

SECTION 6: Recommended Investments: Connecting Corridors, Service Concepts and Technologies

The best-functioning transit systems in the United States use a mixture of services, including light rail, commuter rail, subways, ferries and a wide variety of bus services integrated with bicycle and pedestrian facilities. A mix of services and technologies helps transit agencies respond to the specific transportation needs in individual corridors or neighborhoods. The maps and description in this section present the multi-modal components of the Regional Transit Vision Plan recommended for the Triangle region.

Map 1: Regional Transit Vision Plan

Map 1 shows the recommended Regional Transit Vision Plan (see page 8). This is the Special Transit Advisory Commission's (STAC's) long-term regional transit system, envisioned for the Triangle by the year 2035, the time horizon for the two Metropolitan Planning Organizations' (MPOs') Long Range Transportation Plans (LRTPs). It incorporates the best of previous plans and updated travel analysis work, combining new and more far-reaching transit services to outlying communities with investments in our urban areas to comprehensively serve the region. The Vision Plan includes investments in three major categories in order to serve our complex region:

Enhanced Region-wide Bus Network:

Green lines. The vision is built on a solid foundation of expanded bus service throughout the region to connect communities and bring communities presently unserved by transit into a regional transit network. See discussion of Map 2 for more details on bus service recommendations.

- High frequency, express service between Raleigh-Durham International Airport (RDU) and downtown Durham, downtown Raleigh (including the Convention Center) and the Cary train station park and ride

This section includes the maps and descriptions of the recommended regional transit investments included in Regional Transit Vision Plan.

- Enhanced bus service in core areas to support the rail and circulator investments, including increased frequency of service on heavily traveled routes, and adding more weekend bus service
- Rush Hour Only bus service to outlying communities
- Bus services to be coordinated with well-located park-and-ride facilities for routes targeted for commuters
- Enhanced transit access for pedestrians and bicycles around park and ride lots and bus stops
- Improvements at bus stops including benches, shelters, sidewalks and real-time bus location information

Basis for Recommendations:

- Greatest potential for early delivery of improved transit service
- Increase the number of Triangle communities with transit service
- Cost-effective way to provide transit service to areas with lower residential and/or employment densities
- Bus service provides vital feeder service to rail transit stations
- Shows the results of investment in transit building confidence in the region's ability to build a complete regional system

Circulators: Orange shaded areas. A series of circulators are planned to provide connections within our major economic activity centers, strengthening these vibrant centers of our region. Circulator services are designed to serve short trips (1 to 2 miles or less) at high frequencies. The circulators are a key new ingredient that the Commission believes is

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crucial to a successful transit future. Mapping the specific routes of these circulators will require additional planning and work with the local communities and transit agencies, so they are depicted as zones on the Vision Plan map.

- Circulator service connecting RDU and Research Triangle Park (RTP) is a high priority, frequently mentioned in public comments and by STAC members. Initially, this circulator is anticipated to be bus providing high frequency, curbside service to airport terminals. Ultimately this circulator could use a fixed guideway technology. Raleigh-Durham Airport Authority planning includes a connection with the regional transit system, which will need to be coordinated with regional connections at the Triangle Metro Center (TMC) in RTP.
- Additional circulators in the downtowns of Raleigh, Durham, Chapel Hill/Carrboro and Cary. Detailed planning should be carried out by the respective communities and the MPOs. Circulator routes should be routed to serve major employment centers, educational institutions, and civic and cultural activities.
- Circulators operate on a Full Service Schedule, so frequently that average wait times are no more than five minutes, which means passengers need not consult a schedule.
- The type of vehicle used for circulator services could be buses, modern street cars or trolleys. Local conditions and community considerations will help define specific technology.

Basis for Recommendation:

- Trips within our most intense activity areas are often short in distance
- Extends the reach and impact of the other regional transit investments
- Provides flexible travel options within major

centers, for example serving lunchtime trips within our major employment centers

- Can effectively and conveniently serve major event destinations

Rail Investments: Blue lines. The regional system is anchored by rail service that serves and connects the region's principal centers of activity. Rail investments are recommended for corridors projected to have our heaviest trip volumes, and where there are promising opportunities to shape future land use. See discussion of Map 3 for more details on these investments.

