

**PHASE I REGIONAL RAIL SYSTEM
DURHAM AND WAKE COUNTIES, NORTH CAROLINA
FINAL ENVIRONMENTAL IMPACT STATEMENT AND
SECTION 4(F) EVALUATION**

SUMMARY

prepared by the

**US DEPARTMENT OF TRANSPORTATION (USDOT)
FEDERAL TRANSIT ADMINISTRATION (FTA)**

and the

TRIANGLE TRANSIT AUTHORITY (TTA)

cooperating agency

FEDERAL RAILROAD ADMINISTRATION (FRA)

The complete Final Environmental Impact Statement and Section 4(f) Evaluation is available for public review at the following locations:

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Copies of the complete Final Environmental Impact Statement and Section 4(f) Evaluation also were supplied to numerous federal and state regulatory agencies, Triangle area regional planning organizations, municipal and county government staff, railroads and public transportation providers serving the Triangle, and university officials.

A CD-ROM containing the complete Final Environmental Impact Statement and Section 4(f) Evaluation may be obtained from the Triangle Transit Authority at no charge. A complete printed copy, volumes 1, 2, and 3, also may be purchased for approximately \$100. Contact Ms. Carolyn Hasan, at (919) 485-7474 for more information.

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**Phase I Regional Rail System
Durham and Wake Counties, North Carolina**

**Final Environmental Impact Statement
and Section 4(f) Evaluation
Summary**

The existing transportation system is not capable of meeting the current mobility needs in the transportation corridor connecting Durham, Research Triangle Park (RTP), Raleigh, and North Raleigh. The Research Triangle Regional Public Transportation Authority (known locally as the Triangle Transit Authority or “TTA”) has conducted the Preliminary Engineering and Environmental Impact Statement (PE/EIS) phase of development of the Phase I Regional Rail System for the Triangle Region. The project involves development of a regional rail service in the Durham/RTP/Raleigh/North Raleigh corridor.

The Final Environmental Impact Statement (FEIS) is designed to:

- Identify the Locally Preferred Alternative (LPA) for implementation and the reasons for its selection;
- Respond to comments made by the public and government agencies on the Draft Environmental Impact Statement (DEIS);
- Present the engineering and conceptual design that defines the LPA and supports the FEIS analysis and evaluation;
- Present the analysis and study needed to identify social, economic, and environmental impacts and means to avoid, minimize, and mitigate adverse impacts for the LPA and two additional termini options; and
- Identify a financial plan for implementing the project.

This summary highlights the contents and findings of the FEIS. It is organized into the following sections:

- [Project Background and Description](#);
- [Purpose of the Final Environmental Impact Statement](#);
- [Need for Transportation Improvements](#);
- [Alternatives Considered](#);
- [Transportation and Traffic Impacts](#);
- [Environmental Consequences](#);
- [Financial Analysis](#);
- [Evaluation](#);

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- [Comments, Consultation, and Coordination](#);
 - [Section 4\(f\) Evaluation](#); and
 - [Issues to be Resolved](#).

The intent of the summary, in addition to providing a basic overview of the project and process, is to highlight the components of the LPA.

S.1 Project Background and Description

The Phase I Regional Rail System Environmental Impact Statement process is a direct outgrowth of the *Triangle Fixed Guideway Study*. That study was conducted in three phases:

- Phase I - Study Design;
- Phase II - Regional Analysis and Current Trend Future in 2020; and
- Phase III - Land Use and Transportation Alternatives.

The purpose of the study was to determine the feasibility of a fixed-guideway transportation system in the Triangle Region. Through examination of the land use trends in the region and the development and evaluation of several alternatives, this study concluded that the most effective alternative for the Triangle Region was a regional rail system with the potential for future extensions or phases.

Following the selection of the Regional Rail alternative as the preferred major investment alternative, conceptual engineering studies were conducted to determine trackwork options for the proposed Regional Rail service and existing rail operations, which would share the use of the available railroad right-of-way. The results of the studies confirmed that a shared track would cause substantial delays to both the proposed Regional Rail service and current rail operations. Several functional design alternatives and more detailed capital cost estimates were subsequently prepared. To assist local governments, the public, and the development community, the TTA and its state and local government partners and other major stakeholders developed *Station Area Development Guidelines* in 1997.

Subsequent to the selection of Regional Rail as the preferred investment, the TTA prepared the Documentation of Major Investment Study that summarized the findings of the studies described above. Both area Metropolitan Planning Organizations (MPO), Durham-Chapel Hill-Carrboro (DCHC) MPO and the Capital Area MPO (CAMPO) voted to adopt the results of the Major Investment Study and amended their Metropolitan Transportation Improvement Programs to include the Phase I Regional Rail System. The North Carolina Board of Transportation also approved amendments to the 1997-2003 State Transportation Improvement Program (STIP) to include the Phase I Regional Rail System. The Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) approved the amended STIP, including the Regional Rail project. The TTA then pursued the next phase of the corridor development process (i.e., PE/EIS) for Phase I of the Regional Rail System. The first step of the Phase I Regional Rail System PE/EIS process was the preparation of a DEIS. The release of the FEIS, and shortly thereafter a Record of Decision, concludes the PE/EIS process.

The DEIS evaluated four rail alternatives. Rail alternatives evaluated in the DEIS consisted of:

- A low-cost, one-track alternative utilizing a combination of existing and new track along an initial segment of the corridor;

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- A one-track alternative that would provide for increased track spacing and new track along the full length of the corridor;
 - A two-track alternative also with increased track spacing and new track along the full length of the corridor; and
 - An alignment alternative developed by the North Carolina Department of Transportation's (NCDOT) Rail Division in coordination with the TTA that would provide for two-track Regional Rail service, and the potential for a separate two-track freight and intercity passenger service at the highest possible speed within the existing right-of-way. Many of the objectives addressed by this alternative were satisfied by the other alternatives, but not all of them.

Each DEIS alternative included a Minimum Operable Segment (MOS) and one or more pairs of terminal station options. An MOS is the shortest alignment that is cost-effective, financially feasible, and that would have a substantial effect on the transportation problems in the corridor. The MOS alignment used in the DEIS generally paralleled NC 147 and NC 54, beginning at 9th Street in Durham, passing through RTP, Morrisville, Cary, and terminating in downtown Raleigh. The MOS, plus an extension north from downtown Raleigh to Spring Forest Road and an extension to Duke Medical Center to the west, comprised the proposed Phase I System evaluated in the DEIS. A Phase II extension to Durant Road in North Raleigh also was considered in the DEIS.

As required by the FTA, a No-Build Alternative and a Transportation Systems Management (TSM) Alternative were also evaluated in the DEIS. The No-Build Alternative consists of:

- The existing transportation facilities; and
- Committed transportation improvements, including projects under construction, projects in the STIP scheduled for completion by 2025, and bus service improvements to which area transit providers have made financial commitments.

The No-Build Alternative provides a basis for establishing the environmental impact of the build alternatives. The TSM Alternative is a low-capital-cost approach to improving existing transit services and facilities in the corridor. This alternative is the baseline against which the cost-effectiveness of the Regional Rail project is measured. The No-Build and the TSM alternatives are described in greater detail in [Sections S.4.4](#) and [S.4.5](#). They are also compared against the Regional Rail alternatives assessed in the FEIS.

Following the release of the DEIS and a public and government agency review period that included public hearings, the TTA Board of Trustees selected the LPA. The LPA is the local decision-makers' preferred alternative from among those evaluated in the DEIS. The LPA consists of a double-track line with 16 stations beginning at Duke Medical Center in Durham and ending at Spring Forest Road in Raleigh. The technology to be used is a diesel multiple unit (DMU), a self-propelled bi-directional vehicle. The project will include:

- Trackwork;
- Passenger stations;
- Park-and-ride lots;
- A maintenance facility and storage yard for the DMUs and equipment to be used to maintain the system's trackwork and facilities; and
- A feeder bus system.

In addition to the LPA, the FEIS evaluates two additional eastern terminus options at NE Regional Center and Durant Road. These Regional Rail alternatives are contrasted with the TSM and No-Build Alternatives.

