, burn top priced diesel fuel, and 400 school buses can not pass inspection due to necessary repairs; are your buses maintenance free? You complain about pollution yet add to the problem, as there will never be an all electric bus and you wish to use conventional diesel trains. According to the Wall Street Journal; "by 2010 Japan will have their "all" electric cars on US highways." think about that as NC can no longer support "Cost Over-ride's" passed onto the people by State Government. NO MORE TAXES !!!

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Comments: We need this. There shouldn't be any question. The triangle area smoothers in traffic congestion and it will only get worse. We should have the rail system that DC and Atlanta have right now. But as always NC is behind the times when it comes

to progress. We draw in big business and give tax freebies but don't prepare for the cost in the long run. This transit system will not only make getting to work easier it will make life in the triangle better.

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*Note: the following comments submitted by the same citizen*

Comments: I have looked at your maps and your goals for the year 2035 which is 17 years away is very short sighted. As cost of land increases in wake county more and more people are moving to johnston county, harnett county and vance county. You have show a DMU rail and light rail in the raleigh and chapel hill areas only. This rail system should also extend down existing rail into Apex and Fuquay with Bus service projected to extend to Lillington and Angier (harnett county). Rail should also be extended to smithfield or selma along the existing track or proposed double track with stops in Clayton. Also rail should be considered as far North as Creedmoor and as far west as Burlington. You have looked just inside of Wake/Orange County for rail system but the fact is that many of the people commuting drive from much farther. The chance that someone would take a bus 20 minutes to a rail station in downtown raleigh to sit there for 15 or 20 minutes to catch a train to Cary, Durham or Chapel Hill isn't going to work. It will be inconvenient, and if the bus is delayed in downtown Raleigh and misses the initial connection the passenger will have to wait an additional 20-30 minutes and by this time they could have already driven to cary, durham or RTP. Outlying bus service to some parts of harnett/johnston/vance/chatham counties is foreseeable but the connection to commuter rail should be made inside those counties limiting the number of buses on the road. The DMUs can carry far more passengers faster and cheaper per mile than a bus that will sit in traffic on I40/70Hwy/I-85 or 15-501. Commuter rail was originally projected to be up and running by 2003 and now it's 2008 and nothing has even been started except track upgrades on the existing NCRR lines. It's time to truly look to the future. This proposal is just as shortsighted as the ones that the Wake County school system put together. You need to look 17 years down the road and see where the people will be truly living. While some will be living in Wake County a majority will be moving out of wake and into the more rural counties. This will bring about a need for commuter service and while buses are a stop gap measure now, 17 years from now you will be looking back wondering why rail wasn't put in place sooner and you will be scrambling to find the money to build the infrastructure. It will cost us less if we do it now than wait until 2035 to bring about broad sweeping changes. Go ride the virginia railway express or Washington dc metro or amtrak in the NE. In order to be on time, to create ridership that is profitable you are going to need rail lines that can be free of freight traffic during rush hour periods. This transportation plan falls short of what the area will really need by 2035.

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Comments: I read through your appendices and while the facts are interesting, you don't talk about the extra cost that taxpayers will pay by delaying rail projects until long after the 2035 date. 2035 is 27 years away and every year that plans are in the environmental impact/design and build phase we are paying more in fuel, in cost to purchase land/right away areas etc. Your plan basically leaves out the southern part of wake county. I realize that years ago the track between apex and fuquay was abandoned but just as the building of 540 has shown if it's not built initially you will never see it completed. The taxpayers built 540 for the wealthy in North Raleigh, you even expanded it to Knightdale. All the while the southern loop hasn't been built and probably won't be built to help those of us in the southern part. Traffic in knightdale is no worse than it is in Apex and Fuquay

yet due to political considerations they got their 540 connector. Now with this "comprehensive" transportation plan you are once again looking at ways to make commutes from Wake Forest and points North easier. If you look at the number of people in Wake Forest it was estimated that in 2006 they had roughly 22,651 residents. While Apex had an estimated 30,208(2006) residents, Fuquay had an estimated 13,669 and Holly Springs had an estimated(2006) 17,425 residents. So you are looking at improving trackage to wake forest for 22,00 residents, but you will have mostly bus service to approx 31,000 residents (Fuquay and Holly Springs), with the possibility of rail service to Apex of roughly 30,000 residences. So in 27 years you don't think that these three towns will deserve rail? The quality of your research and your numbers are questionable given that in 2006 number the area between Apex and Fuquay is almost triple that of the population of Wake Forest AND you have also propped rail service to Selma which has a 2006 estimated population of 6779 residents. Clayton had an estimated population of 13,842 in 2007 and smithfield had a 2006 estiamted population of 12,271. So combining those you have approx 33,000 residents compared to almost 60,000 in the apex,holly springs fuquay area currently, yet we are going to spend our tax money to provide expanded rail service to half the people we could (at today's figures)? Doesn't make good economic sense if we want to reduce traffic and congestion. NC 55 is a nightmare at rush hour just like I-40 is, US401 to Fuquay from Raleigh is a nightmare during rush hour, yet your research sends our precious resources somewhere else. this kind of logic and planning is the reason we have the I-40 mess we have now, this type of planning four laned chatham street in cary only to run into two lane streets downtown backing up traffic at rush hour. It's time to stop using failed federal models and start looking at real world problems. The rail system was already supposed to have been in place by now, if we had spent our money on that rather than on 540 we would have been much better off today. Looking at your statistics of 4 peaks trains carrying 1800 passengers a day or 6 lane highway carrying approx 1600 a day, the math is simple. You can move people more efficiently by rail. You talk about the cost of operation and it paying for itself as a consideration for rail. Why? We don't have the same considerations for roads. They cost us tons to build are routinely over budget are a constant source of maintenance and can you say exactly how much tax money comes in because of a particular road? Not definitively. You can guess or estimate, most people never moved to the area for a road. But commuter rail could infact convince people to move and/or spend their money here if they were moving from another city, didn't have a car, etc. If you build a road you build it for a percentage of the population. Please open your eyes and take a look at a real future need and not a model.

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In regards to your comment that the committee looked at concerns other than regional ones that just isn't true. If you will look at the report the commission put out it favors areas thta had direct representation on the board. It provides commuter rail to all of the areas which had a representative even to a low population area such as Chatham County when areas such as the Apex, Holly Springs fuquay corridor already have more people. You even have rail extending into Johnston county. If you look at current population estimates for the year 2006 you will see that Apex, Holly Springs and Fuquay each have more citizens than Clayton, Smithfield, or Selma. You even have rail to Wake Forest which is a low population area. Given the current water shortage this past summer and the projected forecast that the drought won't change anytime soon, your forecast of continued growth in the Raleigh, wake forest and Clayton areas are flawed. The watershed in which they sit along with Durham County suffers greatly in the current drought projections. During this time the watershed that Cary, Apex, Holly Springs and

Fuquay and even Harnett County is in fared much better and over time will be a target for more growth in the future as the building will go where the water can sustain the houses. Your commission is using outdated models that have created traffic jams such as the one we currently see on I-40,US1 and also on US 401 between Raleigh and fuquay every morning and afternoon. Such nearsighted planning will eventually cause a transportation nightmare that our kids will be forced to contend with because planning wasn't done properly. The 27 year plan put out is lacking in almost every regard. If we more than double the population iin the area from 1 million to 2.5 million the small rail system that the board has designed won't be enough to handle the amount of commuters on a daily basis. We will see traffic much like Los Angeles experiences every morning unless we truly think for the future. This thinking includes having everyone involved in the planning from the beginning and not just having them ratify something a committee has come up with. Everyone from all jurisdictions needs to have their say in the plan and there are several towns that currently being left out. Harnett County needs a representative, apex,fuquay, and holly springs needs representatives and remove some of the folks on the board that are duplicating geographical needs such as several reps from the raleigh and cary areas. What you have is a system where the small towns have no voice yet they have to pay for the needs of Raleigh. This is the same situation that built 540 in Northern Wake County yet now they want to turn the southern part into a toll road and make those south of raleigh pay not only for the northern section but the southern section as well while the wealthy in the nrothern part of the county get a free ride every morning. You have ignored the people for long enough and it's time to change the panel so their is some balance. Will you do it? Probably not because you are looking after special interests and not the well being of the communities as a whole. I challenge you to listen to what everyone wants and not just the city of Raleigh and Cary.

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I went back and looked at your map and it does appear as though I mistook some of the outer lying bus routes as train routes. My concern is this. When we more than double our population in the next 15-25 years where are the cars going to go? We will have traffic the likes of Los Angeles at rush hour. We can't keep covering every inch of ground. Every acre of ground covered to build a road is potential revenue that is lost through lost land tax, sales tax if a business were to locate there or lost taxes from houses. Have you ever traveled to Washington, DC and rode on the metro there? How about the Virginia Railway express? I urge you to travel there and spend some time riding these systems. They allow millions of people every year to both commute to work and to visit washington, dc without usiing a car even once. Washington, DC is too crowded to drive in every day, that is why we need to look to the future. I-540 was supposed to have been built by now and as the way things look it won't be built for at least another 15 years in the southern part of wake County. I am against toll roads for one part of the road and not having toll roads on all of it. My tax money was used to build the northern loop and they get to ride for free every morning, I should get the same consideration. If the mismanagement in our state government was fixed we wouldn't have a budget shortfall in the NCDOT. Many years ago we approved many road bonds, while that money may have been used for roads much of the money in the DOT's budget has been moved to balance our state budget. representatives pork barrel projects such as roads that ultimately go nowhere cozst us millions and delays in road projects and improper inspections of roads being built also cost us billions. Your commuter plan while admirable falls short for several reasons. Expanded bus service whil reducing some cars on the roads adds buses to the roads. While they are better than 25 cars (for each bus) being there they are simplay a stop gap measure. To move the projected 2.5 million