- Diesel Multiple Unit (DMU) train service takes advantage of existing transportation corridors between Durham, RTP, Cary, downtown Raleigh and north Raleigh
- Light Rail Transit (LRT) train service between Chapel Hill/Carrboro and downtown Durham
- Rail transit will be provided on a Full Service Schedule

Basis for Recommendation:

- Rail technologies provide solid anchors needed to shape land use along these critical corridors
- High capacity corridors can be served more cost effectively in the long term by rail
- Combination of rail technologies to maximize the effectiveness of transit service in corridors with different kinds of trip patterns.

Map 2: Enhanced Region-wide Bus Network Service

This map shows the corridors for which bus service is recommended (see page 9). While the STAC's charge focused on major transit capital investments, the STAC members also felt strongly that local and regional bus service should be significantly expanded and

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improved prior to the opening of any rail services. Overall, approximately 75% of the STAC recommendations for bus enhancements are regional in nature, and 25% are targeted for local bus routes. In the early years of the plan, bus service should be provided on the corridors slated to have rail transit service in the future. As rail services come on line, the buses on those same corridors can then be redeployed elsewhere in the region. See Appendix F for a table showing an example of how buses could be reassigned, effectively increasing the overall number of buses in service in the region.

The recommendations include services for the major corridors in the Vision Plan and additional services already identified by local transit agencies and communities. Local communities and transit providers will play a key role in locating and designing the local service enhancements.

Additional information about previous local bus planning efforts, including the Mayors' Bus Expansion Plan, a cooperative effort by several local communities and transit agencies, are provided in Appendix F. Recognizing that details of specific routes and schedules will need to be developed by local communities and local transit providers, the STAC recommends:

- High frequency, express service between Raleigh-Durham International Airport (RDU) and downtown Durham, downtown Raleigh (including the Convention Center) and the Cary train station park and ride.
- New, commuter express buses connecting outlying communities with major Triangle employment centers such as downtowns and universities operating on a Rush Hour Only schedule.
- Local demand-responsive services in smaller communities during the daytime.
- Increased frequencies on heavily-traveled, existing bus routes. Weekday-only services for these routes will be expanded to weekends, particularly Sundays, when service levels are particularly low at present.
- Buses should be rolled out in substantial numbers in the early years of the Vision Plan to build transit ridership and visibility across the region. The financial models demonstrate that the STAC recommendations for transit funding will cover capital and operating costs (including replacement buses) of 150 buses; as a reference point, Triangle Transit currently operates 52 buses during the peak commuting hours.
- Improvements to the quality of bus service. Many bus stops in the Triangle do not provide a quality waiting environment for customers. Additional benches, shelters, and sidewalks will make waiting for the bus more pleasant and comfortable. The STAC plan will also speed up the introduction of new vehicles and real-time bus location information for passengers.

Basis for Recommendations:

- Greatest potential for early delivery of improved transit service. While a new rail line may take several years to design, construct, and open, expanded bus operations can occur within just a few months of the approval of a new revenue source to fund expanded bus service.
- Increase the number of Triangle communities with transit service. Several outlying communities in the Triangle such as Holly Springs, Knightdale, Wendell, Fuquay-Varina Roxboro and Mebane do not currently have transit service. A regional transit plan should link these communities as soon as possible into the existing transit network.
- Cost-effective way to provide transit service to areas with lower residential

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- and/or employment densities
- Bus service provides vital feeder service to rail transit stations,
- Shows the results of investment in transit sooner rather than later. This builds confidence in the region's ability to build a complete regional system. As an example, when Charlotte passed a transit tax in 1998, voters very quickly saw the results as new buses were added throughout Mecklenburg County.

Map 3: Region-wide Rail Investments

This map depicts the rail investments recommended to connect the principal areas of activity in the region (see page 10). These investments connect the circulator services, and provide high quality reliable transit options for some of our most congested corridors. Rail investments are recommended for corridors that serve areas with existing and emerging transit friendly development patterns as well as areas that have the greatest potential to be developed or redeveloped in transit-oriented patterns. Two rail technologies are recommended because the specific corridors, travel markets and environs differ. The corridors are subject to different regulatory requirements; and they vary in their geometrics, availability of right of way, and anticipated distance between stops and stations (see Section 5 for additional detail on the different rail technologies).