S.2 Purpose of the Final Environmental Impact Statement

The purposes of the TTA Regional Rail System FEIS are to:

- Identify the LPA;
- Respond to DEIS comments; and
- Describe the project, its environmental impact, planned impact mitigation, and a financial plan.

The FEIS provides the basis for a Record of Decision (ROD) and the starting point for final design. The identification and analysis of impacts for the Regional Rail project is necessary to meet the requirements of the National Environmental Policy Act (NEPA) of 1969. The preparation of the FEIS for the project ensures that the LPA's transportation and environmental impacts are assessed, mitigation measures are identified, and that public participation and comments are considered. The evaluation component of the FEIS helps to ensure that the costs, benefits, and tradeoffs among the alternatives are addressed according to FTA requirements.

S.3 Need for Transportation Improvements

This section summarizes the need for transportation improvements in the Triangle Region and describes the purpose of the proposed project. It describes:

- A proposed project corridor;
- Specific transportation problems to be addressed by Regional Rail; and
- The goals and objectives of Regional Rail.

Chapter 1 of the DEIS describes the purpose and need of Regional Rail in detail.

S.3.1 Description of the Project Corridor

The Triangle Region encompasses Wake, Durham, and Orange counties; these counties are in the north-central portion of the state of North Carolina. Regional Rail would serve Wake and Durham counties. The project corridor extends from western Durham through Durham to RTP, Morrisville, Cary, Raleigh, and terminates in North Raleigh. The corridor is approximately 35 miles long. The corridor generally parallels NC 147 (Durham Freeway), I-40, NC 54, and US 1 (Capital Boulevard) — the major regional highways serving the corridor. The corridor includes the municipalities of Durham, Morrisville, Cary, and Raleigh. The project corridor is shown in [Figure S-1](#).

The project corridor is extensively developed with diverse land uses. The corridor includes a mixture of land uses including industrial, residential, institutional, and commercial offices. Much of the development is centered on the two larger cities of Durham and Raleigh, and it then extends out to smaller communities including Morrisville and Cary. RTP is a major employment center between Raleigh and Durham. Sparse development exists along the corridor just north and south of RTP. In these areas, single-family and light-industrial land uses are mixed. At the northern end of the corridor in northeast Raleigh, pockets of industrial and vacant land are predominant. There are numerous distinct communities and activity-generating employment centers spread throughout the corridor.

The corridor contains several centers of high activity — a unique feature of the Regional Rail corridor. These activity centers have a dense concentration of mixed land uses, and they generate a large number of trips. Many of these trips are employment related. However, the mixed-use nature of these centers means that other trip purposes, such as shopping and recreational, also are generated in these centers. These activity centers represent a concentration of residential, business, and industrial land uses. All of these activity centers would be served by the LPA.

S.3.2 Transportation Facilities and Services in the Corridor

The major streets and highways in the project area include I-40, NC 147 (Durham Freeway), NC 54, US 70, I-540 (Outer Loop), I-440, US 1 (Capital Boulevard), Wake Forest Road-Falls of Neuse Road, and Atlantic Avenue.

Several transit systems provide bus service in the region. These include the Durham Area Transit Authority (DATA), Duke University Transit, Capital Area Transit (CAT), North Carolina State University Wolfline, Chapel Hill Transit (CHT), Orange Public Transportation (OPT), and the TTA. Of these, CHT and OPT operate outside of the project corridor.

Other transportation in the area includes:

- Raleigh-Durham International Airport;
- Amtrak; and
- Carolina Trailways.

Raleigh-Durham International Airport is in the heart of the Triangle Region and served by 14 major airlines at two terminals.

Amtrak has two trains that serve the Triangle area: the Piedmont and the Carolinian. Both Amtrak trains provide daily service. The Piedmont is based in Raleigh and operates between Raleigh and Charlotte. The Carolinian runs between Charlotte, North Carolina, and New York City, serving the same cities as the Piedmont before it continues out of state.

Carolina Trailways, a wholly owned subsidiary of Greyhound, operates 68 passenger coaches throughout the Eastern United States including North Carolina. Carolina Trailways operates 16 trips per day between Raleigh and Durham, seven of which serve Chapel Hill.

There are numerous existing and proposed bikeways and greenways within the Regional Rail corridor. At least one bikeway or greenway would serve almost every transit station under consideration. Greenways are off-road trails designed for use by bicycles and pedestrians.

S.3.3 Specific Transportation Needs in the Corridor

The existing transit services in the region do not offer sufficient capacity, frequent service, or competitive travel times. Although local and some regional services are present and serve many needs well, the existing transit service is not a desirable choice for many residents in the region. For many residents, the automobile is not only a more convenient choice, it is the only choice. Thus, the following issues are substantial transportation-related problems the Triangle Region is experiencing, or likely will experience, that will affect the Triangle Region's livability and mobility:

- Lack of regional travel choices;
- Regional development patterns that can result in a low community identity and inefficient use of land; and

- Low transit capacity and usage in congested regional travel corridors.

S.3.4 Transportation Goals and Objectives

Transportation improvements are needed in the project corridor to alleviate travel-related problems and to meet travel demands resulting from growth in population and employment. Current and future improvements to the highway system cannot alone accommodate projected demand, nor will they provide the mobility options inherent in a multimodal transportation system. Even with the implementation of the planned highway improvements in the Triangle Region as reflected in the long-range transportation plan for the region, congestion will still exist on most of the roadway systems in the corridor, and transit travel times will remain non-competitive with the automobile. However, by developing Regional Rail in the corridor in combination with the planned highway improvements, the capacity and mobility options necessary to accommodate future growth effectively can be achieved.

Based on the needs identified in [Section S.3.3](#), three sets of goals and objectives were established for the Regional Rail project. They are in [Table S-1](#). The Regional Rail project’s effectiveness at achieving each goal is summarized in [Section S.8](#).

S.4 Alternatives Considered

This section first describes the selection of Regional Rail as the preferred major investment for transit improvements in the corridor and then the alternatives evaluated in the DEIS. This discussion is followed by a description of the alternatives evaluated in the FEIS, including the LPA. The next two sections describe the No-Build and the TSM alternatives. The final section describes the capital and operating costs of the LPA and several Regional Rail termini options. These discussions are presented in detail in Chapter 2 of the FEIS.

S.4.1 Selection of the Regional Rail Alternative

The decision to implement a regional rail system for the Triangle Region was made after the completion of the *Triangle Fixed Guideway Study* (Phases I, II, and III) and several follow-up studies. During this process, three new alternatives were developed and evaluated prior to the decision to select Regional Rail as the preferred major investment.

Table S-1. Project Goals and Objectives

Goal Category	Goal Statement	Objectives
Travel Choice	Provide high quality and time competitive regional transit service.	<ol style="list-style-type: none"> 1. Increase the availability of public transit to regional activity centers. 2. Improve reliability and frequency of public transit service at regional activity centers. 3. Increase the mobility of transit dependent populations. 4. Reduce transit travel time. 5. Simplify and improve transfers between regional and local transit service.
Development Patterns	Support efforts in the Triangle Region to encourage more compact development.	Support and reinforce local and regional development plans that encourage more compact forms of development in order to: <ol style="list-style-type: none"> 1. Reinforce community identity; and 2. Facilitate infill and redevelopment opportunities.
Congestion	Increase quantity and usage of transit service in congested regional travel corridors.	Use transit improvements to contribute to: <ol style="list-style-type: none"> 1. Higher regional travel transit capacity (number of seats); and 2. Regional ridership increases.

Triangle Fixed-Guideway Study

The *Triangle Fixed Guideway Study* was designed to examine the regional economic opportunities and identify potential locations for growth, define corridors that can connect the growth locations, and propose changes in land use that must take place in order to support transit.