people efficiently especially at rush hour you need a service that isn't limited by traffic. The current TTA bus schedules don't attract riders because it doubles commute times. For example if one gets on the bus at Apex to travel to the RTP area, you have to be on the bus by approx 0630 in order to get to work by 0830. The same route driven in a car takes approx 55 at rush hour. this takes into account that one has to get to the TTA station in RTP and transfer to a bus that will go by your workplace unless you just happen to work within walking distance of the bus terminal. Now if you want to spend quality time with your family (which is why you don't live in Durham county to start with), you can spend the extra hour each way with your family and drive or you can spend the extra hour on the bus. Most will drive. If you want people to ride the bus make it expedient get people to their destination in a reasonable amount of time. 2 hours versus 55 minutes isn't reasonable. If you doubt what I am saying look at some of the bus schedules. Your commuter rail system is designed to support one small corridor. It seems to go from RTP to morrisville, cary, then raleigh and then North to Durant road. As it is currently designed it will be a failure. even using buses to supplement riders a person would have to take a bus to the station wait to catch the next train, ride it to the rtp depot, then catch a bus to there stop. metro in Washington I can get to just about anywhere with 1 transfer. each transfer you make in a system in potential risk for missing the connection due to traffic delays and having to wait for the next train or bus. If you miss one connection coming home in the afternoon you could potentially be left at the RTP depot needing a ride home. You have left out the Apex, Holly Springs, Fuquay areas in terms of rail a fast train from fuquay to holly spring, to apex to rtp depot would cut traffic on NC55, US1, and 751. They would have to make one transfer, now you have them sitting in buses stuck in traffic on NC 55. People in North Raleigh can drive east to durant road and catch the train only to travel south and then west through raleigh and then to rtp. For them the commute is 35 minutes via I-540 or possible 1.5 hours or more driving east to durant and capital and then riding the train back through raleigh. You have bet the farm on basically one route to move 2.5 million people in the area. A route that currently has no connection at RDU and has no connection in southern wake county and no connection on Leesville road. I am sure you have heard the old saying. If you build it they will come. Well if you build it poorly not only will they not come, it will fail miserably. You have to make riding not only convenient but competitive in means of time. Commuter rail will never make money (roads don't make money either), but they can make life more enjoyable by leaving us more open space for parks, houses, businesses etc. Put a 6 lane road over everything and what do you have? Concrete, no tax revenue coming in, just expenses going out. Commuter rail at least brings in revenue to help offset some of it's costs. There are several rails to trails areas that are underutilized that could be converted back for commuter rail. The land is there it's not being built on. Ask yourself why people in Los Angeles continue to sit in traffic every day rather than taking buses or rail? because it's not convenient. If you want someone to drive many miles to a train station or take a bus many mles to a train station, then when they get off the train they get on another bus they won't do it. Let's try to think of PROACTIVE ways to fix our transportation problems. build a rail infrastructure that is both expedient in terms of time and convenient for our commuters. That would then leave the highways for emergency vehicles to get from point a to point b instead of being stuck in traffic as they are at rush hour now. The transportation recommendations in your outline fall far short of what we need. When 2035 comes you will probably be retired and your kids and mine will be paying the price for lack of vision.

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Comments: Express buses and park and ride should be implemented from Raleigh to Wilson and Rocky Mount and rail to Selma and Goldsboro. So many people make the commute driving their own cars.

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Comments: I do think our area does need some form of a mass transit system in place in the near future. Believe that we do need to get going on this project because if you think of the time any transit system is in place up and running it will be in 5-10 years which our area will be overwhelmed with traffic jams. A mix use transit system as what is in Salt Lake City or Charlotte will work very well in our area. Also I think to promote nightlife downtown and with the new apartments along with condo's downtown a safe transit system should be in place so people can get around and not have to drive after drinking a system similar to Charlotte that runs 24 hours a day. Overall the issue comes down to money and we all know that is tight in these times. I do think that no matter what we need to begin now looking at a transit system before there is no land left in our area to put on in place in the future. This is something that I feel strongly about living in Raleigh area for the past 13 years that we do need. Its one of those things that if you build it they will come. Just have to be willing to take the risk and know nothing is perfect but we do have to do something.

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Comments: I'm sorry, but, 38 people and all you can come up with are buses, light rail, and heavy rail? What century are you planning for, really?

You do realize that buses won't work, right?

That many people believe the bus has a social stigma in this area. That the area is too sprawled out to make buses effective: run often enough to make me happy and your costs will be through the roof.

You do realize that a single track of heavy rail isn't going to do much for us, right? It doesn't even go to the airport. It doesn't spur in RTP and go to CH. One little track zipping back and forth is a gimmick.

You do realize that a Tobacco Road light rail is pretty much the same gimmick, right? Only now you have 2 bits of incompatible technology comingling.

This isn't DC, NYC, or Chicago with a well developed city center, and these old-school suggestions are going to wallow in disuse (assuming your blueprints don't die in committee). People head in many directions and have an expectation of a fast point to point trip.

Offer something new. Offer us point to point for the 80% of the travel we want. Do it 24x7 for the night owls and drinking crowd. Do it securely so we're not creeped out about being around a bus station at odd hours. Do it without being petroleum dependent on 2/3 of your big ideas. Do something that the rest of the nation would look at and go "holy CRAP that's cool."

<http://www.unimodal.com/>

No affiliation.

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Comments: I agree that a system needs to be put into place to ease congestion, but I do have a problem with increased taxes and automobile registrations, statewide, to pay for it. I do not live in the Triangle are, but do visit the fairgrounds, and some of the other area attractions, periodically. While I would be willing to pay a toll fee on some Triangle roads, I would be very upset by a blanket tax, or fee increase, that is in place to pay for something that I only use once a month.

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Comments: Regional rail needs to be a priority as an alternate means of travel, preferable a quicker means. A bus sitting in stalled traffic is not a viable alternative, just as the current TTA buses are not a true alternative as they utilize serpentine routes and require users to devote additional time to use them. Also, we need to ensure we do not segregate our regional rail into differing systems requiring unnecessary transfers along the route. Mass-transit systems must provide an alternative that is less stressful and a more pleasant environment than sitting in future traffic congestion.

As for bus service, we need to incorporate vehicles that appear inviting, avoiding the current rolling billboards such as Raleigh's buses that provide a unpleasant throwback to our childhood school bus.

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Comments: I am surprised/amazed at the lack of inclusion of Johnston County in this plan. I would encourage the committee to look at Park and Ride facilities at a minimum for various parts of Johnston County (40/42 comes to mind) with convenient transfers to various parts of Raleigh.

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Comments: I would just like to point out that one solution to the isolated location of the RBC Center (as pointed out during the NCAA tournament this year) is simply to place a mass transit stop at the RBC Center connecting to other Triangle entertainment locations, ranging from downtown Raleigh to downtown Durham and Chapel Hill. This can relieve the pressure to develop all of the open land around the arena.

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Comments: I live in downtown Raleigh near NCSU. I would love to be able to take the train to Southpoint to shop, to Chapel Hill to eat or attend UNC events and to Durham to attend the American Dance Festival or programs at Duke or to enjoy restaurants on Ninth Street. I would even prefer to take a train or trolley to downtown Raleigh in the evening. I appreciate your efforts to make public transit more available. I think of the Philadelphia SEPTA as a good model, although their trains don't run after midnight, making late events a problem. It also would be great to have an easy way to get to and from the airport without many transfers when luggage is involved.

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Comments: I have long been a proponent of passenger rail service, and have also thought increased rail service in the Raleigh area would significantly help to relieve vehicle traffic congestion in the Capitol City.

That being said I am a vigorous opponent of expanding city bus systems. In my opinion

buses should only be used as a last resort to connect rail terminal/stations with other key transportation hubs.

I have long thought that making use of existing rail lines would be the quickest and cheapest way to get an intercity rail transit system started in Raleigh. However, from articles I saw in the News & Observer, I understand the railroads are saying that their lines are too busy to share with a intercity transit service. Perhaps on the line that runs between the main rail yard in downtown Raleigh out to Cary, this may be true. That would necessitate a new parallel track being constructed, along side of the existing tracks between the rail yard and state fairgrounds.

Then I suggest that as the line nears the beltline, that a new line branch off cross Hillsboro Street, cross the corner of Meredith College Campus then cross the beltline, then cross Blue Ridge Rd. then cross the back side of the Fairgrounds, proceed on to in front to the RBC center to a terminal, as a first phase in establishing rail transit service -- using self powered diesel units only - no electrification. I personal don't believe that electric trains are worth the extra construction expense.

This first phase I am proposing to you, would serve the RBC center, the state fairgrounds, Meredith College, NC State University, and get fairly close to downtown Raleigh, with a station very near the existing Amtrak Station.

As second phase, the line could be extended along side of Wade Ave / Interstate 40 until it nears the RDU airport then veer away from the Interstate over to the Airport property with a station constructed right on Airport property, or use an exist building at the Airport like Terminal C. Then the rail line would continue westward and rejoin the existing rail line at or near the IBM Campus in RTP. This will permit passenger rail service between Durham, the RDU airport, and Raleigh.

As for the area south of Raleigh, perhaps the norfolk & southern line that goes south to Fuquay, is lightly used enough that they may agree to rent track rights. If so you could have a south bound rail service established very quickly. Establishing service to the Wake Tech Campus should be a high priority. The existing tracks pass within a few hundred feet of the backside of the Campus, all that is needed is a by-pass route laid off the main line coming up onto the back side of the Wake Tech Campus and the construction of a simple rail stop on Campus -- purchase of appropriate rail cars, then you are in business.

These are of course my ideas, but I hope you could see fit to give them thoughtful and fair consideration.

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Comments: The Triangle Transit Authority seems to be stuck in an "If we Build it They Will Come" mentality by continuing to plan around a rail right of way that serves no current need. That is why they could not prove enough ridership to gain Federal support. As a daily commuter on I40, it seems obvious to me that huge real mass transit needs exist along Hwy 70 and I40 with traffic coming into the RTP area from Johnston County and from downtown Raleigh via Wade Avenue as well as along Hwy 64 from eastern Wake County. If TTA would build an express bus or rail system using those existing roadway corridors with good parking facilities and shuttle networks along the way, I expect tens of thousands of commuters would gladly support it.

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Comments: I remember that the Feds turned down funding of the light rail because they said it didn't serve enough of the community. Has Anybody given any thought to Running a Lite Rail System along the 540 corridor? Serving the Knightdale, Clayton-Johnson County and Points West Like Fuquay, Holly Springs in a Loop with Connections with RDU,RTP and Durham I'm sure the land is already appropriated for 540 and it would serve more communities than just the Proposed Raleigh Light rail. Thus opening up to a more favorable Federal review.

