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 that 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.

	End points of the Initial 18 Corridors	Reconfigured Corridors
1.	Apex to Raleigh	▪ Apex to Cary ▪ Duke Medical Center to (Cary to) Downtown Raleigh to Durant Road
2.	Durham to Apex	▪ Durham Multimodal Center to Triangle Metro Center Rail Station (TMC) ▪ TMC to Apex
3.	Durham to Burlington	Burlington to Downtown Raleigh
4.	Durham to Carolina North	▪ Durham Multimodal Center to UNC Hospital ▪ UNC Hospital to Carolina North
5.	Durham to North Durham	Durham Multimodal Center to North Durham

<table>
<tr><td>6.</td><td>Durham to Raleigh via RDU</td><td rowspan="2">▪ Duke Medical Center to TMC
▪ TMC to NW Cary
▪ NW Cary to Downtown Raleigh / Government Center
▪ Government Center to Durant Road</td></tr>
<tr><td>7.</td><td>Durham to Raleigh via RTP</td></tr>
<tr><td>8.</td><td>Durham to Raleigh via US-70</td><td>Durham Multimodal Center to Downtown Raleigh</td></tr>
<tr><td>9.</td><td>I-40 Corridor: Wake/Johnston County boundary to NC 86</td><td>▪ Wake/Johnson County boundary to TMC
▪ TMC to NC 86</td></tr>
<tr><td>10.</td><td>Northern Arc of I-540</td><td>NC-540</td></tr>
<tr><td>11.</td><td>Pittsboro to Carolina North</td><td>▪ Pittsboro to UNC Hospital
▪ UNC Hospital to Carolina North</td></tr>
<tr><td>12.</td><td>Raleigh to Franklinton</td><td>▪ Downtown Raleigh / Government Center to Durant Road
▪ Durant Road to Wake Forest
▪ Wake Forest to Franklinton</td></tr>
<tr><td>13.</td><td>Raleigh to Fuquay-Varina</td><td>Downtown Raleigh to Fuquay-Varina</td></tr>
<tr><td>14.</td><td>Raleigh to Selma</td><td>Selma to Downtown Durham</td></tr>
<tr><td>15.</td><td>Raleigh to Zebulon</td><td>Downtown Raleigh to Zebulon</td></tr>
<tr><td>16.</td><td>RDU to Carolina North</td><td>▪ RDU to RTP/TMC
▪ TMC to NC 54 to UNC Hospital
▪ Durham to UNC Hospital
▪ UNC Hospital to Carolina North</td></tr>
<tr><td>17.</td><td>Southern Arc I-540</td><td>Triangle Expressway Turnpike</td></tr>
<tr><td>18.</td><td>UNC Hospital to Burlington</td><td>▪ UNC Hospital to Carolina North
▪ Carolina North to Hillsborough
▪ Raleigh (to Hillsborough) to Burlington</td></tr>
</table>

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.

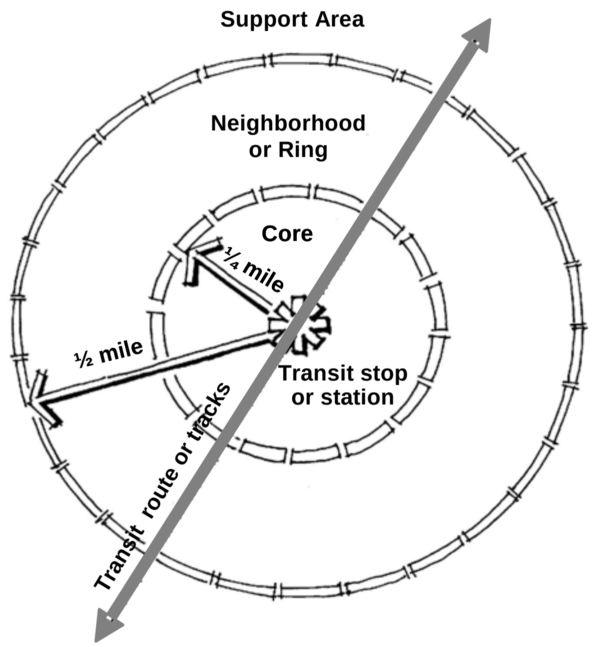
Local governments throughout the region have used the Guidelines as a basis for preparing specific local planning and development tools and/or incorporated the Guidelines into their comprehensive plans and/or adopted them. As identified in the Guidelines, land use and consistently applied public policy 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:

- <u>The Core</u>
  - 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)

- <u>The Neighborhood or Ring</u>
  - 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

- <u>The Support Area</u>
  - 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)*