The study was completed in three phases between December 1992 and February 1995. The three modal alternatives evaluated were:

- **Light Rail Alternative.** The Light Rail Alternative consisted of a fixed guideway system operating light rail transit (LRT) vehicles on a continuous route that served destinations between Chapel Hill and Duke University; between downtown Durham/Duke University, RTP, Raleigh-Durham Airport, Cary, and downtown Raleigh; and between downtown Raleigh and northeast Raleigh. An extended system connecting North Raleigh and Chapel Hill directly with RTP also was examined.
- **Regional Rail Alternative.** The Regional Rail Alternative consisted of Regional Rail on a fixed guideway utilizing diesel-powered, bi-directional articulated rail cars operating primarily on existing rail lines. Regional Rail was assumed to operate on tracks within existing railroad rights-of-way, except in downtown Chapel Hill/Carrboro where new track was assumed to be constructed in the street. There was an extended system proposed, as well, which would connect to Hillsborough (west of Durham).
- **Busway/HOV Lane Alternative.** The Busway/HOV Lane Alternative consisted of a network of lanes or roads reserved for exclusive use by buses and/or high-occupancy vehicles (HOVs). Six routes were considered as potential candidates for busway/HOV lanes. Four types of busway/HOV facilities were examined.

The *Triangle Fixed Guideway Study* concluded that fixed guideway transit could alleviate some future growth impacts by helping to shape future growth patterns and by providing an alternative form of mobility for residents of the Triangle Region. The study also found that a public commitment to rail transit, in the form of future fixed guideway corridors in the official transportation plans for the region, could influence development decisions. However, it would not be until construction or even until service is in operation that major private investment in station areas is likely to be realized.

Finally, the *Triangle Fixed Guideway Study* found that the lower-volume commuter rail service and the spacing of the stations of a Regional Rail system is best suited for DMU self-propelled vehicles. A DMU self-propelled vehicle is the best technology for a lower-volume commuter rail service with a wider spacing of stations. A standard passenger locomotive and cars would be uneconomical in regard to the purchase of the equipment, fuel consumption, and maintenance.

Phased Regional Rail Plan

Because of the *Triangle Fixed Guideway Study* and based on other regional objectives and public input, the TTA developed a multi-phase *Regional Transit Plan* for the Triangle Region. The Regional Rail Alternative was selected as the preferred major investment. Phase I of that plan, which was the focus of the FEIS, would operate Regional Rail in the existing rail corridor from Duke Medical Center to downtown Raleigh within the North Carolina Railroad (NCRR) corridor and into North Raleigh within the CSX rail corridor. Shuttle and feeder bus systems would support the Regional Rail project with service to and from the rail stations.

Phase II of the *Regional Transit Plan* provides for high quality transit service between Chapel Hill/Carrboro and Durham. Phase II also includes fixed guideway service to Raleigh-Durham International Airport. Service to Durant Road is a part of Phase II and is being evaluated in the FEIS. Long-term elements of the *Regional Transit Plan* include extension of Regional Rail service to outlying communities in the region, using existing rail corridors.

Additional Studies

The TTA conducted four additional studies following the selection of Regional Rail as the preferred major investment alternative to examine Regional Rail in more detail:

- *Train Dispatching Simulations*, February 1995;
- *Proposed Commuter Operations – Revised Plant Configuration*, July 1995;
- *Preliminary Engineering for the Regional Rail Project – Phase I*, September 1996; and
- *Station Area Development Guidelines*, 1997.

MPO Adoption of the Regional Rail Alternative

Following the completion of additional technical studies, the TTA prepared the *Documentation of Major Investment Study* summarizing the findings of the *Triangle Fixed Guideway Study* and the other background studies. The region's two MPOs, NCDOT and the FTA concurred that the combined studies met the Major Investment Study (MIS) requirements of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.

S.4.2 Description of the DEIS Regional Rail Alternatives

The DEIS evaluated four trackwork configuration alternatives and several termini alternatives for Regional Rail. The alternatives used existing railroad right-of-way, leaving the right-of-way in only two locations, to serve Duke Medical Center and near downtown Raleigh for three of the four alternatives. The existing railroad right-of-way is owned generally by the NCR and operated by the Norfolk Southern Railroad. The right-of-way is owned by the CSX railroad from downtown Raleigh northward. In two locations (east Durham and between Cary and downtown Raleigh), the CSX railroad shares the right-of-way with the Norfolk Southern Railroad.

All the alternatives had a terminus in the City of Durham, served Research Triangle Park and the towns of Morrisville and Cary, and had a terminus in the City of Raleigh. Depending on the location of the terminal stations, the alternatives included 11 to 18 stations. The DEIS evaluated alternative sites for several stations. Three alternative sites were considered for the project's rail vehicle storage yard and maintenance shop site. All alternatives assumed diesel-powered, self-propelled vehicles. The alternatives also included a feeder bus system serving the rail stations and a system of local bus routes serving those areas not served by the rail system.

General Trackwork Location

The alignment for the Regional Rail alternatives evaluated in the DEIS was developed as follows:

- Durham. The alignment goes along the south side of the existing NCR railroad right-of-way. It avoids crossings for several industrial sidings and freight railroad branch lines along the north side, and avoids a mainline freight railroad crossing associated with bringing the project into the Duke Medical Center. East of Durham, a fly-over structure took the Regional Rail tracks from one side of the railroad right-of-way to the other.
- Durham to Downtown Raleigh. This location goes along the east or north side of the railroad right-of-way to avoid industrial sidings and the need for a fly-over structure in downtown Cary at a junction between the NCR and the CSX railroad. In downtown Raleigh, a fly-over structure took the Regional Rail tracks from the north side of the NCR railroad right-of-way to the east side of the CSX right-of-way.

- Downtown Raleigh Northward. This location goes along the east side of the railroad right-of-way to avoid industrial tracks on the west side and minimize impacts on a CSX railroad yard. It includes a fly-over structure over the Norfolk Southern (NS) tracks at Edgeton Junction near Capital Boulevard north of downtown Raleigh. The Regional Rail tracks remained on the east side of the CSX railroad right-of-way until the end of the project.

Terminal Station Options

For the DEIS Regional Rail alternatives, there were five possible combinations of terminal stations that could be used with any trackwork location. [Table S-2](#) identifies these combinations. The basic Phase I alignment extended from Duke Medical Center in Durham to Spring Forest Road in Raleigh. These termini are identified in the Phase I Regional Rail plan adopted by the MPO. A Phase II extension included in the DEIS study went from Spring Forest Road to Durant Road in North Raleigh. The merits of this extension were studied at the request of the City of Raleigh. At the request of Duke University, the merits of terminating the project at 9th Street in Durham also were studied.

Trackwork Configuration Alternatives

The four trackwork configuration alternatives were named Alternatives A, B1, B2, and C and were defined as follows:

- Alternative A. A low-cost one-track design, including the minimum amount of second track where needed for two trains traveling in opposite directions to pass. In general, the lower cost was achieved by:
 - Using a single track at-grade crossing of the D&S Junction in east Durham;
 - Intermittent use of one of two existing track locations and relocation of freight tracks between downtown Cary and downtown Raleigh; and
 - A common use of 15-foot track separation, including the use of an existing but currently unused track bed in North Raleigh.

A second freight track was not precluded; however, the cost and environmental impact of adding a second freight track were greater than the other alternatives.

- Alternative B1. A one-track alternative that included an extensive D&S Junction fly-over, construction of new Regional Rail track between downtown Cary and downtown Raleigh, and primary use of 25-foot track separations. The passing sidings were longer in length and reduced the chance that a single delayed train could cause system-wide delays. This alternative was designed to permit a second freight/intercity passenger track throughout the corridor.

Table S-2. Termini Locations Evaluated in the DEIS

Termini		Length of Route	Phase
West End in Durham	East End in Raleigh		
9th Street/Duke East	Spring Forest Rd.	34.0 miles	I
Duke Medical Center	Spring Forest Rd.	35.0 miles	I
9th Street/Duke East	Durant Rd.	37.4 miles	II
Duke Medical Center	Durant Rd.	38.4 miles	I & II
9th Street in Durham	Downtown Raleigh	27.5 miles	I (MOS)

-
- Alternative B2. An alternative that included the same features as Alternative B1 plus two tracks for the project's full-length except for a 1,200-foot single-track section in downtown Raleigh.
 - Alternative C. A two-track alternative that was developed for evaluation by the NCDOT Rail Division in cooperation with the TTA. This alternative adjusted the Regional Rail track location to better accommodate future improvements to the freight/intercity tracks and allowed for planned higher intercity passenger train speeds.