It could be a More Disney Monorail-ish System Being Lighter and less obtrusive and at the same time More modern and Serving Many Many more Cities

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Comments: two things that are missing:

1. a direct rail link from the airport to RTP to downtown Raleigh (see Atlanta, Washington dc and nyc for examples) is the only way to get enough ridership to justify the expense and to keep polluting vehicles out of raleigh. it won't work unless you do this (see buffalo who didn't do this). connecting chapel hill and durham should only come after the above is accomplished.
  2. trolley cars (electric) replacing the buses to cut down on oil usage, pollution etc. (see Philly). I think people will ride trolleys more than buses because they are so unique.
- my 2 cents

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I attended the meeting on February 29<sup>th</sup> finalizing the STAC Regional Transit Vision Plan as a private citizen and (unofficially) as a member of the Durham Bicycle and Pedestrian Advisory Committee.

I want to commend the Special Transit Advisory Commission for its work and will urge the community to adopt the financing strategies -- including an addition to the sales tax -- necessary for the implementation of these needed improvements.

The plan is very sound and will enhance the area greatly.

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I've been following the TTA and now the STAC in their plan to expand transportation alternatives in the Triangle. As a regular traveler and user of local transportation alternatives, I've had some experience with using systems that connect an urban core to a major airport. Yes, it's nice that Atlanta, Cleveland, Philadelphia, Baltimore and San Francisco have direct one-seat options to connect from the airport to the urban core. But, yet I've just gotten done using Newark and JFK's AirTrain systems which offer connections to existing transport infrastructures. And, the local population seems to be taking to them rather well.

So, if RDU doesn't want to be directly on the link, it may be okay since the cost of doing it all at once may be more costly than what the taxpayers of the Triangle are willing to invest. I know in a theoretical discussion a transport novice may say they want a one-

seat ride to the airport, but they don't have a clue to actually making it happen. Simply put, RDU is off the major transit axes between the urban centers in the Triangle.

It might be wiser to have a separate airport service that gets people around the parking lots, terminals, rental car lots and rail transport hubs anyway. I can think of what Newark, JFK and Dallas have done or are planning to do as a way to offer an incremental approach/compromise which satisfies all of the stakeholders in the discussion. And, if it's built in such a way as to allow a more direct link down the road, then all the better.

RDU is going to have to do more to upgrade its physical plant to allow a rail-based transit access. From where they are right now, it's either going to have to be on the roof like Dallas or Newark or underground like Chicago/O'Hare. I imagine that when it comes time to demolish Terminal A as well as the old Terminal C garage the opportunity to build an underground access point might be possible. But, yet I also can envision an elevated loop connecting the outlying parking/rental car lots.

Just my \$0.02 worth of opinion. Take it or leave it.

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I am a North Carolina Train Host volunteer. Once a month I ride the Piedmont from Raleigh to Charlotte and back. My job is to promote rail travel, make sure riders are comfortable, assist them, answer questions about rail travel, etc. On my last ride, March 7th, I decided to take the "Lynx" light rail train. WOW, WOW, and WOW! It was an enjoyable experience. The cars were comfortable, clean, and frequent. AND, this was in the middle of the day, there were riders getting on and off at every stop. Most stops had at least three to four getting on or off.

This area is growing at a fast pace so if we don't establish a light rail system, and soon, we will forever be behind the traffic eight ball. It can work, and it will work. Our congressional representatives need to put the proverbial "squeeze" on those in Washington who have contributed to the delay in moving forward. I read where other towns and cities similar to Raleigh are getting the funds and establishing or increasing their light rail systems. It is now our turn.

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Comments: I sent my thoughts to the DCHC MPO and was directed to you. I just can't let the possibility of SkyTran transportation idea drop. If I'm way off base I'll let it go. But it seems to me that this could solve many of our transportation problems and make Durham and the Triangle a much more wonderful place to live for people of all socioeconomic levels. It's a LOT cheaper than rail, applies more effectively to a dispersed population, and we'd be able to put a line to the airport!

Please forward this to whomever might have an interest or the knowledge to either act on it or drop it. If the latter, I'd love a return email to inform me as to where my thinking is off in this regard.

It seems to me that Durham has just the right mix of new investment and consciousness to make this happen - the next city in the nation to adopt a

sane system and start the trend.

I have a pdf on the SkyTran transportation system as well as a generic letter they put together for promotion which I can forward to you if you respond via email.

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*[Note: following series of messages submitted by same citizen.]*

Comments: Hi, how are you. I'm David McDowell, 31, and a Raleigh native. I've lived here just about 100% of my life and continue to enjoy the area. However, the recent NCTA issue regarding the potential for tolling has really upset me. I feel the NCTA was given specific roads to toll and NOT given the freedom to do what was right, which was to study NC and decide where and IF toll roads would even be a viable alternative for NC.

Now we have this newly created STAC. You were all appointed just as the NCTA Board of Directors was appointed. All of them got the job due to the political ties and positions of "importance" within NC. My vibes regarding that are iffy at best. I am curious where the members of STAC came from. Are you are regular a citizen as myself who has no political ties, or are you friends to those who appointed you and are thusly charged by some predetermined outcome that you must work towards to satisfy those who appointed you? I presume someone such as myself would have no say or ability to become part of STAC? What is involved, what are you members doing on a day to day basis? Are they also holding day jobs as well as doing STAC?

I am a HUGE supporter of a regional rail system. I find the TTA's plan a bit flawed, connecting 2 central downtowns?? As you well know, mass transit works best when you take people from their homes to their work (or other travel destinations). Why DMU's? Cost alone? I understand our region may not have the best bedrock for a subway system to be considered (I could be wrong and hope I am), but at one point there were even discussion of a monorail system connecting the Triangle region. Presumably this would be like those at Disney (FL) or even better, utilizing maglev technology. Although the cost of this technology is significantly higher, it will certainly become more popular and the most efficient and comfortable way to travel by train. It is also the cleanest and most quiet, although where the power is actually supplied from for a maglev system, I'm not sure the environmentalists involved. Not only do I support mass transit, but I'm also a bit of an environmentalist!

While very displeased with Mayor Meeker and CAMPOS' vote (minus Apex Mayor Weatherly who I support 100% in his opposition of tolls) to go ahead on tolls, I am pleased Meeker is aiming to replace parking garage lighting with LED fixtures. Some things done right are amazing, that lighting initiative is wonderful. Some things done wrong are worse than wrong, making any part of I-540 tolled is ridiculous.

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Senators, Representatives and members of STAC:

I hope you are all staying cool and healthy during these extremely hot days! I just wanted to take a brief moment of your time to let you know the No Tolls on 540 website (<http://www.notollson540.org>) has completed a major revision. The purpose is to make

sure it is clearly posted why we are against tolls on 540 and that we are also offering up alternative ideas for you to consider to raise funds to build free to drive roads... roads without tolls. Points to look at are:

Stop raiding the Highway Trust Fund, apparently close to a \$1.2 billion budget surplus, however, we claim there is no money for NC DOT to build roads?

Raise the gas tax ever so slightly to keep up with inflation - if we are going to regain the title of the "Good Road State" and continue to be #2 in the nation for most miles of State maintained roads, the infrastructure to process this increase \*already exists\*. Creating the infrastructure to maintain the NCTA will be far more costly than you can imagine.

Pressure the Federal Highway Administration to make good on their promise of \$0.92 on the dollar we give (as NC is a giving State).

These are just a few highlights, there are more ideas on the website.

Thank you for your time. We'd appreciate any feedback and discussion.

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Senators, Representatives and members of STAC:

Seeking the "privitization" (also known as "public private partnership" in jest to make it appear less evil) of toll roads will not help NC. In short, privitization of our roads is bad. The public interest and control of our transportation infrastructure is lost to investors who only seek to make profits. The quick upfront money looks good, but privitization harms the long public interest. The problems are compounded further by excessively long term contracts. Even in a state already well-known for its tolls, Governor Jon Corzine (NJ) stated on 6/28/2007, "New Jersey's roadways will not be sold, and they will not be leased to either a for-profit or foreign operator." We encourage you to NOT allow the NCTA to consider this option for building toll roads in NC. And obviously, we don't want toll roads anywhere in NC, particularly No Tolls on 540.

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Hi. I wrote you folks some time ago through this web form and have yet to hear back from anyone. My name is David McDowell, I have been leading the No Tolls on 540 effort and am EXTREMELY interested in where the commuter rail future is for Raleigh and the Triangle. I asked questions about how the people for this group were selected, how someone like myself could participate, etc.

I'd like more information. Please contact me at [notollson540@gmail.com](mailto:notollson540@gmail.com). If I finally do get some positive interaction going here, I'd be more than willing to use a more direct email account that isn't tied with the No Tolls on 540 effort for communication. NO communication at all is not a good way to make friends in the community through which your group is making decisions for! :)



*(Note: George Cianciolo sent a response to Mr McDowell on his question of how STAC members were appointed; Ann Hartell responded to his question about involvement. Follow up email from McDowell below.)*

I appreciate finally hearing from someone. Sounds like your group might need more than 1 person doing PR and checking the webform emails?? At any rate, I appreciate the information and am glad to hear the meetings are open to the public. As I just recently saw on the news, NC is ranked 5th or 6th in the nation for congestion on roads and with predictions of NC being the 7th most populous state in the near future, we certainly need some correct and NON POLITICALLY AGENDA DRIVEN DECISIONS made. I fear the worst when it comes to the relationship between the NC Legislature, NCDOT and recently formed NCTA. Those happenings are shouting "I scratch your back your scratch my back" through lobbying and being friends with each other in their little political circles.

At any rate, I know toll roads may be unavoidable, however having portions of 540 as a toll and other portions not simply needs to be avoided. Building a new Currituck bridge, OK, I can see that as a toll. For rumors of tolling on I-95... building a completely new 8 lane corridor?? That is just ridiculous. Toll at the border of VA and SC on the current highway. You will have minimal impact to locals who use the road daily, only impacting those who may live and work on opposite sides of the border. Use the toll money on I-95 maintenance and improvements. This allows the NCDOT to distribute funding to other roads as the tolls would then cover I-95. Let the largest through traffic corridor on the East Coast pay for itself so other NC roads, like 540, will not require tolls!