	Residential Gross Density Units per acre			**Non-Residential Density Floor Area Ratio (FAR)***		
Activity Level	**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 NCRR 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 NCRR 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

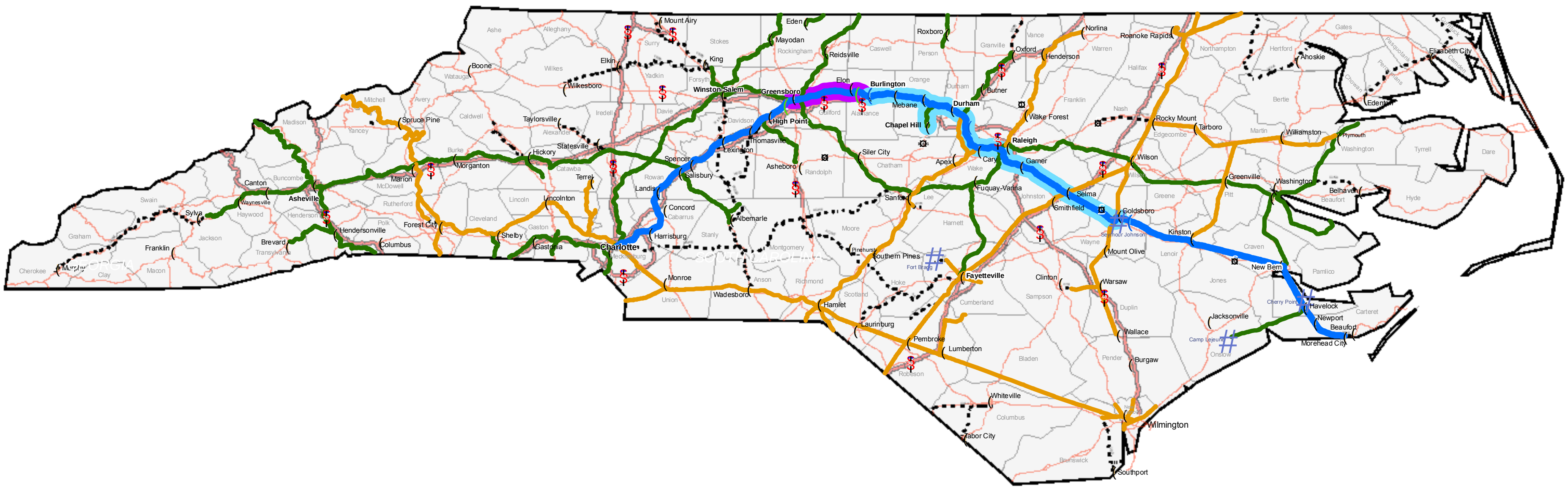
- Service Concepts & Equipment
  - 4 peak hour trains in each direction plus one mid-day (commuter/rush hour rail)
  - locomotive and push-pull rail cars (FRA compliant equipment)
  - no operating agency or organization has been identified

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 NCRR 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, NCRR has indicated that the study is not intended to be a substitute for state, local or regional planning, but to complement NCRR'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 NCRR 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

NORTH CAROLINA RAILROAD COMPANY

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.) 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. NCRR 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 NCRR 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 NCRR 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 NCRR 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 NCRR Shared Corridor Track Expansion Study. Also, in downtown Raleigh, the SEHSR corridor transitions from the CSX to the NCRR 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 NCRR 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 NCRR, suggest that commuter rail service could not be operated within this segment of NCRR without improvements that would increase capacity and other key operational factors.

Negotiated agreements with NCRR 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 NCRR 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 NCRR 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. NCRR 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 NCRR corridor).

- *Can staff provide some analysis of the land use implications of this alignment versus the NCRR 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
▪ Duke; 9th Street, Downtown Durham; Alston Avenue/NCCU	▪ Duke; 9th Street, Downtown Durham; Durham Technical Community College;
▪ North RTP; Triangle Metro Center (connection to RDU)	▪ Glaxo; IBM; Triangle Metro Center
▪ NW Cary; Downtown Cary	▪ Factory Shops/Outlet Mall; (connection to RDU); SAS
▪ West Raleigh, Fairgrounds, NCSU, Downtown Raleigh; Government Center	▪ RBC Center; NCSU College of Veterinary Med; NCSU Centennial Campus; Downtown Raleigh; Government Center