The exact sequencing of rail projects is dependent on the length of time needed for right of way acquisition, environmental studies and approval, and the timing of revenue streams. Additionally, the sequencing of projects should consider how connectivity across the region can be promoted as well as support a strategy to pursue full federal funding participation for as many projects as possible.

As planning proceeds, these investments should be coordinated with the findings of the North Carolina Railroad Shared Corridor Track Expansion Study, an investigation of the feasibility, costs and operating standards for rush hour rail service on the Burlington to Goldsboro and Hillsborough to Chapel Hill/Carrboro corridors. Additional information on this study is available in Appendix D.

A segment-by-segment outline of the rail investments in the Vision Plan, from west to east, is presented below.

UNC Chapel Hill to Downtown Durham via Duke University Medical Center: Aqua blue line.

- Light Rail Transit (LRT)
- Full Service Schedule

Basis for Recommendation:

- Highest projected trips per acre in the region with intense employment and economic activity at the ends of the corridor
- Expands travel capacity in the US 15-501 corridor which is congested and constrained from expansion
- Provides high frequency transit access between Chapel Hill and Durham
- Land use patterns along corridor require frequent, closely spaced stops that are best served by electric-powered LRT trains which accelerate quickly
- Connects residential, educational and major employment centers as well as other locations at which market opportunities have already begun to focus development which is transit oriented.
- Enable service to additional stops between the Duke University campus and downtown Durham, including expanding Duke student housing areas, which could not be served by the DMU route.
- Operating efficiency, including costs, improves as ridership increases because

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adding train cars to accommodate additional riders reduces per-passenger operating costs

- High frequency rail service shown to support transit-oriented development

Duke University Medical Center to Triangle Metro Center: Dark blue line.

- Diesel Multiple Unit (DMU) trains
- Full Service Schedule

Basis for Recommendation:

- Shares stops (but not route) with LRT service between UNC Chapel Hill and Durham at Duke Medical Center, 9th Street and downtown Durham, in order to support different travel markets.
- Expands travel capacity in heavily-used corridors: NC 147, I-40 and US 70 corridors
- Provides high frequency transit access between Durham and RTP
- Supports RTP to RDU circulator
- Connects residential, educational and major employment centers as well as other locations at which market opportunities have already begun to focus development which is transit oriented.
- This corridor has opportunities for development and redevelopment in transit-friendly patterns, which high-frequency rail service has been shown to support
- Operating efficiency, including costs, improves as ridership increases because adding train cars to accommodate additional riders reduces per-passenger operating costs
- Takes advantage of an existing transportation corridor

Triangle Metro Center to NW Cary: Dark blue line.

- Diesel Multiple Unit (DMU) trains
- Full Service Schedule

Basis for Recommendation:

- Expands travel capacity in heavily-used corridor: NC 54 and Davis Drive
- Provides high frequency transit access between Raleigh, Cary, Morrisville and RTP
- Supports RTP to RDU circulator
- Connects residential, educational and major employment centers as well as other locations at which market opportunities have already begun to focus development which is transit oriented.
- Operating efficiency, including costs, improves as ridership increases because adding train cars to accommodate additional riders reduces per-passenger operating costs
- Takes advantage of an existing transportation corridor

NW Cary to Durant Road (just north of I-540) via Downtown Raleigh: Dark blue line.

- Diesel Multiple Unit (DMU) trains
- Full Service Schedule

Basis for Recommendation:

- Expands travel capacity in heavily congested corridors that have very limited options for expansion: US 1/Capital Blvd, NC 54 and I-40
- Connects residential, educational and major employment centers as well as other locations at which market opportunities have already begun to focus development which is transit oriented.
- Operating efficiency, including costs, improves as ridership increases because adding train cars to accommodate additional riders reduces per-passenger operating costs
- Takes advantage of existing transportation corridors
- Connects a major park and ride facility (NW Cary) that can serve outlying communities with the rail transit corridor.