No pun intended, but I really want to know how regional rail is going to get back on track. Rail needs to move people from outside in and back out again, from home to work to home again. I have always failed to see how connecting 2 downtowns, in the TTA's original proposed plan was ever going to be successful at people moving. They don't call it "mass transit" for no reason! :) It's a real shame the RDU Airport Authority and transportation groups were and still seem to be on completely different pages. If 10 years ago they were smarter, RDUAA wouldn't have spent an extreme amount on parking infrastructure and would have participated in having rail come to RDU, which I believe is a major component to a successful regional rail project. Also, someone \*HAS\* to decide, what is central? Maybe I'm biased being a Raleigh native, but Raleigh \*IS\* the capital city of NC. :)

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No Tolls on 540 has been patiently waiting for STAC's reports and recommendations to be released and have noticed you in the news the last couple of weeks. Have these reports and final recommendations in fact been released? Interestingly enough, STAC has managed to avoid any news shared with the possibility of tolling part of the I-540 loop and HW 147 extension. Are STAC's views on toll roads included in your recommendations? If so, what are those views? If not, why would a special transit group avoid this major piece of the transit puzzle?

Also, aside from the toll road issue, I've personally been following the news being released about what STAC has been up to. I'm excited that you do support some light rail systems in this area. However, I'm very concerned about the reading I have seen so far. According to the N&O, there is a suggestion for an electric light rail similar to

Charlotte's between Durham and Chapel Hill, yet, for the rail in the Raleigh area, diesel units. My initial reaction, literally is "DUH!?" This region as you know will one day be one mega-complex. Why would we want to support two distinct types of rail systems? It would seem that if all of the regional rail ran on the same style system, support, maintenance and system interchanges would be a much simpler to achieve. If you have multiple different styles of rail, you have to train staff differently, staff from one maint. shop can't work at the other, spare parts interchanging between rail cars, etc. etc. etc. I think you see my thought process here. So why would STAC recommend 2 completely different systems when the Triangle should have 1 cohesive transit style and branding? Of course, if the N&O reports are wrong, then great, 1 style of rail for all the of the Triangle is great!

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Let's put this scenario in place. STAC is being praised for its work. Somehow you are able to rally the public around a 1/2 cent sales tax increase, \$10 increase on license tags, etc., all measures through which to use the local population to raise a large portion of the money for the rail and bus projects to go forward. All the while, the NCTA is allowed to continue its plan to put tolls on NC-540, 5 miles of FREE to drive road as the Western Wake and Triangle Parkway projects are allowed to continue as toll roads. The section called NC-540 should be I-540, but was renamed to avoid tangles with Title 23 United States Code Section 129 on Tolling Agreements. So, the NCTA is doing everything in their power to keep their operations under the radar so public opposition doesn't have time to gain traction. If they are able to succeed in this endeavor, one day people who have been driving a road for free will suddenly find it tolled. If the public hasn't woken up yet, that will be the death nail. You have a free to drive road suddenly tolled AND then you are asking people to pay more taxes and higher fees... for what? Why are we going to pay more taxes when we just got slapped with a toll road? Why wouldn't this money also go to ensure that I-540 is a free to drive loop? This is an area of serious conflict. It simply doesn't jive.

Am I coming through clearly? I believe there is potential for nuclear sized destruction of all the work being done and it's staring us in the face. The warning signs are there. I eagerly await STAC's view to this scenario.

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I'm ready to toot my horn about the toll road vs. STAC asking taxpayers for more money on [notollson540.org](http://notollson540.org). That's going to create a few waves. The last time Bruce M. did anything for WRAL was based on my tip-off about the removal of the TW Alexander and 2 mile relocation of the Davis Dr. exits and how that will affect traffic and people's perceptions of what already exists. I'm ready to bring this issue to light. I'd like STAC's views, though I'm not sure I want to wait until your meeting later this month. The public needs to know about these concerns.

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I am very sad to hear that STAC is very hands off when it comes to 540, obviously No Tolls on 540 believes the NC Turnpike Authority is NOT the answer. The 540 loop will

be central to vehicle transportation in this region, which is part of the Triangle transit infrastructure, the very infrastructure I understand STAC has been working on. The money that STAC is proposing for locals to pay in higher taxes and vehicles fees could easily include paying for 540 and 147 as well as the future rail and bus projects. Adding 540 and 147 would also increase the validity of the proposal as a whole in the eyes of the public. Paying higher taxes AND tolls combined is a poor outlook for the Triangle commuter, whether driving or taking public transportation.

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Just about one year ago, CAMPO and various others gave a nod for the NCTA (Turnpike Authority) to move forward with their proposed toll roads, believing the NCTA's statement "toll road or no road". A LOT has changed in just one year. Disturbing facts about the NCDOT financial miss-management have finally become public news and candidates for Governor of NC see transportation overhauls as part of their challenge. STAC (in the Triangle area) was formed to look at our transportation future and Raleigh, NC banned Garbage Disposals. (My apologies Mayor Meeker, that's a stab at your account, but I hope I got some laughs.) Everyone is greatly appreciated that you and the City Council stood up and admitted that mistake and have reversed that ban.

Toll roads in NC are also a grave Mistake. No Tolls on [540.org](http://540.org) encourages CAMPO and all involved to reconsider your support of the proposed toll road in the Triangle area now currently known as the "Triangle Expressway". We ask you to reverse your support of toll roads in the Triangle and NC and open your eyes and ears to the reasons and suggestions for solutions:

1. NC is/was the "Good Road State". Encourage the NC Legislature to NOT approve the GAP funding the NCTA is asking for and NOT allow a public/private partnership (a private investor wants nothing more than Return On Investment, otherwise known as Profit). Allow the NEW Governor and his new administration to tackle our transportation needs head on. Don't allow an outgoing administration to leave us with the poor decision of allowing toll roads. We want to retain the "Good Road State" title do we not? Let's not become another "Toll Road State".
2. NCDOT Overhaul - As mentioned above, task the new Governor and his administration with this challenge. If not mistaken, there is an equity plan for NCDOT funds in NC, meaning rural areas get the same funding as populated areas. This leaves us with large, 4 lane highways where populations are staggeringly low, while other 4 lane highways where populations are exploding can't handle the traffic load. Put the money where the need exists.
3. STAC (Special Transit Advisory Commission) was charged with looking into our transportation future. Their proposed plan and draft report - nothing but rail and buses. Are roads not also part of a transportation infrastructure? STAC wants to ask Triangle area taxpayers to approve a half cent sales tax increase and an increase on annual vehicle fees to pay for their proposed rail and bus plan. All the while, we have a toll road built on \*part\* of a loop? So CAMPO is going to allow us to be faced with the potential for Higher Taxes, vehicles fees AND tolls? Why doesn't the STAC plan include the I-540 loop and NC 147 extension to allow for the higher taxes and vehicle fees go towards completion of those roads without tolls? I personally support mass transit, BUT let's have a completed TOLL FREE I-540 loop and NC 147 extension BEFORE we build rail. Those completed roads will drastically change regional traffic patterns.

4. Senate Bill 1381 -

<http://www.ncga.state.nc.us/Sessions/2005/Bills/Senate/HTML/S1381v6.html>

Remember this? The currently open section of I-540 (now called NC 540) that runs about 4-5 miles from I-40 south to NC 55 in RTP was built and paid for with our NC tax dollars and other funding. Senate Bill 1381 allows this section of highway to be converted to a tolled road, law specifically changed in favor of the NCTA and shady by design in the eyes of the public. That's also a double dip on taxpayers and should NOT be allowed. We have already paid for this section of road. Maybe the Garbage Disposal rule fits here for the Senate?

5. End the Highway Trust Fund transfer - this is already being discussed and proposed to be phased out?

6. Double all traffic fines and penalties - If not mistaken, currently (by NC Constitutional law) 100% of the money raised in this fashion goes towards education. If these fines and penalties are doubled, 50% could go towards education, meaning education gets the same amount of money they are already receiving and 50% could go towards transportation funding. Education funding is not harmed and transportation funding is achieved. This is a great solution that only impacts those who are already breaking traffic laws and does not impose higher taxes on NC residents. Being Constitutional law, this would have to go to public vote? Perfect for the November ballot (having the NC Legislature HOLD and follow #1 above by NOT allowing the NCTA to move forward at this time).

7. Pressure the Federal Highway Administration to own up to its promise. NC is a giving state. For every dollar NC puts towards the Federal Highway program, \$0.92 is promised back in return. A [presentation by the NCTA](#), slide 17, shows we are only getting \$0.88 back, and we've heard rumors of less than that actually coming back. The Federal Highway Administration should be held to its promise.

8. Make sure we are imposing proper and sufficient impact taxes on developers, including expanding road infrastructure at their cost in areas of development.

9. Be aware that \*if\* tolling is allowed to go forward, a cashless system brings up the issue of environmental justice. Low income households do not have the ability to receive credit if an account can be applied for and created and/or would likely default on invoices if billed monthly, a burden not deserved.

Thank you for your time and attention to this matter. David McDowell, Raleigh native and Founder of No Tolls on [540.org](http://540.org) welcomes any and all discussion of this matter and encourages more thought from all of you on, beyond and above the mentioned items in this letter. Please submit this letter into the public record. No Tolls on [540.org](http://540.org) is firmly against the NCTA's proposed Triangle Expressway toll project. We also want to enable NC Legislators to know there ARE viable funding options, as we have mentioned a couple. Toll roads are not the solution.

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Comments: I am fully supportive of all of your efforts. I have been riding the TTA Express Bus from Chapel Hill to Raleigh for several months. Fortunately, I have found a job closer to home in Durham (near NC Central). I would like to continue to use public transportation from CH to Durham but the route is a little long as it stands. Are there

plans to create an express route from Chapel Hill to NC Central/downtown Durham? I hope this is something that could be considered. I think it makes sense to connect all of the universities by an express route and to include NC Central University (among the others).