This alternative also included all Regional Rail design characteristics requested by the freight railroads and provided for a future second freight/intercity track with the minimal cost impacts. Many of the objectives addressed by this alternative were satisfied by the other alternatives, but not all of them.

Alternatives B1, B2, and C were designed to permit a second freight/intercity passenger track from Durham to downtown Cary and from downtown Raleigh to North Raleigh (two freight/intercity tracks currently exist between downtown Cary and downtown Raleigh).

Station Alternatives

The Regional Rail project in the DEIS included 11 to 18 stations, depending on project length. The station locations in the DEIS were selected after comprehensive study and analysis and as input was received from major public and private stakeholders through a series of workshops held in the corridor area. The preliminary station designs were designed with support services and features for the comfort and safety of transit passengers. Most of the stations provided on-site parking for passengers arriving by auto.

Yard and Shop Alternatives

Regional Rail will include a yard and shop to support operations of the Regional Rail project. The yard and shop will be used as the primary repair and maintenance shop for the transit vehicles. In addition, the yard and shop will serve as a storage area for transit vehicles that are not in service. The yard and shop will serve as the point of dispatch for all trains. Three potential sites were considered in the DEIS: Wrenn Road and Ellis Road, both in Durham County and a site in Morrisville on NC 54.

Costs

Total capital costs (in 1999 dollars) were calculated for each DEIS alternative. The costs for the DEIS Regional Rail alternatives ranged from \$459.0 million with the MOS under Alternative A to \$831.7 million with Duke Medical Center to Durant Road under Alternative C. Annual operating and maintenance (O&M) cost estimates (1999 dollars) were prepared for each DEIS alternative based on the bus and Regional Rail operating plans and cost models. The total annual O&M cost estimates for the DEIS Regional Rail alternatives ranged from \$67.9 million to \$82.6 million.

S.4.3 Description of the Locally Preferred Alternative

The LPA (see [Figure S-1](#)) was selected by the TTA's Board of Trustees based on:

- The findings of the DEIS;
- Consideration of the DEIS review comments; and
- Several additional station and trackwork location studies conducted in response to DEIS review comments.

The LPA generally is a combination of the two-track Alternatives B2 and C of the DEIS. As shown in [Table S-3](#), the western terminus will be at Duke Medical Center in Durham and the eastern terminus will be at Spring Forest Road in Raleigh. The LPA includes 16 stations. In addition to Spring Forest Road, the FEIS also evaluates two additional eastern terminus options:

- NE Regional Center; and
- Durant Road.

The LPA includes a feeder bus system, a yard, and shop. The preferred vehicle is a DMU. Trains will operate initially at 15-minute peak-hour and 30-minute off-peak hour headways. By 2015, the TTA expects to reduce headways to 10-minutes and 20-minutes.

Morrisville Parkway, New Hope Church Road, and Millbrook Road will be grade-separated from both the freight and Regional Rail tracks. No public street or highway at-grade crossing of the railroad tracks will be closed as part of the Regional Rail project. Supplemental at-grade crossing safety measures, such as four-quadrant gates and median divided barriers, will be built at all at-grade crossings. New property access will be provided as needed to allow the closure of four private railroad crossings. The TTA will implement quiet zones in coordination with each municipality that requests quiet zones. If quiet zones cannot be used, then TTA will use wayside horns.

The remaining paragraphs of this section provide a more detailed description of the characteristics of the Locally Preferred Alternative for the Regional Rail project and the reasons for its selection.

Trackwork Location and Configuration

The LPA for the Regional Rail project is a double-track alignment for the entire corridor from Duke Medical Center to Spring Forest. There is an exception at Boylan Junction in downtown Raleigh; where a 1,600-foot length of single track will be built to avoid construction disturbance and/or relocation of existing railroad tracks between Hargett Street and Jones Street. Two tracks also would lead to the termini options at the NE Regional Center and Durant Road. A center-to-center distance of 26 feet will be maintained between the Regional Rail tracks and the adjacent freight railroad tracks for the entire length of the corridor.

Some existing railroad tracks will be moved. The LPA will maintain existing freight/intercity passenger capacity. Curve realignments at certain locations are included in the LPA to allow for future intercity passenger track improvements that would allow trains to operate at higher speeds in North Raleigh and west Raleigh, and between Cary and Durham.

The track design for the LPA differs notably from that presented in the DEIS in three locations:

1. In the Duke Medical Center Station area to provide for a station parallel to Elba Street;

Table S-3. Termini Options

Termini		Length of Route	Phase
West End in Durham	East End in Raleigh		
Duke Medical Center	Spring Forest Rd.	35.0 miles (LPA)	I
Duke Medical Center	N.E Regional Center.	36.0 miles	I & II
Duke Medical Center	Durant Rd.	38.4 miles	I & II

-
2. In the Downtown Raleigh Station area to eliminate an at-grade crossing of Boylan Avenue and to move the station platform closer to West Street; and
 3. In the Spring Forest Station area to take the track under a reactivated railroad siding between Atlantic Avenue and Spring Forest Road.

The LPA trackwork will be built in stages. The initial operating segment, 28 miles in length, will open in late 2007 between Ninth Street in Durham and Government Center in downtown Raleigh and will include 12 stations. When opened, this segment will have a single track with passing sidings. In 2011, the segment from Government Center in Raleigh to Spring Forest in North Raleigh (6 miles in length and four additional stations) and the extension from Ninth Street in Durham west to Duke Medical Center (0.7 mile in length and one additional station) will open. This segment will be double track. In 2015, the second track will be added to the initial operating segment between Ninth Street and Government Center.

Service Frequency

Trains will operate initially at 15-minute peak-period and 30-minute off-peak period headways (time between trains) for each direction of travel. Taking into account both directions of travel, trains would pass any single point along the rail line an average of every 7.5 minutes in the peak period and 15 minutes in the off-peak period. By 2015 the TTA will reduce headways in each direction of travel to 10 minutes in the peak period and 20 minutes in the off-peak period. These frequencies were selected taking into consideration expected initial and long-term ridership potential and operational funding availability.

Stations

Sixteen stations were selected for inclusion in the LPA. Two additional eastern termini are also evaluated in the FEIS. The locations and names of the stations are shown in [Figure S-1](#). The stations will be designed with support services and features for the comfort and safety of transit passengers. The features that would be standard at all the stations include:

- A four-foot high (depends upon final vehicle construction), 350-foot long platform;
- An overhead canopy over a portion of each platform;
- Pedestrian access;
- Handicapped access by either ramps or elevators;
- Handicapped parking;
- Bicycle racks (or other appropriate bicycle storage facilities);
- On-site or off-site provisions for buses;
- Protected Regional Rail track crossings for pedestrians;
- Fare collection ticket vending machines;
- Lighting;
- Security cameras;
- Public address systems;

-
- Landscaping; and
 - Protective barriers.

Most stations will have on site parking for passengers arriving by automobile. All parking will be provided in surface lots, except at the Downtown Cary and Alston Avenue/NCCU Stations, where parking structures will be constructed.

Yard and Shop

The Ellis Road site, in Durham, was selected as part of the LPA. The yard and shop are being designed initially to hold 21 two-car train sets (42 cars). Space is available to expand the facility to accommodate 41 train sets (82 cars). Its location is shown in [Figure S-1](#).

Street and Highway Grade Crossings and Separations

There are 50 existing grade crossings along the LPA. The LPA will include 44 protected at-grade crossings, the closure of four private crossings, and grade separations for Morrisville Parkway, New Hope Church Road, and Millbrook Road. The project also will pass under Hargett Street. Two additional at grade crossings would be crossed with an LPA with an alternate terminus at Durant Road in Raleigh. At all locations where the existing railroad is grade-separated, the Regional Rail project will be grade-separated.