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Coordinating STAC Recommendations with Other Plans

These recommendations will also coordinate with many existing land use plans already in place in our region. Beginning in 1997, local governments in Durham, Orange and Wake counties began identifying locations within their communities that would support future growth at higher, transit-supportive densities. Based on previous studies, smaller Triangle communities such as Apex, Garner and Wake Forest adopted locations for future rail stations with nearby development planned as walkable, higher density and to include a mixture of uses under approval or construction. Chapel Hill, Cary, Durham and Raleigh have adopted transit-oriented development implementation tools and designated fixed guideway transit corridors along with specific station locations. They have also undertaken small area planning initiatives which define transit-oriented development around some of the future high frequency rail transit stations.

In August 2007, local government planning directors and staff participated in work sessions during which the STAC corridors within their respective jurisdictions were reviewed. Meeting participants discussed local land use, development patterns and market opportunities as well as potential regional transit investment scenarios. At the September 10, 2007, STAC meeting, several of these planning professionals described the recommendations for rail investments as being consistent with local governments' plans. This confirms that land use planning in the region is prepared to plan for major transit investment, and that the seeds have been planted for more transit-friendly development which will support those transit investments. Maintaining and developing the highest level of consistency between transit investments and land use plans represents an ongoing challenge, which must continue to be

addressed as a major priority for local governments and the region's planners.

STAC members were also interested in how their recommendations might coordinate with other plans and initiatives for transportation options that might be extended to commuters coming into our region from communities such as Burlington, Hillsborough, Garner and Selma: all of which are along the North Carolina Railroad (NCRR) corridor. Some of these communities are very interested in commuter rail service, most notably Hillsborough, where a citizen group is actively lobbying for the re-establishment of a passenger stop in their town.

In October 2007, the NCRR announced the commencement of a Shared Track Expansion Study to determine track expansion feasibility, costs and standards for commuter (rush hour) rail service. In addition to communities along the NCRR between Burlington and Goldsboro, the study scope includes the University Railroad, a short rail corridor between Hillsborough and downtown Carrboro/Chapel Hill, currently used to deliver coal to the university power plant. The NCRR study is looking at the infrastructure improvements that would need to be made in order to support four trains during the AM and PM peak periods, plus one mid-day train, from Burlington to Goldsboro. The study does not identify an agency for operating the service. NCRR has indicated that the study is not intended to be a substitute for state, local or regional planning, such as the work that the STAC and the MPOs may undertake. It is meant to complement NCRR's planning efforts by assessing the feasibility and additional infrastructure required to operate rail transit within the freight rail corridor. Findings are anticipated to be released by summer 2008. (For more information on the NCRR study see Appendix D; for a map of the NCRR study corridor,

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see page A-27 of the appendices.)

The STAC recommendations will also need to be integrated and coordinated with the balance of the transportation projects and needs that the MPOs will include in their LRTPs. One important aspect will be demonstrating that the entire plan, including the Regional Transit Vision Plan, is financially feasible. There must be a reasonable source of funding available to implement each project in the LRTP. All of the projects included in the LRTP have a cost estimate that includes construction, operation and maintenance costs. The LRTP also includes an identification of revenue to pay for the proposed projects and there must be a reasonable expectation that these revenue sources will be realized. The LRTP can include new non-traditional revenue sources such as toll roads and additional fuel taxes. Major transit investments being considered for the 2035 LRTP will be evaluated for cost and a revenue source must be identified. Projects for which the MPOs cannot demonstrate

available revenue can be included as “unfunded” projects, that is, tabled until the next planning update cycle. A feasible financial plan for the Regional Transit Vision Plan is outlined in Section 7, along with additional recommendations for implementation. The Regional Transit Vision Plan represents the STAC recommendations based on current information and expectations. However, just as LRTPs are routinely updated, the Vision Plan will need to be revisited and updated. For example, a corridor for which express commuter bus service is recommended may in the future develop to the point where rail service will more effectively serve the travel needs. Rail corridors may need to be extended, or spur lines for rail transit may need to be added to the system to serve heavy demand just off the corridors included in the Vision Plan. The Triangle will continue to grow and change, and the Vision Plan will also need to grow and change to continue to guide transit investments in the region.