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Comments: It saddens and infuriates me every time I pass a bus stop and see elderly people waiting for the bus, especially in inclement weather, with not so much as a covered bench to rest on while waiting. Would you want your mother to rely on such a service? Forget expensive, grandiose mass transit schemes for able-bodied drivers who have shown for decades their disinterest in using transit and diminish the embarrassment of the services currently offered to those who have no choice. Raleigh can do better and it's a travesty that it doesn't.

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Comments: I am a Cary resident with an interest in working in some capacity to see the light rail system come to fruition. Although, I am currently working as an IT Analyst at Duke University Medical, my husband and I are small business owners in Cary. We are the principals for Myell Healthcare Staffing Services and have been in business over 6 years.

I recently became a member of the Women Business Owners of Cary, as well plan to become a member of the Cary Chamber of Commerce. I have had a family member use the Cary transport service (C-Tran) as a means to go to/from a job.

Summarily, I have a keen interest in this area for both personal and business reason. From an environmental standpoint, a light rail system will enhance and improve the quality of life for our residents. Our community will benefit from it as an alternative to driving; we would partake in the future of transportation.

As a business owner, our employees/healthcare workers need reliable transportation, regardless of the weather conditions; they are essential to the successful operation of any healthcare organization. The availability of a light rail system would be invaluable.

Is there someone that I could speak with in reference to an opportunity to contribute in some way to this wonderful project? I would make every effort to be committed to the cause.

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I want to strongly caution you against releasing a STAC report that places rail in the Raleigh-to-Durham corridor as a short-term priority. Whether right or wrong, the public perception is that plan failed, and it also is not as urgent as a short-term priority compared to connecting Chapel Hill and Durham, and connecting from Cary through downtown Raleigh to Durant Road. (Express buses can fill in the gaps, of which there are many.)

Please support these two end-pieces as short-term priorities so that I

can build the political support for them in the region. I can't support the Raleigh-to-Durham corridor as the linchpin. This region has TWO linchpins!

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My life and work is divided between Chapel Hill and Nice, France. There, "we" have just completed the first portion - 5-1/2 miles - of a new tram that started up in late November last year. Cost was more than 700 million USD. We are now debating the next lines to be added. It is a complex process in a more urban setting (Nice is about the size of Raleigh with a metro population of just over 1 million). Buses and trains were already a key part of the transportation network and they have been reintegrated into the first of the tram lines.

So far, it is being viewed as a huge success despite several years of awful headaches.

If you read French, you may find the project of interest and of possible relevance <http://www.tramway-nice.org/index.php>

"We" (I say that because I am both a European and US citizen and can vote in both places) have also moved since 1 Jan to standardize the bus fare for an even larger area making it possible even with the euro so strong, for someone to travel anywhere on a single journey by bus for \$1.50 USD.

Again, perceived to be a huge success.

(And, for people 60 and above, train travel is at half price.)

(I might add that I also was a resident of downtown Washington, DC throughout the construction and launch of the Metro there.)

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Comments: Hello There,

My name is Jack Ball and I am a resident of Vance County in Kittrell, NC. I am very happy to hear that a rail system is starting to be implemented in the triangle area. But, I feel you are neglecting an area that, within the next 10-15 years, will be largely populated with more people, business and transportation. This is the North One corridor from Wake Forest to Henderson / Rt. 85. I drive this Route on a daily basis since moving to this area in 2000. Everyday I see more traffic, more businesses being built, more apartment complexes rising up. I feel that the Special Transit Advisory Commission needs to rethink their idea of limiting the service to Wake Forest only and continue up Route One into the Henderson area. This would provide an excellent service to those people who live beyond Wake Forest to make it easier for us to travel into Raleigh, Durham and other areas. I know that if there was this service given to me from Henderson, Kittrell, or Franklinton, I would be first in line to purchase a monthly pass. First, one of the ideas of a Rail / Bus system is to be for people who cannot afford their own transportation, and the area that I write about could use a Rail / Bus system for those people who need it. And the rural areas are in great need of this system. Second, with the rising costs of houses, apartments, and other expenses in the Raleigh / Durham area, those who cannot afford to live in Raleigh, North Raleigh and Wake Forest, are moving more north into Youngsville, Franklinton, Kittrell and Henderson on a

daily basis. And we need a much easier, cheaper way to get around the Triangle area than our cars, trucks, etc. making Route One another new traffic jam.

Third, even though Henderson area is not part of the Triangle area, adding a Rail / Bus line would bring us closer. Franklin and Vance County would benefit with this rail going into wake county, and vice versa. I know I would go into Raleigh and Wake Forest more often on weekends with my wife and newborn child and spend money, than not going at all because traffic on Route One is too much.

I hope the Commission reads this letter and puts my thoughts into serious consideration. I know that this process is going to take a long time and cost billions of dollars, but wouldn't it be good to prepare for the future of growth going up Route One instead of catching up with the demands of the population that is happening right now?

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Comments: Every train should allow for the transportation of bicycles on every run. Cyclists need to travel to and from work at the same times as everyone else. Caltrain carries thousands of bikes EVERY day. The climate in North Carolina is conducive to cycling and we should expect and plan for a very high usage of the trains by cyclists.

On average, more than 300 bicycle riders board at the San Francisco Caltrain station each day, with nearly 2,000 daily bicycle riders between San Francisco and Gilroy.

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Comments: Even if a regional rail system is not put in place in the next 10 years, the land should be acquired NOW. I lived in Washington DC as the Metro was being put in and it was difficult to place a subway system in an existing city. If we purchase the land now, we'll save that much more for the day when we install a rail system.

Also, the system should be comprehensive like the Boston, Philadelphia and San Francisco systems. It should include bus and subway routes for local traffic and rail for longer routes. For example, people could live in Oxford, but take a train into Raleigh every day. Or I could take a subway from Durham to Chapel Hill to go listen to music.

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Please reconsider the regional rail system. It is crucial that such a light rail system includes a stop AT the RDU airport in order for it to be successful. The Airport Authority must be willing to accept this and cooperate. If they refuse, the TTA should look at possible legal remedies to benefit the citizens that you serve.

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Comments: I grew up in Texas in the 50's and 60's when the only people who rode the bus were school children and the colored maids. My mother would have been embarrassed if she had lowered her social status to have to ride the bus. In the meantime, cities abandoned their public transportation as the public fled to the suburbs and the independence of the automobile. Downtowns died, and the car was king. I fear that some of the same attitude prevails among Triangle leaders who see public transportation only as an extension of the

welfare system for the elderly and poor and would never deign to give up their two SUVs and

vacation homes in the mountains or the beach. We've become a prisoner of our own excesses, and we don't want to give up a lifestyle we've grown accustomed to in the past 50 years.

But time already has passed us by, and the notion that two cars sitting in the driveway is a status symbol has become an archaic vestige of the past. What this commission must do is to look to the future with a vision not only for 30 years ahead but also for more short-term solutions to immediate problems.

I would ask you to consider these broad assumptions in your planning:

1) Plans don't accomplish anything without action. Think big but propose what is realistic.

2) Bureaucracies may create volumes of paperwork and solicit public input from numerous forums and studies but without your leadership and vision, the political will, and public support nothing will happen.

3) We've been told that previous transportation plans "numbers" didn't add up, that is the assumptions upon which they were based were faulty. We have allowed the federal government to tell us we didn't know what we were doing because we assumed that we were primarily dependent on federal funding to meet our needs.

4) When I moved here ten years ago, I was excited to learn of plans for improving public transit in the Triangle and providing more transportation options. I had enjoyed the multi-state, regional system of the Washington Area Metropolitan Transportation Authority with an efficient system of buses, subways, freeways, biking trails, and inter-governmental cooperation. I had a dream that one day we might see a similar system here. But for that most of that decade I've only seen more plans, more consultants fees, more bickering, most empire-building among various local, state, and federal agencies assuming more restrictions and negative thinking that has stymied any progress. All we need to see is the debacle on the modernization of I-40 as an example of the lack of leadership in promoting better transportation in the Triangle. The Environmental Impact Statements, Long Range Plans, and public forums may have provided work for government and university employees but little else. In other words, the process has become too cumbersome to be workable.

5) When you consider the polls of seniors, you will find that transportation is second only to health care as their top issues of concerns. If you also will consider the explosion of retirement communities in the Triangle during the past decade, you will observe that one of their weaknesses is the lack of public transportation and a reliance on private transportation services that limit residents' independence. Why should numerous facilities be forced to fund a driver and van that only provide transportation a few days a week at a very high cost? Because there are few other options available.

6) The public has been sold a bill of goods that if funding is provided to improve public transportation then that will reduce improvements in public roads and highways. It isn't a question of 'either more roads or more public transit'; it is how do we provide for both?

7) Studies have shown that the Triangle has too low a density of current population to support public transit and that people will not use it.



Cities all across the nation have demonstrated that development follows transportation corridors. We have our own examples here with I-440 and I-540. Other cities have found similar patterns with rail corridors. The current trend in multi-use development demonstrates the popularity of communities that are less dependent solely upon the automobile. We want more options and fewer wrecks. We can encourage a more pedestrian-friendly, ecologically-sound, economically-viable community in how we build the Triangle of the future. Why are all the high-rise condos going up in downtown Raleigh and elsewhere? Because people are voting with their pocketbooks that they want independence FROM their automobiles and more options in a viable urban environment that the Triangle ALREADY has become. Do we want to become another Atlanta or a Portland, another Los Angeles or a San Francisco? The decisions you make now will determine our future.

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Comments: I believe a light rail system that ran East and West from the RDU to Zebulon and North and South from Wake Forest to Clayton would be very successful in the Triangle. It should be routed for major stops at hospitals, shopping areas, sports arenas, universities, working centers, downtown, etc., with adjoining bus service to local areas around each major stop. Each major stop should have a free park-and-ride lot.

I just recently moved here from the St Louis, Mo area where their light rail system was very successful. In that area a lot of the businesses and the military at Scott AFB and other smaller installations around St Louis purchased metro passes for any employee that agreed to ride the rail and not drive to work. The system was very well run and always full. Even though I lived on the East side of the last stop, when I went to the airport or downtown to a ball game I always drove to the nearest park-and-ride and rode the train. It was always dependable. I believe the system is one of those things that "if you build it they will come" especially if the local businesses and agencies get behind it and make it appealing for their employees and customers. Having lived all over the country I consider the St Louis metro one of the best.  
Thanks, for considering my input.