Vehicle

Diesel multiple unit (DMU) technology was selected for the LPA. DMUs offer an attractive, cost-effective approach for operating in a freight railroad corridor. While other projects are progressing with diesel light rail vehicles (or light DMUs), the railroad companies using the Regional Rail corridor have expressed strong reservations about the safety of operating lighter vehicles, including light rail and buses, any closer than 110 feet from their freight tracks. Because the Regional Rail project will share a corridor with operating freight and passenger railroads, the DMUs for the Regional Rail project will be designed to comply with the structural requirements of Federal Railroad Administration (FRA) regulations.

The DMU trains will be bi-directional, consisting of married-pairs (two-car units) to a maximum service train length of four cars (two married pairs). A married pair will be approximately 170 feet long, 10-feet-wide, and 14.5-feet-high. The ability to use two- or four-car trains will accommodate changes in ridership demand.

The vehicles will have a seating capacity of up to 174 passengers in a two-car married pair. The vehicles will operate generally at a maximum speed of 60 miles per hour, but have the potential of reaching higher speeds.

Operational Characteristics

The LPA will operate seven days a week from approximately 6:00 a.m. to midnight. On weekdays, peak period service will operate from 6:00 a.m. to 9:30 a.m. and 3:00 p.m. to 7:00 p.m. Midday service will operate between the hours of 9:30 a.m. and 3:00 p.m. Evening service will begin at 7:00 p.m. and extend to midnight. Special events can alter the schedule.

Under the Regional Rail project, most bus routes will be coordinated with the arrivals and departures of the Regional Rail.

Although the Regional Rail project's security plan has not been completed at this time, it is expected to include a variety of features. First, the TTA has the legislative ability to establish a police force. Second, all station platforms and parking lots will be lighted and have emergency

phones or call buttons. In addition, the TTA anticipates working with local law enforcement officers to establish a presence at each station. The TTA is considering the use of video cameras for surveillance purposes. Design considerations for security systems will include effectiveness and costs to install and maintain.

Railroad operating rules generally require trains to sound the horn when approaching rail-highway grade crossings. Because the Regional Rail project involves shared highway-rail grade crossings, some federal railroad safety laws will apply to the project. Regional Rail operating practices most likely will need to conform to those of the adjacent railroad with regard to the sounding of horns. Horn sounding likely will be required of the Regional Rail trains unless waived or otherwise excepted through the designation of a quiet zone. Quiet zones, with supplemental safety measures such as four-quadrant gates, are the TTA's preferred method to mitigate horn noise. Quiet zones will eliminate horn use and noise except in emergencies. The TTA will actively pursue the implementation of quiet zones along the full length of the Regional Rail project. If quiet zones prove infeasible, the Regional Rail project will use wayside horns placed at the grade crossing rather than horns on the train. The use of wayside horns will reduce the area affected by horn noise.

Feeder Bus Network

The feeder bus network (shown in [Figure S-2](#)) was developed cooperatively by the staffs at: TTA, DATA, the City of Durham Transportation Division, CAT, the City of Raleigh Planning Department, Chapel Hill Transit, Orange County Planning, North Carolina State University, and the Town of Cary. Existing routes will be restructured to better serve Regional Rail stations, with some routes truncated at the rail stations. Routes with competing rail services will be reoriented and new routes developed to serve projected growth areas of the region. In addition, a new network of local bus service will be operated in the Cary area. Since Chapel Hill Transit (CHT) and Orange Public Transit (OPT) service areas are outside the study corridor, only minor changes were assumed for these 2025 bus networks.

Service to Raleigh-Durham International Airport will be provided by direct, nonstop shuttles operated on 15-minute headways that are coordinated with Regional Rail arrivals and departures at the Triangle Metro Center Station. Shuttle bus connections also will be made between the airport and one or both of the Cary stations and the Triangle Metro Center station.

S.4.4 No-Build Alternative

The No-Build Alternative includes transit services and highway and transit facilities that are likely to exist in 2025. It includes the existing highway network that is part of all alternatives plus the highway improvements scheduled in the State Transportation Improvement Program (STIP) for implementation between 1998 and 2004.

The transit services in the No-Build Alternative include the existing routes and schedules currently operated by the Triangle Region's transit providers. In addition, new bus service improvements to which the region's transit providers have committed also are included in the No-Build Alternative. The No-Build Alternative also assumes replacement of existing facilities and equipment when the end of their useful design life is reached.

The No-Build Alternative provides a baseline for comparing the travel benefits and environmental impact of the Regional Rail project.

S.4.5 Transportation Systems Management Alternative

The TSM Alternative is a low capital-cost approach for addressing the need for transit improvements in the Triangle Region. It assumes the implementation of the highway and transit improvements associated with the No-Build Alternative, and a further expansion of bus transit

service in the Triangle Region. The TSM Alternative provides the baseline for evaluating the cost-effectiveness of the Regional Rail project.

The peak bus requirement for the TSM Alternative would increase 152 buses over that of the No-Build Alternative to approximately 368 vehicles. Bus transit improvements under the TSM Alternative include new bus routes, longer service hours, increased bus frequency, and new transit facilities, such as park-and-ride lots, off-street transfer points, and bus maintenance facilities.

S.4.6 Costs

The total capital costs (in 2002 dollars) for each alternative evaluated are presented in [Table S-4](#). The table also shows costs by major cost item for bus and rail costs.

Capital costs in 2002 dollars for the No-Build Alternative would be \$62.6 million. The TSM Alternative would have a capital cost of \$94.3 million. The capital costs for the LPA will be \$860.9 (including both bus- and rail-related costs). The extension to a NE Regional Center Station would add \$17.8 million to the cost of the Regional Rail project above that of the LPA. The extension to the Durant Road Station would add an additional \$33.7 million above the cost with a terminus at the NE Regional Center.

Annual O&M cost estimates were prepared for each alternative based on the bus and Regional Rail operating plans and cost models. The costs are expressed in 2002 dollars. Bus and Regional Rail costs were estimated separately for each alternative. [Table S-5](#) is a summary comparison of the annual operating statistics and O&M cost estimates for the No-Build, TSM, and Regional Rail termini options.

Table S-4. Capital Cost Estimates by Termini Option (2002 dollars)

	No-Build	TSM	Termini Option		
			LPA (Duke Medical Center to Spring Forest)	Duke Medical Center to NE Regional Center	Duke Medical Center to Durant Road
Regional Rail Improvements					
Final Design			\$38,657,000	\$39,321,000	\$40,618,000
Property (ROW, stations, yard)			\$57,303,000	\$60,922,000	\$64,744,000
Grading and Structures: 15 minute service			\$206,082,000	\$208,306,000	\$213,783,000
Grading and Structures: 10 minute service			\$36,642,000	\$36,642,000	\$36,642,000
Stations			\$76,193,000	\$80,492,000	\$86,822,000
Yard and Shop			\$26,642,000	\$26,642,000	\$26,642,000
Trackwork for 15 minute service			\$70,659,000	\$73,842,000	\$78,618,000
Trackwork for 10 minute service			\$13,308,000	\$13,308,000	\$13,308,000
Systems			\$63,196,000	\$66,262,000	\$76,310,000
Vehicles for 15 minute service			\$97,084,000	\$97,084,000	\$97,084,000
Vehicles for 10 minute service			\$38,752,000	\$38,752,000	\$38,752,000
Regional Rail Subtotal			\$724,509,000	\$741,565,000	\$774,663,000
Other TTA CIP	\$42,745,000	\$58,819,000	\$44,094,000	\$44,094,000	\$44,094,000
Bus Replacement and Expansion	\$19,857,000	\$35,471,000	\$32,056,000	\$32,056,000	\$32,056,000
Rail Repair and Rehabilitation			\$60,214,000	\$60,985,000	\$61,615,000
Total (Bus, Rail)	\$62,602,000	\$94,290,000	\$860,873,000	\$878,700,000	\$912,428,000

Table S-5. Comparison of 2025 Annual Operating Statistics and O&M Cost Estimates (2002 dollars) for Termini Options¹