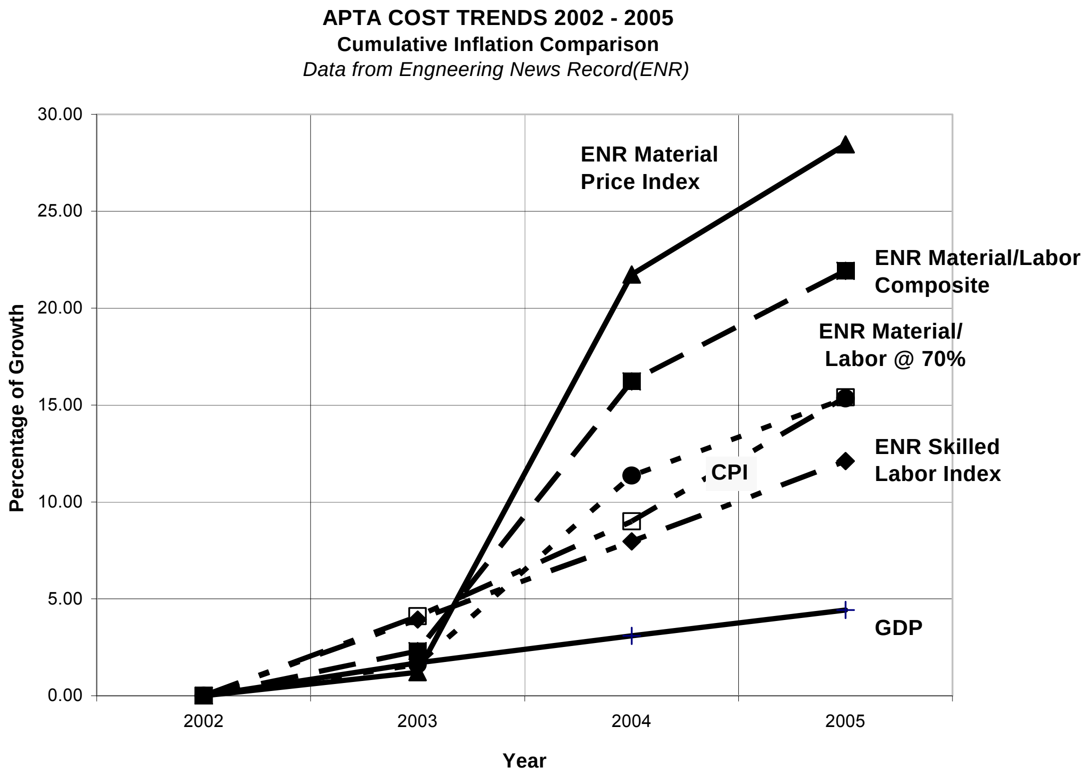
Beginning in 1997, state and local governments, institutions and major employers within the region participated in the selection of stations along the alignment of the high frequency (DMU) rail project corridor. These sites were specifically identified because they present existing market opportunities 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.

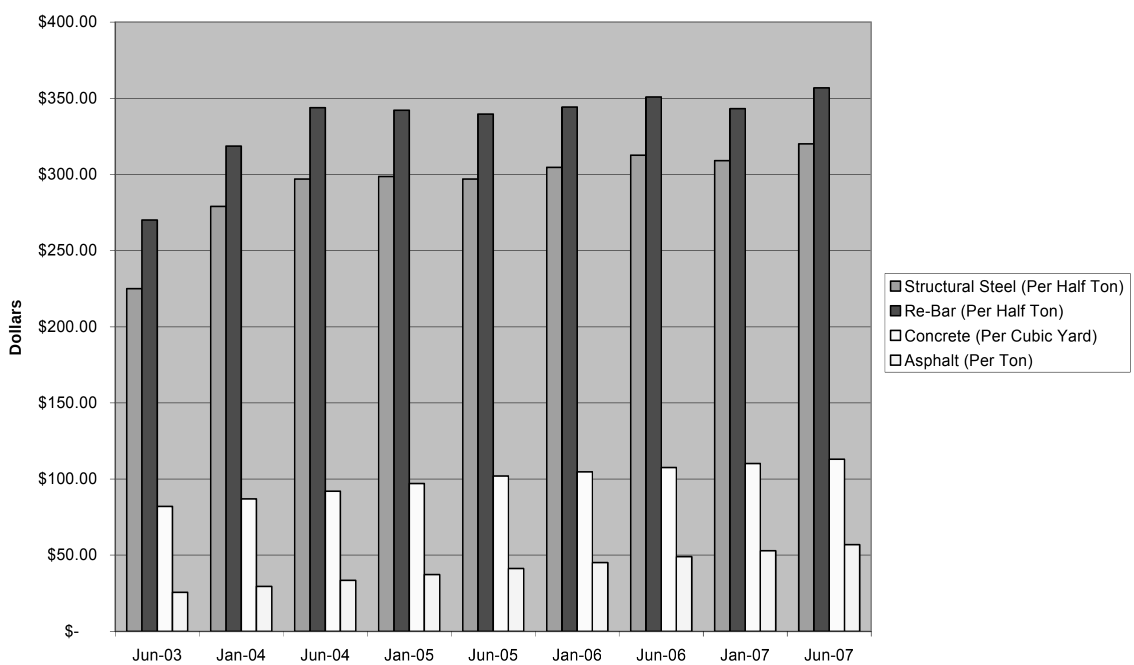
Transportation Costs
How do the costs of building and operating highways and transit compare?