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WHY IS THE CENTER LINK OF THE RAIL PLAN, NOT THE PRIORITY????

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The Executive Summary is extremely well-written. I especially liked the 3 challenges in the concise "dollars, development and decision-making in the implementation section. The one thing they missed is the water infrastructure. Whatever Land Use Pattern and protection it is referring to, it is not working given the current drought situation. RTP is currently not a "leader" in delving out water use restrictions and unlimited access to ground water aquifers. I would recommend the authors restate that or drop it entirely. We heard from a realtor when we first moved here in 1993 that NC's greatest limiting growth factor will be water and it is certainly coming to bare now.

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Comments: I think we need a transit system besides the buses. They're too much hassle. To use the bus system in Durham, you would have to transfer at least once to get from Hollway St. to 15-501 and it takes anywhere from 1 hr. to 1 1/2 hrs. It takes 15-20 mins by car. That's not worth it to get to work. I recommend some type of rail system. Like the MARTA in Atl. w/ stops downtown and pick ups as well. I'm thinking about 2 to 3 stops in North, South, East and West Durham. All have major business in their districts. Let's not forget Duke Univ. and all the hospitals.

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Comments: It would be nice if there were plans for an express bus from, say, the Lowe's Home Improvement lot at 64 bypass and 15-501, to Chapel Hill. The current North Chatham park and ride is nearly 2/3 of the way to work for me, and so does not represent a realistic or viable transportation option. The current shared bus ride apparently leaves from a location about 10-15 miles west of Pittsboro, which means that I would have to ride ~15 miles from my home (684 Old Oaks Lane, Pittsboro NC 27312-8422) to get to a shared ride location with horrible timing, rather than drive directly to campus, which is about 16-18 miles away!

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I'm retired, but I worked in RTP from '89 - '95 after which I worked in other states including NY. Up there I took the Metro North from CT into Manhattan and the subway to my building...didn't even have to get out into the elements once I got on the train in CT. I think if we were building an RTP today we would have started with a subway system underneath before we built these lovely corporate campuses over them. Let's face it, they may be serene, but they demand that you drive your car to the site especially if you work somewhat irregular hours like most Park folks do.

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Comments: I support light rail in the Triangle, but I think you will not

- > have committed riders until you tackle the broad issue of what folks do
- > when they get to places like RTP. They're stranded perhaps a mile or more
- > from their office. In NY when you take the light rail into Manhattan you
- > can take the subway to within a block or so of your office and the subway
- > trains run every few minutes. I know a few buses run out in the park, but
- > not frequently enough and the coverage of RTP isn't there. Besides, when
- > we get the ice storms like the one in 2005 that stranded folks in RTP, a
- > bus would have not been any advantage. Light rail and subway would have
- > gotten people home.
- >
- > I suggest you forget connecting Raleigh to Durham with one stop in RTP and
- > focus on delivering door to door service throughout RTP and then branching
- > out to connect that to a few spots in Raleigh and a few in Durham. Add
- > spots in those towns and add Cary, Apex, RDU, etc. as you can afford it.
- > When folks know they can get to the Park by train and get to their
- > offices, they'll gladly give up the traffic jams on 40 and 540.

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Comments: I am already a rail commuter in the triangle. 5 times a week I take the Amtrak Piedmont from Raleigh to Durham and then catch the 403 TTA bus across the street to NCCU for class. Its convenient and comfortable. The lack of a mid-afternoon return train puts me on a 1+ hour bus ride back to Raleigh. I am all for the NCRR proposal since I already commute on the line, I need more Raleigh-Durham rail options! Is it not cheaper to run trains on existing tracks(plus improvements)? I don't understand why TTA is bent on putting their own tracks up parralel to exisiting ones,even in the already double tracked Raleigh-Cary corridor. In doing internet research I have seen that all of the newer commuter rail lines(Nashville, Albuquerque,Minneapolis)use freight tracks. It would be even better if it stretched to North Raleigh and Wake Forest since I live off Durant Rd.

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After reading The News & Observer, Sunday, January 27, 2008 about expanding the transit system became an interesting subject to read. I moved to Raleigh from an area outside Boston that was accessible to a transit system. I lived closed to the town of Framingham and there one could take the Logan Express Bus Depot to Logan Airport. A traveler could park their vehicle close to depot lot for a fee. From Logan Airport their are trains to travel in and around Boston. At Logan Express Depot there are several buses for other destinations, particularly New York City. New York has a wonderful transit system. I grew up in Brooklyn and always took the subway or bus to many places. Many places in Europe have efficient rail and bus services. My question is: Have other places been researched for ideas (who have a transit system) for expanding rail system in North Carolina, particularly the Triangle? Thank you for reading my comments.

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Comments: The factors for determining long range growth and transit options can vary considerably over time, and are particularly dependent on the state of the economy (unemployment rates), individual preferences, commuting choices borne of necessity, and changes in the private sector with respect to what is negotiated between

management and the work force.

So it's quite a complicated stew that's being brewed when experts, try as they might, attempt to figure the transportation needs of a metropolitan area. I think it is important to recognize the following about commuter traffic and prospective growth in the Triangle:

1. The average daily commute is still less than half an hour one way. This single truth does not bode well for long term growth and heavy capital expenditures on mass transit systems. It has been proven time and again that unless commute times increase to the 45 minute - 1 hour range, most commuters will not consider leaving their cars in the driveway.

2. The density of employment centers in the Triangle are not large enough to justify mass transit, particularly rail, in most cases. There is often mention of RTP as a prime target for mass transit options. But given that the number of jobs at RTP hovers around 40,000; that a lot of these jobs are high paying (meaning that employees have comfortable cars and can afford gas); and that the private companies in RTP have several options available to help their employees negotiate traffic (everything from flex time to allowing 1-2 days working from a home office per week), the risks of heavy capital expenditures for systems that are underused are high. More often, transit stations and improvements that involve institutions which conform to more standard "shift" work (universities, hospitals, downtown areas) are typically more beneficial.

3. I-40, that bane of commuter existence in this area, is the lone east-west high speed traffic link through the area, and extends statewide. With the extensive growth in Johnston County, and the affordability of homes in locations east and southeast of Raleigh, this corridor will continue to exhibit the absolute worst traffic in the area for many years to come.

4. There is a significant amount of employment in this area where people who are not transit dependent commute fairly long distances to work jobs which are not high paying. The cost of gas and commuting time are becoming more significant factors for people who fall in this category. Historically, mass transit improvements to aid people in this position do not ultimately pay off, one reason being that their homes are often on the periphery of urban areas (ie Youngsville, Johnston County, Mebane).

5. The area will continue to be an attractive one for people from northern states. There is so much here, culturally and professionally, and the weather is excellent. As long as the area is affordable, particularly with respect to housing, the influx of out-of-state people in search of better quality of life will continue. Correspondingly, the developers and real estate industry in this area are extremely powerful, and the rate of expansion will ultimately lead to heavier taxes to sustain the infrastructure and school systems. In general, I believe that the Special Transit Advisory Commission should look at implementing an iterative approach by which some of these measures are tried, then evaluated, prior to looking at spending billions of dollars on transportation improvements. The most effective of these are the following:

1. I-40 HOV lanes - With the tool of the Internet available to most for carpooling connections, there should be strong consideration towards making the left lane on I-40 in both directions between Chapel Hill and I-440 and for 10 miles along I-40 between Smithfield and I-440 either HOV 2 or HOV 3. The hue and cry due to such a plan would be extreme at first, but groups would quickly form that would travel together to major employment centers, in return for the 10-20 minutes saved in each direction. The HOV time should be limited from 7AM-9AM in the morning, and 4PM-6PM in the evening, then the lane opened to all drivers. This measure would lessen the number of cars by the hundreds on this thoroughfare.

2. Ramp metering - This simple tool does much to control the amount of "platooning" that occurs when cars are entering a freeway from a ramp. Used to great effect in the Washington DC area along portions of I-66, this concept allows for much better traffic flow on the main route. Would suggest this along I-40 through the RTP interchanges, and other designated areas as results of traffic studies.

3. Other TSM measures - Synchronization of traffic lights through main corridors (Route 1, Route 70 south of Raleigh, NC 54) should be targeted and implemented for the primary peak hour directions. These relatively low cost improvements would reap dividends to commuters on these routes. Although unpopular, restrictions on truck traffic (18 wheelers) during peak hours wouldn't be a bad idea.

In terms of highway improvements, the most significant deficiencies occur on I-40, due to the extreme amount of traffic from both commuters and "pass-through" traffic. The singular greatest impact on this problem would involve the completion of I-540 around the south side of Raleigh through to the I-64 bypass, or at least to I-40. This measure was needed years ago; with the expansion in Johnston County, its needed even more now. Lesser transportation improvement projects being considered by NCDOT should be shelved in favor of this project.

With respect to mass transit, the FTA was correct in their conclusion that \$800 Million for a rail system was not justified. Improvements to the bus system should precede plans for rail systems in this area. It's as simple as that. Instead of spending \$5-15 Million for bus system improvements, invest more money in these proposals. Commuter satellite parking lots in perimeter communities (Smithfield, Hillsborough, Chapel Hill) with express bus destinations at key employment areas are a much better investment for this area than rail. Combined with HOV lane restrictions, these improvements have reaped dividends in urban areas. Also, the advent of private large van - mini bus companies to provide services from commuter satellite lots has supplemented the bus systems in many urban areas.

Rail or light rail systems are not the answer for the Triangle. The density of the employment centers in this area is not adequate, and the primarily suburban style of living here is not conducive to justification of the heavy expenditures to build such a system, both with respect to right-of-way purchases and construction costs. It is more than likely that as the area expands, the employment centers will diversify to the perimeter of the urban centers. This was, in fact, the trend in the Washington, DC area in the 1990's, where the planners started having to use the term "reverse commuting" to describe the diversification of employment centers.