Mode	Statistic	No-Build	TSM	Termini Options		
				Duke Medical Center to Spring Forest	Duke Medical Center to NE Regional Center	Duke Medical Center to Durant Road
Bus	Peak Buses	216	368	344	344	344
	Annual Revenue Bus-Hrs.	552,600	1,100,800	1,016,600	1,016,600	1,016,600
	Annual Revenue Mile	8,171,700	16,419,700	14,803,100	14,803,100	14,803,100
	Boardings	23,460,000	32,171,600	26,726,000	26,786,300	26,815,600
	Annual O&M Cost	\$42,706,400	\$75,555,400	\$68,583,300	\$68,583,300	\$68,583,300
	Cost/Bus-Hour	\$77.28	\$68.64	\$67.46	\$67.46	\$67.46
	Cost/Bus-Mile	\$5.23	\$4.60	\$4.63	\$4.63	\$4.63
Cost/Passenger	\$1.82	\$2.35	\$2.57	\$2.56	\$2.56	
Rail	Peak Cars			30	30	32
	Annual Revenue Train-Hrs.			87,500	88,000	87,200
	Annual Revenue Train-Mile			1,899,600	1,982,600	2,081,100
	Boardings			8,157,700	8,348,200	8,415,400
	Annual O&M Cost			\$18,902,200	\$19,382,200	\$20,318,100
	Cost/Train-Hour			\$216.03	\$220.25	\$233.01
	Cost/Train-Mile			\$9.95	\$9.78	\$9.76
Cost/Passenger			\$2.32	\$2.32	\$2.41	
Total Annual O&M Cost		\$42,706,400	\$75,555,400	\$87,485,500	\$87,965,500	\$88,901,400
Total Cost/Passenger		\$1.82	\$2.35	\$2.51	\$2.50	\$2.52
Difference from No-Build		--	\$32,849,000	\$44,779,100	\$45,259,100	\$46,195,000
Difference from TSM		(\$32,849,000)	--	\$11,930,100	\$12,410,100	\$13,346,000

¹ These costs reflect total regional costs, including all the Triangle Region's transit providers.

S.5 Transportation and Traffic Impacts

This section summarizes the transportation and traffic impacts of the LPA for the Regional Rail project (as well as two Regional Rail eastern termini options) in comparison to the No-Build and TSM alternatives. These impacts are described in detail in Chapter 4 of the FEIS.

S.5.1 Public Transportation Impacts

The public transportation impact of each alternative is measured by its projected effect on transit levels of service and ridership. The effectiveness of each alternative in improving the level of transit service in the corridor is influenced by:

- The geographic coverage each alternative provides;
- The availability and frequency of service operated in those areas served;
- The time it takes to travel by transit from one point to another in the corridor;
- The opportunity for and ease of making transfers to complete a trip; and
- The reliability and safety of the service.

An improved level of service should result in increased transit ridership. By measuring ridership changes, the effectiveness of the alternative in improving the level of service in the corridor can be determined. The Regional Rail project is contrasted with the No-Build and TSM alternatives.

Level of Service

Under the Regional Rail project, the type and quality of transit service available within the corridor will be improved. The Regional Rail project will introduce new fixed-guideway transit service operating via separated right-of-way that will provide faster and substantially more reliable transit service to Triangle area residents. The high-frequency service will be available throughout most of the day. In addition, large park-and-ride facilities or a feeder bus service will expand the area from which people can easily reach the service. The TSM Alternative and the Regional Rail project will provide transit service to a larger area than is served by buses under the No-Build Alternative. There are several areas of the region that, when compared to the No-Build Alternative, will have new or expanded bus service through either the TSM or the Regional Rail project.

The number of total bus route miles in the Triangle Region (calculated as the sum of each individual bus route’s round-trip mileage) will increase from 1,331 miles per day in 2002 to:

- 1,532 in 2025 under the No-Build Alternative;
- 1,854 miles in 2025 under the TSM Alternative; and
- 1,727 miles in 2025 with the Regional Rail project.

Regional Rail will provide lower in-vehicle transit travel times between many areas of the Triangle than either the No-Build or TSM alternatives.

The inconveniences of transferring between modes of transportation would be fewer with Regional Rail as compared to the No-Build and TSM alternatives because of the reliability of the Regional Rail’s schedule. This reliability allows timed-transfers between buses and trains at multiple locations (e.g., downtown Durham, RTP, Cary, and downtown Raleigh). This is difficult when regional bus routes operate in mixed traffic, as they would under the No-Build and TSM alternatives. Further, Regional Rail will provide a single continuous route via rail for passengers between Durham and North Raleigh and stations in between; in contrast, the TSM Alternative would require transfers between multiple routes, particularly for trips to or from Cary, Morrisville, and North Raleigh.

Patronage Impacts

Under the TSM Alternative and the Regional Rail project, the number of transit trips will increase over the No-Build Alternative (See [Table S-6.](#)). The TSM Alternative would increase the number of transit trips by 16,200 to 71,500. The increase in transit trips, however, will be greater for the Regional Rail project than for the TSM Alternative. The increase over the TSM Alternative will be 9,700 trips daily with the LPA. An additional 800 trips (over the LPA) would result from a terminus at the NE Regional Center. An extension to Durant Road would result in 200 additional trips over the daily total resulting from a terminus at NE Regional Center.

Table S-6. Comparison of 2025 Total and New Daily Transit Trips

Alternative	Work	Non-Work	Total	Change From	
				No-Build	TSM
No-Build	26,700	28,600	55,300	–	–
TSM	36,200	35,300	71,500	16,200	–
Regional Rail Project					
Locally Preferred Alternative (Duke Medical Center to Spring Forest)	43,800	37,400	81,200	25,900	9,700
Duke Medical Center to NE Regional Center	44,400	37,600	82,000	26,700	10,500
Duke Medical Center to Durant Road	44,600	37,600	82,200	26,900	10,700

S.5.2 Street, Highway, and Traffic Impacts

The Regional Rail project has the potential for both positive and negative impacts on the street and highway system. On a regional level, the transit improvements of the Regional Rail project will improve mobility by providing an alternative to automobile travel. As a result, encouraging a shift in trips from automobile to transit could reduce congestion. However, at a localized corridor level negative impacts can result from the presence of trains at rail/highway grade crossings, modification of the street system to accommodate the Regional Rail project's alignment, and through increased automobile and feeder bus traffic in station areas.

New Grade Separations and Crossing Closures

Grade separations are included in the Regional Rail project at Morrisville Parkway, New Hope Church Road, and Millbrook Road. All three grade separations are included in the LPA (Duke Medical to Spring Forest) and the other two termini options. Four private crossings will be closed with the LPA and the two termini options: CP&L, WPTF access, PSNC access, and a private industrial access. Access to these properties will be replaced.

Regional Impacts on Travel and Congestion

Compared to the No-Build Alternative (66,465,000 daily vehicle-miles traveled in 2025), a small reduction (to between 65,723,000 and 65,837,000 daily vehicle-miles traveled) in regional auto travel would result from implementation of any of the Regional Rail termini options. The region in this case is the eight-county region contained in the Triangle regional travel-forecasting model, including: Wake, Durham, and Orange counties and parts of Chatham, Harnett, Johnston, Franklin, and Granville counties.

The daily regional vehicle-hours of travel in the region would decrease from 2,078,000 hours to between 2,042,000 and 2,062,000 hours. The highest benefit from the Regional Rail project in terms of reduction in vehicle-miles would be during a.m. and p.m. peak hours when transit would be carrying a higher percentage of the total morning or afternoon work trips. The highest benefit also would be felt in the areas immediately surrounding the Regional Rail corridor.

Train Operational Impacts at Grade Crossings

The Regional Rail project will increase the number of trains at existing highway-railroad grade crossings. There are 48 grade crossings within the corridor that will be crossed by the LPA, or with an eastern terminus at NE Regional Center. There are an additional two crossings with the extension to Durant Road. Warning devices consisting of railroad-type flashing light signals and automatic gates currently control vehicular and pedestrian traffic at most of these crossings. Four private crossings will be closed with the LPA and the two eastern termini options. Three existing at-grade crossings will become grade-separated. Both the freight-passenger and the Regional Rail tracks will be separated from the crossing road at these crossings.