- **Cost of Construction Materials**
-

Growth in Construction Costs relative to GDP and CPI



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

- **<u>Highway and Transit Development Costs</u>**

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

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).*

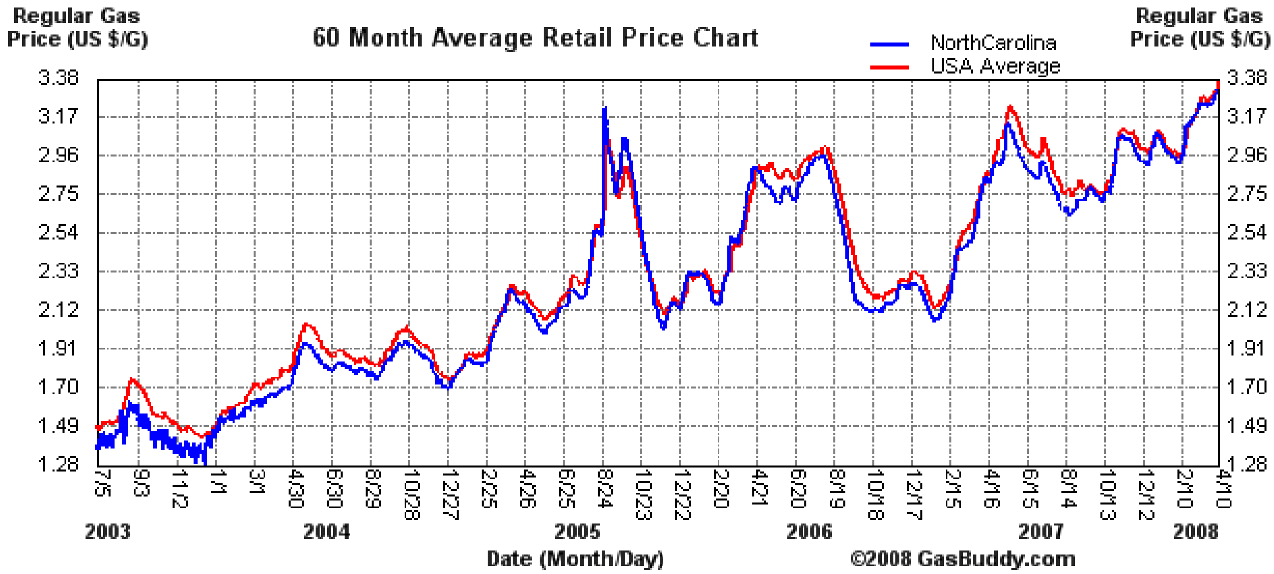
Depending on the design criteria, freeway lanes may carry 1,000 to 1,300 vehicles per hour per lane:

- 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.

- **<u>Cost of Fuel</u>**
  Data Source: 2008 GasBuddy.com



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

- **<u>Cost of Congestion</u>**
  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.

- **<u>Energy Use and Public Transportation</u>**

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
OPERATING COSTS						
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
TOTAL OPERATING COST PER YEAR	$2,177.42	$2,567.52	$3,033.00	$2,555.75	$3,527.86	$3,159.07
TOTAL OPERATING COSTS PER MILE (rounded to nearest cent)	$0.15	$0.17	$0.20	$0.17	$0.24	$0.21
OWNERSHIP COSTS						
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
TOTAL OWNERSHIP COST PER YEAR	$5,739.94	$6,696.67	$8,144.57	$6,860.24	$8,498.75	$7,881.29
TOTAL OWNERSHIP COST PER MILE (rounded to nearest cent)	$0.57	$0.67	$0.81	$0.69	$0.85	$0.79
TOTAL COST PER MILE	**$0.72**	**$0.84**	**$1.02**	**$0.86**	**$1.09**	**$1.00**
TOTAL COST PER YEAR	**$10,787.33**	**$12,612.52**	**$15,249.86**	**$12,846.11**	**$16,275.98**	**$14,981.01**

*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