A light rail system through one part of Charlotte is nice, but 12,000 riders a day will not mean much for an area of this size. The previous ridership forecasts for the ill fated TTA system were along the lines of 22,000 riders per day. As a matter of comparison, one spoke of the DC Metrorail system carries more than 300,000 riders per day. There should be a litmus test of practicality and a commitment to making changes which result in the most impact for the least amount of public funds spent. The looming infrastructure crisis in this country, as well as the continued need for school and health system improvements on a local scale should inform the commission when determining transit recommendations for the best common good.

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Comments: The system in Charlotte is a great start. A system we need to look at is the

one in the Puget Sound, Seattle, Washington area. [www.soundtransit.org](http://www.soundtransit.org)  
Please look at the website and contact these people. This state needs to look at alternatives to urban sprawl that include more than road building. Raleigh is dirtier, and more congested and developers instead of the taxpayers and local governments have been setting the standards in our area for too long. The Seattle area and State of Washington have decided to invest in a certain quality of life for their citizens and the future, and we need to take the steps here as well. The Triangle should be leading this effort, but it must be a mandate at the state level. I shutter to think what life will be like here if we do not have a plan for the future. The greenway system is a good example of long term planning and vision. Let us get started.....

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Comments: I hope that the STAC will adopt a forward-looking plan rather than a fix of political expediency and a short-term focus. We need to do more than just to build bigger roads or a more efficient regional bus system. I wonder if the highway planners only considered the cow pasture that existed five years ago when Interstate 540 was built that has become Briarcreek.

Development follows transportation corridors rather than vice versa. Of course we must provide for existing employment centers and consider the political and the economic realities that the Triangle consists of three counties, multiple cities and a relatively politically weak regional planning authority.

What is needed even more than plans, funds, and designs are the vision and political will to create a bright future with a transportation system that is both economically and environmentally sound and not just some rehash of the haphazard development of the past 30 years.

The era of cheap land and suburban sprawl is over in the Triangle.

America's love affair with the automobile is waning - just look at the growth of high-rise condos downtown. Traffic gridlock can become the death of economic development. We must consider every option, not just improving a few, and look at creative methods of financing without continuing to be dependent on a hand-out of federal dollars. We will get the kind of community we want only if we do not become grid-locked among competing self-serving interests who work only their for their own benefits using political manipulation.

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Comments: the subway must connect the airport, not as an afterthought but as an integral part of the system. look at the Atlanta subway. Notice how the trains connect multiple outlying parking garages to business centers and the airport. Parking then is dispersed throughout the system rather than everyone trying to park at the airport, or in the main business centers. leaving the airport off, or making it awkward to get to the airport with baggage etc will make the system less effective from the beginning. Airport traffic will ensure that middle class folk ride the trains. Else you may have only the hobos on the trains.

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*[Note: the following two comments were submitted by the same citizen.]*

Comments: I would welcome an express bus from Pittsboro to UNC Chapel Hill. I currently use the Park and Ride in north Chatham that connects with free CCX Chapel Hill

Transit bus to UNC, but would love to see one located even closer to Pittsboro. About 60 percent of workers in Chatham county commute out of the county, many of them to

UNC, RTP and Raleigh. We have been deluged with new residential development, so the number of commuters along US 15-501 will soar in the next 5 years. Having express buses that would connect Pittsboro to UNC and other Triangle points would significantly reduce traffic on our highways, reduce carbon emissions, and save commuters money in gas and parking fees. If you kept it free and frequent (every 15 minutes) as it is now, I believe it would be successful. The CCX bus I ride daily is always full at morning and evening rush hours and is a pleasant experience. Moreover, we have lots of retirees in the Pittsboro and north Chatham area that would welcome an easy way to get to shopping points without having to drive.

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The reason my bus fare is free is that UNC is subsidizing Chapel Hill Transit, as a way of helping its employees but also of keeping fewer cars off campus and in Chapel Hill. It's precisely the incentive I needed to give up my parking space and choose the bus. UNC also bought the land for the park-and-ride lot I'm using in north Chatham. Perhaps if they could purchase land further in Chatham near Pittsboro and help defray costs of extending service there, fares could be kept free or very low. Roger Perry, who chairs the UNC Board of Trustees, has a major mixed use development on the north edge of Pittsboro (Powell Place), ideally situated at the intersection of US 15-501 and US 64 bypass -- who knows, maybe there's land there that could be made available for a park-and-ride lot for UNC and possibly others, many of whom will reside in Powell Place. Just a thought.

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Comments: I live and work in CH/RTP, NC and SF/SJ, Ca. When I am in the Bay area I take Caltrain and a company (Cisco) shuttle to/from work.

I have learned several hard lessons while using this mass transit commute:

1. Only 1 transition each way between Mass transit services is acceptable for commuting on a daily basis. I moved near the 22nd street Caltrain station to avoid a transition.
2. A company provided shuttle is preferable to the SJ light rail (saves >20 mins. each way). This should be evaluated for RTP commuters. Company funded shuttle picks up/drops off employees at a transit station when commuter trains are scheduled.
3. The Caltrain baby bullet schedule for commuters is invaluable and drives commuter participation.
4. The Caltrain stations I use (22nd Street and Mtn. View) are heavily used by commuters but are sorely lacking in commuter amenities.

I will be happy to provide additional mass transit experiences if requested. I would love to use mass transit in RTP and Chapel Hill BUT it must be properly designed (including the stations) for commuter participation to reach acceptable levels.

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On my wish list are better public transit connections between communities in the triangle – more than just downtown to downtown. I have personal interest in the West Raleigh to Cary route. It is well traveled judging by the traffic backup in the morning and night. West Raleigh to Cary – Edwards Mill Road - Wade Ave - I-40 – Harrison Ave - Weston Pkwy

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Comments: I have to weigh in.....

We surely should not wait until gas prices are out of reach before we put something like this in. I believe the people of Raleigh would utilize an efficient system of commuter or TTA trains with park-n-ride areas, etc, that make them accessible and that have schedules that allow flexibility and efficiency. I realize TTA trains would probably be the most expensive, but seems like the option most people would utilize. PLEASE avoid more gas -guzzling bus routes or HOV lanes- Carpooling is a hassle because its inflexible-people simply do not have the same work schedules! Adding bus routes only contributes to fuel consumption/pollution. I would envision a world where my kids may not have to own cars to get to their jobs in RTP. Or currently not having to DRIVE 50 miles roundtrip to pick up my niece at UNC for Sunday dinner! Please provide us with an efficient system that, combined with condensed urban living areas, can really reduce our dependence on fuel.



## **Public Comments Collected at the Feb 29 STAC Meeting**

### *Re: Map 1: Regional Transit Vision Plan*

- Station design. Enjoyable design helps with ridership.
- Adopt a regional vision; let MPOs implement all financing in accord with regional vision.
- Durham circulator is more of a loop than an “S”.
- Strategic parking. Strategy necessary to support transit
- Threat: Models of home-based work trips will change dramatically. People will arrive to work just-in-time and not as frequently.
- Threat: Changes in auto guidance and design will redefine SOV.

### *Re: Map 2. Enhanced Local and Regional Bus Service*

- No permission to use I-40 berm. Institutional issue.
- Service needs along US 64 and NC 751
- Enhanced service is not more buses it is priority treatment to improve on-time performance. Are these improvements funded? What are they?
- Priority bus lanes/signals are critical. Service must approach the convenience of private vehicles. MPOs must stop building parking facilities to reduce the convenience factor, making public transport more competitive.
- 

### *Re: Map 3. Recommended Rail Investments: Connecting Between Economic Centers*

- Is commuter service/congestion management the priority? If so, say so.
- Support for Raleigh Convention Center. Convenient and frequent access from airport to convention center. Food and Beverage tax funds many of our projects.
- Raleigh to RDU and RTP will serve more people than any other link. Why is it a low priority? Has potential of being the most successful link.
- Should show a station in downtown Raleigh.
- Show the Cary to RTP link in same color, but shows it is a separate segment.
- Service hours need to be seven days. Customers need to get to leisure/nightlife activities on weekends. Examples: youth soccer, music venues, other youth activities. Limited service needed 7 am to 12 am on weekends.
- Cary to RTP/RDU is a very important link and continues to be very congested. This plan appears to underserve this need. If not rail, there should be a good alternative.
- Showing the rail investments overlaid on 2035 total trip numbers conveys idea that the rail investments on this map are for 2035. If so, the Cary to RTP/RDU link would not be considered before 2035.

### *Re: Map 4. Transit Circulators or Connectors: Connections Within Economic Centers*

- Raleigh City Bus Plan is entirely conceptual. Does not relate to circulators.
- Service should connect directly to Raleigh/Cary and should be operating on the same schedule as the air traffic. The current weekend schedule is inadequate.
- Raleigh circulator must serve downtown Raleigh and Civic Center. Also need people mover at NC State.



February 15, 2008

To Members of the Special Advisory Transit Commission:

Thank you for undertaking the difficult task of developing a new look at transit in the greater Triangle area. Your work is critical to the continued success of the region.

It has recently come to our attention that there may be confusion regarding the possibility of "light rail" service in the North Carolina Railroad Company corridor. I want to take this opportunity to clarify this subject as you complete recommendations on how best to improve transportation.

In the North Carolina Railroad Company's Master Agreement with Norfolk Southern (see attached), light rail operations are expressly permitted in the corridor if on separate tracks. Light rail can be operated within the North Carolina Railroad corridor; however, the system must meet Federal Railroad Administration (FRA) or Federal Transit Administration (FTA) safety and related guidelines, or both. Any necessary FRA or FTA approvals or safety-related exceptions are the responsibility of the transit operator.

The clearance required between existing (or future) railroad tracks and any separate light rail tracks would largely be a function of (i) the railroad's need for future expansion of freight and passenger (and potentially high speed rail – some of which would also be required to be on separate dedicated tracks), (ii) federal safety requirements, and (iii) the type of transit equipment used. Typically, this clearance would be between 26 and 60 feet.

In contrast, "commuter rail" equipment can co-exist on shared tracks with freight and Amtrak passenger trains, with adequate track capacity, proper signaling, etc. This type of service is the subject of NCRR's pending study. Commuter rail equipment must be FRA compliant (e.g., all Amtrak-type cars and some, but not all, DMU's meet this requirement) and is typically much lower frequency service than light rail.