The Regional Rail project will pass under Hargett Street in downtown Raleigh. The freight tracks will continue to cross Hargett Street at grade. All existing grade separations of roads and railroad tracks will be retained. The 43 crossings not closed or grade-separated will be upgraded with four-quadrant gates and/or median divided barriers. All existing crossing devices will be repositioned as necessary to encompass the Regional Rail tracks; this will be constructed generally parallel to the existing railroad tracks. At these crossings, an approaching train (railroad or Regional Rail) will activate the flashing signals and automatic gates. This will close the roadway until the train has traversed the crossing.

In 2015, Regional Rail trains will operate in each direction at 10-minute headways during the peak period and 20-minute headways during off-peak periods. Between the opening of the Regional Rail project and 2015, trains will operate at 15-minute headways during the peak period and 30 minutes during off-peak periods. With 10-minute headways, the gates will close every

five minutes on the average. When a single train passes through a crossing, the gates close for approximately 50 seconds at most crossings. When trains from opposite directions pass through a crossing at nearly the same time, the gate closure time could rise to as much as 95 seconds. These train crossings will increase vehicular traffic delay and result in queuing of vehicles, which can affect adjacent intersections.

The Transportation Research Board's 1994 *Highway Capacity Manual* (HCM) provides methods to determine level of service (LOS) at intersections. LOS is based on the average time that motorists are delayed as they pass through an intersection. LOS has six grades; each is represented by a letter - (A to F). LOS A represents the shortest delay and LOS F represents substantial delay. LOS A to D is considered desirable during the peak travel hours in urban areas.

Of the 43 at-grade railroad/highway crossing locations, no locations will operate at unacceptable levels of service (that is, LOS E or F) in 2008 with either the No-Build or the Regional Rail project. The 2008 Regional Rail project level of service assumes the 2025 level of service (10-minute peak hour headways and 20-minute non-peak hour headways). Therefore, no highway improvements will be needed at the grade crossings to accommodate the additional gate closures of the Regional Rail project.

A capacity analysis was conducted for each signalized intersection adjacent to the crossings. With the Regional Rail project, five intersections will be operating at undesirable levels of service (that is, LOS E or F) in 2008. Capacity improvements will be built at seven intersections, including the five with undesirable levels of service in 2008. All of these improvements are turn lanes. Integration of the intersection traffic signals with gate closures will reduce the effectiveness of any coordinated signal system with which the affected intersection is associated. A program to mitigate this impact will be developed during final design and implemented prior to the commencement of rail service. In addition to the signalized intersections, several unsignalized intersections might be affected by gate closures. A program to mitigate these impacts will be developed during final design and implemented prior to the commencement of rail service.

The required studies, and the development and implementation of final mitigation for traffic impacts, will be coordinated with local municipalities and the NCDOT under the TTA's planned mitigation stakeholder involvement program.

Modifications to the Street System

Localized traffic impact will occur at several locations where local streets will be altered to accommodate the Regional Rail project's alignment within the corridor. These street modifications are in addition to the recommended closures of at-grade crossings. None of the modifications will cause adverse impacts to traffic once Regional Rail project construction is complete. Traffic will be inconvenienced only during the construction period. The TTA or its contractors will develop and implement a traffic management plan for each change to minimize this inconvenience and to maintain access to all properties.

Station Traffic Impacts

Localized increases in traffic volumes will occur at stations with parking facilities for passengers arriving by auto. In 2008, 15 intersections at eight stations will operate at an undesirable LOS E or F with the LPA. Two more intersections will operate at an undesirable level of service at the NE Regional Center Station and one more at the Durant Road Station. The TTA will implement mitigation measures to ease the impact at 12 of the 15 intersections affected with the LPA and one of the intersections affected at the NE Regional Center Station. These intersection improvements will include signal modifications and additional turning lanes.

The mitigation measures identified will provide the additional intersection capacity needed to serve Regional Rail station traffic. At seven of the mitigated intersections (six with the LPA and the one additional intersection at the NE Regional Center Station), a level of service E or F will occur even with the planned mitigation. The levels of service at these seven intersections reflect much larger problems associated with area traffic growth in general, or the common practice of allowing the level of service of local streets carrying low traffic volumes to drop to F at unsignalized intersections with thoroughfares.

Improvements are not planned at three intersections affected by the LPA, one intersection affected by the NE Regional Center Station, and one intersection affected by the Durant Road Station. At these five intersections, the level of service problem is solely associated with traffic growth in general, and extensive road improvements are needed. Such improvements are considered an area-wide problem that is beyond the responsibility of any single development.

During final design, the TTA will conduct the additional traffic studies required by municipal code and the NCDOT. The required studies and the development and implementation of final mitigation will be coordinated with local municipalities and the NCDOT under the TTA's planned mitigation stakeholder involvement program.

Impacts on Neighborhood Streets

Localized increases in traffic volumes also could occur on neighborhood streets near stations. Such impacts will occur from traffic that might choose to divert to local streets from congested thoroughfares to reach stations. Four stations, included in all three termini options, were identified with a potential to result in this type of impact: Alston Avenue/NCCU, Downtown Cary, State Fairgrounds, and Downtown Raleigh.

S.5.3 Compatibility with Bike Routes and Greenways

Every Regional Rail station will have provisions for bicycles. Bicycle racks (or other appropriate bicycle storage facilities) will be provided so that bicyclists can secure their bicycles at stations while using the Regional Rail project. The TTA intends to develop a policy allowing bicyclists to bring their bicycles on the train. The TTA already provides buses that have on-board bicycle racks. Some other area transit systems also provide bicycle racks on buses. There likely will be one car in each trainset that will allow bicycles on-board. These measures will provide bicyclists with additional mobility around the region. Accommodating bicycles also will provide the Triangle Region's travelers with an additional way to move around the Triangle without driving an automobile.

The only bikeway or major pedestrian way that could be negatively affected by Regional Rail (for all termini options) would be a proposed greenway trail by the Town of Cary. The town has proposed a "rail with trail" in its *Parks, Greenways & Bikeways Master Plan* that would share the railroad right-of-way from the west side of Cary and connect with the Raleigh Rail project. The Regional Rail project would use the same side of the railroad right-of-way as the proposed greenway and would likely preclude the construction of a greenway trail.

S.5.4 Parking Impact

Regional Rail is expected to increase the number of transit trips throughout the region. The increase in transit trips would result in fewer auto trips being made to employment centers near the Regional Rail stations. This, in turn, will reduce parking demand compared with the No-Build Alternative. Therefore, the Regional Rail project should reduce the number of new parking spaces required at major destinations such as downtown Durham, RTP, downtown Raleigh, and the State Government Center in Raleigh.

The construction of the Regional Rail project will use both on-street and off-street parking. On-street parking spaces, off-street parking spaces, and (in some instances) entire parking lots will be displaced along the alignment. The TTA will replace needed parking lost. During property acquisition, the TTA will work with all property and business owners that will lose parking because of the Regional Rail project to finalize an appropriate mitigation strategy. Construction of the Regional Rail project will result in the loss of 851 spaces with the LPA and the other two termini options. Seventy-four percent (631) of the 851 spaces taken by the LPA are in the railroad right-of-way.

Spillover parking impact in station areas occurs when the demand for parking exceeds the parking supply. The parking provided at the stations generally is adequate to meet forecast 2025 parking demand and to avoid potential spillover parking. There are exceptions at five stations:

- Downtown Durham;
- NW Cary;
- State Fairgrounds;
- Highwoods; and
- New Hope Church (LPA only).

The planned parking at these five stations, however, will be adequate to serve Regional Rail customers in 2008 and for several years after the project opens. Opportunities exist to expand parking later. Thus, spillover parking into surrounding neighborhoods is not expected at any Regional Rail station.

The construction staging plan for the project calls for the Regional Rail project to terminate at the Government Center Station between 2007 to 2011. The Downtown Raleigh station will provide “end-of-the-line” park-and-ride spaces during this time interval. The parking planned for the Downtown Raleigh Station will be adequate during the station’s brief service as an “end-of-the-line” park-and-ride lot.

S.5.5 Impact to Freight and Amtrak Service

The Regional Rail project will involve three relocations of existing track (3.2 miles total) with all termini options because of right-of-way constraints, existing overhead bridge locations, and avoidance of potential environmental impact.