Many of you recently visited Charlotte and rode on their new Lynx light rail line. The 9.6 miles of CATS light rail that is currently operational shares the corridor (but not track) with freight for 6 miles. For the corridor portion that is shared with freight trains, Norfolk Southern required that an electrical fence wire be placed between the freight

track and the light rail tracks, to notify each party in case of a derailment. On the Lynx line, the Norfolk Southern track is a dead end spur, not a main line or through track. CATS constructed bridges over many of the road crossings.

In the case of TTA's original rail plan, FRA commuter rail safety standards applied because federal regulators determined that the transit system designed was not an "urban rapid transit system." In *Research Triangle Regional Public Transportation Authority (TTA) v. Federal Railroad Administration* (2004, case number 03-1283, U. S. Court of Appeals for the Fourth Circuit) it was determined that TTA's Phase 1 plan did not meet the definition of an "urban rapid transit system." TTA's plan was viewed by the court as a "commuter or short-haul railroad passenger service" and, therefore, was subject to FRA's safety and related requirements.

If you have any questions or would like any additional information about the North Carolina Railroad corridor, please do not hesitate to contact me or our consulting engineer, Jim Kessler of HNTB, Inc, at any time.

We hope this clarification will assist you as you continue to make important decisions regarding the future of transit in the Triangle region. On behalf of the North Carolina Railroad Company, we greatly appreciate the time and effort you have devoted to the work of the Commission.

Sincerely,



Scott M. Saylor

Attachment (1)

From Master Agreement, dated July 27, 1999, between the North Carolina Railroad Company and Norfolk Southern Railway Company:

Section 15. Regional Rail Operations within NCRR Right of Way

- (a) NCRR reserves the right to allow rail service such as that proposed by the Triangle Transit Authority or other light rail operations on separately dedicated infrastructure within NCRR's right-of-way, consistent with the terms of this Agreement.
- (b) If any FRA approvals or plan reviews are necessary, the passenger operator would be responsible for obtaining such approvals or reviews.
- (c) NCRR will require the service provider to assure that reasonable and efficient access by NSR to its present and future customers on both sides of the track(s) over which NSR has trackage rights is maintained at no cost to NSR.
- (d) NCRR will require the service provider to have in place before beginning operations, and to maintain at all times while such operations are conducted, indemnity agreements and liability insurance as described in Section 23 hereof.
- (e) The proximity of light rail operations to NCRR tracks and the related maintenance and operation issues shall be addressed under the PPC/Dispute Resolution provisions herein and in conformity with all federal regulations.

February 12, 2008

Mr. Bill Cavanaugh, Co-Chair  
Special Transit Advisory Commission  
P.O. Box 1551  
Raleigh, NC 27602

Dr. George Cianciolo, Co-Chair  
Special Transit Advisory Commission  
7704 Amesbury Drive  
Chapel Hill, NC 27514

Dear Mr. Cavanaugh and Dr. Cianciolo:

As one of three major research universities that will benefit from the extensive regional transit expansion that is currently being proposed, we are pleased that the Special Transit Advisory Commission has reached consensus on a set of recommendations that will increase local and regional bus service and launch railcars across the Triangle area by 2020. The group's endorsement of implementing the western corridor segment in the first phase is of particular importance to NC State as one of the largest generators of commuter traffic in the area.

The proposal to run rapid railcars from northwest Cary to downtown Raleigh and then north to Durant Road will benefit the University community and the City of Raleigh in a number of ways. Downtown, Main Campus, and the Centennial Biomedical Campus comprise a major employment center for the region, and only 28% of our almost 32,000 students live on campus. As a result, NC State generates a tremendous volume of vehicle traffic on a daily basis. The largest number of our faculty, students, and staff reside in zip codes to the west and north of downtown and would be immediately well served by a system linking the campus to those areas. For commuters from the west, the West Raleigh Station at I-40 would afford an optimum "Park and Ride" opportunity.

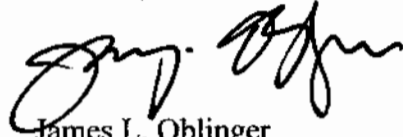
In west Raleigh, the RBC Center, Carter-Finley Stadium, the North Carolina Museum of Art, and the State Fairgrounds are major traffic generators that bring people in from throughout the region. With the opening of the new Convention Center, these West Raleigh entertainment venues must be connected with the downtown cultural/restaurant districts in order to serve convention-goers, sports fans, and tourists with downtown accommodations. Our student population would be well served with rail service both ways from the Main Campus west to the Centennial Biomedical Campus and the RBC Center/Carter-Finley sports complex and east to downtown restaurants and other attractions.

Mr. Cavanaugh and Dr. Cianciolo  
February 12, 2008  
Page 2

Economic benefits will accompany the more efficient movement of people, as growth in the region will be focused on dense mixed development along the rail lines. In concert with the City's application for Urban Improvement Zone designation and the potential for infrastructure funding from Tax Increment Financing for areas around the State Fairgrounds and west Raleigh Stations, the early implementation of regional rail service in the western corridor in particular will add density and bring much needed economic development to some of Raleigh's largest low-income areas.

In the next two weeks as the Commission works out the final details, puts recommendations into writing, and solicits public input, we encourage you to help identify ways that NC State can contribute towards successfully demonstrating that regional mass transit can work in the Raleigh area and bring economic development along with it. As a large stakeholder in commuter transportation issues, the University stands ready to support regional development strategies and urban redevelopment that will positively impact our students, faculty, and staff by improving mobility options and guiding urban growth patterns for years to come.

Sincerely,



James L. Oblinger  
Chancellor

JLO/cmb

cc: Charles Meeker, Mayor, City of Raleigh  
Joe Bryan, Chair, Wake County Board of Commissioners  
Ray Rouse, Chair, Centennial Authority  
Harvey Schmitt, Executive Director, Greater Raleigh Chamber of Commerce  
David King, General Manager, Triangle Transit Authority  
McQueen Campbell, Chair, Board of Trustees, NC State  
Charles Leffler, Vice Chancellor for Finance and Business, NC State  
Kevin Howell, Assistant to the Chancellor for External Affairs, NC State

Alliance members and partners,

From May 2, 2007 to April 25, 2008, the 38 member [Joint MPO Special Transit Advisory Commission \(STAC\)](#) examined the future of regional transit in the Triangle. The group finalized its recommendations on April 25, 2008 and will formally release its report to the region's two metropolitan planning organizations during spring 2008.

As the regional business community's voice on mobility and multimodal transportation issues, the Regional Transportation Alliance supports the efforts of the STAC during 2007-08. We recognize that more detailed studies and a focus on governance changes are essential to realizing our transit future, and we urge that those initiatives begin as soon as possible. There is growing interest in regional transit, and the urgency to move the region forward is clear. We remain committed to helping lead the additional conversations on transit options that will help all of us get from here to there more quickly, more efficiently and more safely in the years ahead. The Alliance thanks the members of the STAC -- in particular those that are from [Alliance member or partner organizations](#) -- and applauds their individual and collective service to regional mobility!

Attached is our official position on the final STAC recommended vision, which we presented to the STAC at their final meeting on April 25, 2008.

2008 Alliance Chair  
Rusine Mitchell-Sinclair

Regional Transportation Alliance  
**DRAFT** final position on  
Special Transit Advisory Commission (STAC) report

**The Regional Transportation Alliance supports the overall three-pronged STAC regional transit vision consisting of the following prioritized sequence of investments:**

1. **Enhanced regional and local bus service**, including express bus corridors – must precede other, more capital-intensive investments to provide visible improvements in our regional transit system, build transit ridership, and grow public support for transit across the region;
2. **Several subregional transit circulators**, serving Chapel Hill, Cary, Durham, Raleigh, and the RTP-RDU area – all initially bus, with some becoming light rail/trolley – must be next in sequence to create focused segments where enhanced land use and mobility options are possible; and
3. **A 56-mile regional rail system** touching Chapel Hill, Downtown Durham, RTP, Downtown Cary, Downtown Raleigh, and North Raleigh – perhaps preceded by commuter rail, with potential commuter rail extensions to outlying areas – will complete the future regional transit vision.

**The Alliance recognizes that a robust local funding source is essential for realizing our region's transit vision**, and the Alliance supports the STAC's recommendations of a substantial local option funding source (½-cent sales tax or equivalent) as a primary funding mechanism, with State funding complementing the local share.

**The Alliance believes the following two principles are critical** for establishing and consolidating support for the prioritized sequence of regional transit investments described above:

- **New governance model and public accountability required for support and success.**
  - Governance remains our biggest concern because the specifics of how the program will be managed are essential to gaining voter approval for the vision throughout the region
  - The overall package of projects – including the proposed local funding source(s), the associated financial plan, the breakdowns by transit mode, and local vs. regional splits – must be authorized by individual boards of county commissioners and approved by a vote of the people in participating counties
  - Implementation of the regional transit vision, including spending and prioritization decisions within an overall framework outlined by the authorizing counties, should be overseen by a regional board of trustees comprised entirely of local elected officials that represent the various taxpayer bases across the region
- **Detailed study of technology, project sequencing, land use integration and pedestrian-bicycle connectivity options to maximize the quality of life return on our investments.**
  - A variety of bus technology options should be considered to minimize energy consumption and environmental impacts while providing an attractive, state-of-the-art flexible route transit experience befitting our high tech region
  - While the circulators can begin using bus technology, the region should examine light rail/trolley options for each corridor, given the potential land use and ridership benefits
  - The region should evaluate potential short-term commuter rail options to and through the Triangle that may emerge from the ongoing NC Railroad study
  - The region should initiate a more detailed study of regional rail propulsion options for the regional rail corridor, given the inherent tradeoffs among costs, safety, flexibility, grade separation viability and environmental impact
  - All major capital investment studies must include up-to-date ridership and cost-effectiveness data that inform the selection of investment priorities
  - The region should examine and pursue opportunities to improve pedestrian-bicycle connectivity to the various elements of the regional transit vision
  - Local governments should seek opportunities to encourage and harmonize transit-supportive land use policies for property adjacent to future rail and trolley stations

**The Alliance urges that the necessary governance changes and detailed studies be initiated as soon as possible** in order to speed the realization of the region's transit future.