Both freight and passenger train operations within the NCR, NS, and CSX corridors will be affected during construction of the Regional Rail project. The impact will include:

- Restrictions on operations through the construction zone; and
- Short durations of track closure to allow for construction of connections back to existing tracks at the ends of the track relocations described in the previous section.

Such closures also could occur in association with several siding alterations. The only impact during operation of the Regional Rail service will be associated with the provision of railroad service to the Duke Coal Spur.

S.5.6 Compatibility with Transportation Plans

The Regional Rail project is consistent with the long-range transportation plans of both the Durham-Chapel Hill-Carrboro Metropolitan Planning Organization (DCHC MPO) and the

Capital Area Metropolitan Planning Organization (CAMPO). They both include the Phase I Regional Rail project. Regional Rail is included as an integral part of multimodal center plans of the cities of Durham and Raleigh.

One desire expressed by all railroad stakeholders was to avoid affecting the existing or future capacity of the freight railroad. The Regional Rail project will allow for a second main freight-passenger track for the entire length of the project.

S.5.7 Construction Impact

Construction of the transit stations and associated facilities likely would affect local roads and modify traffic patterns. Potential transportation and circulation impact from construction activity could result from temporary road narrowing or closings; this would cause traffic to detour around or slow down near a construction site. Slow-moving construction vehicles on the roadways near a construction site also would affect levels of service on the roadways. Maintenance of traffic and the sequence of construction would be planned and scheduled to minimize traffic delays.

S.6 Environmental Consequences

This section summarizes the anticipated community, environmental quality, cultural resources, and natural resource effects of the Regional Rail termini options. These impacts are described in detail in Chapter 5 of the FEIS. The No-Build Alternative would have no impact on the project area, except for the loss of the transportation benefits described in [Section S.5](#).

S.6.1 Population, Employment, and Land Use

The impact of the Regional Rail project on population and employment was evaluated from a transit service and transit accessibility perspective. The larger the potential population and employment base served by the project, the greater would be the potential benefit to the region. Population and employment served differ between the termini options. The No-Build Alternative would offer some additional on-street bus transit service to the corridor's population and employment centers; it would not provide access to the higher-speed, exclusive guideway service offered by Regional Rail.

The 2025 population and employment projections are based on forecasts developed by the Durham-Chapel Hill-Carrboro and the Capital Area MPOs in 1998.

Population

The LPA will offer service to a projected population of 6,600 people within 1/4 mile of the planned stations in the opening year, increasing to 8,200 in 2025. Within 1/2 mile of the stations, the LPA will serve a projected population of 32,900 people in the opening year, increasing to 38,500 in 2025. Adding an extension to NE Regional Center will increase the population area served by about 840 (2.5 percent) in the opening year and 3,500 (9 percent) by 2025 within 1/2 mile of the stations. Adding an extension to Durant Road would further increase the population area served by about 1,260 (3.7 percent) in the opening year and 4,100 (10 percent) by 2025 within 1/2 mile of the stations.

Employment

The LPA will offer service to approximately 31,600 projected employees within 1/4 mile of the stations in the opening year, increasing to 37,000 in 2025. Within 1/2 mile of the stations, the LPA will offer service to approximately 94,100 projected employees in the opening year, increasing to 109,900 in 2025. Adding an extension to NE Regional Center will increase the employment base by about 900 in the opening year and 2,400 in 2025 within 1/2 mile of the

stations. Extending the project to Durant Road will further increase the employment base served by an additional 500 in the opening year and an additional 800 by 2025 within 1/2 mile of the stations.

Regional Rail will provide employment benefits to the Triangle Region from its ongoing operations and maintenance activities. Assuming only the benefit of funds brought in from outside the region, the net annual employment benefit will be an additional projection of 132 new jobs associated with the LPA and the NE Regional Center terminus option. An extension to Durant Road would add 10 more jobs. Considering all funds associated with the operation and maintenance of the Regional Rail project, an economic benefit of 561 jobs will occur for the LPA. The NE Regional Center terminus option would add 10 more jobs. The Durant Road terminus option would add 19 more jobs beyond the number with a NE Regional Center terminus.

Land Use

All of the station sites and the yard-and-shop site are compatible with existing land use plans and future development plans.

The Regional Rail project will not affect farmland classified as prime or unique, or as statewide or locally important.

The Regional Rail project will require the purchase of private land for its stations and yard and shop. The use of this private land by the Regional Rail project will result in the loss of potential tax revenue for the four municipalities, the two counties, and the two special taxing districts. The total tax revenue lost annually with the LPA will be \$153,500. An extension to NE Regional Center would increase annual lost tax revenue by \$12,800. A further extension to Durant Road would increase the lost tax revenue by an additional \$5,100. Therefore, depending on the terminus option, the Regional Rail project would result in a negligible net loss for all of the taxing jurisdictions of approximately 0.025 percent.

S.6.2 Neighborhoods and Community Services

The LPA will displace four households, 35 businesses, and seven institutional structures. An extension to NE Regional Center would not increase the number of displacements; however, an extension to Durant Road would displace an additional nine businesses. In general, suitable replacement housing is available and most businesses have indicated that they would relocate. The TTA will provide a relocation assistance program to households and businesses displaced. Additional businesses will be affected by construction or operation of the Regional Rail, including several that have encroached upon the railroad right-of-way in areas where that right-of-way will be used for the Regional Rail project. No dwellings, businesses, or institutions would be displaced by the No-Build or TSM alternatives.

Since the existing railroad corridor has been in operation for several decades, area neighborhoods and communities have developed taking into account the presence of the corridor. Implementation of Regional Rail within the same corridor will not create a new barrier to social interaction, community functioning, or general access to community services. Transportation benefits to communities and neighborhoods will result from access to stations and provision of feeder bus service to stations. The No-Build and TSM alternatives will have no impact on neighborhoods.

Experiences in other cities with rail transit systems would be considered when determining the security measures to be integrated into Regional Rail station design and transit operations. Several potential station areas currently have higher incidents of crime than others and could require additional security.

During the preparation of the FEIS, the TTA implemented a mitigation coordination program with key stakeholders, including area municipalities, universities, water resource regulatory

agencies, the State Fairgrounds, Wake County, the North Carolina Department of Cultural Resources, and the North Carolina Department of Administration. Under this program, these government bodies and agencies were involved in finalizing features of the LPA and in developing the mitigation programs described by impact type throughout the FEIS. The TTA will continue this stakeholder mitigation program during final design. The TTA will expand the effort to include affected property owners, the North Carolina Department of Transportation, and other stakeholders. Final details on community impact mitigation will be developed during this ongoing program.

S.6.3 Environmental Justice

This section describes potential impacts to minority and low-income communities. Presidential Executive Order 12898 requires that the potential for Regional Rail to create disproportionately high and adverse impacts on minority and low-income populations with respect to human health and the environment be evaluated.

Minority, specified in the order, is defined as Black/African-American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleut, and other non-white persons. A minority population exists if the percentage of minorities in the affected area is greater than 50 percent or “meaningfully greater” than the minority population percentage in the general area. This document uses the 50 percent threshold. “Low-income” can be defined using the Department of Health and Human Services poverty guidelines or the Department of Housing and Urban Development (HUD) definition of very low-income. This document uses the latter and expands the analysis to include HUD’s definition of “low-income” as well as “very low-income.”

The TTA has planned a transit network system that will provide transit service equity throughout the planned Regional Rail service area. In selecting station locations, consideration was given to those areas that are transit-dependent and low-income. Introduction of a new transit service will provide a new transportation option for citizens to access employment, schools, and other facilities. Not all minority and low-income communities that requested service will be provided rail service and a rail station; however, bus transit connections from these communities to the nearest rail station are included in the Regional Rail service plan.

Several low-income and/or minority communities would be affected by the Regional Rail project. Many of these communities are adjacent to the existing railroad corridor. This proximity would expose homes and businesses that abut the railroad corridor to potential impacts. The primary potential impacts would be related to:

- Increased noise levels;
- Displacement of homes and businesses; and
- Visual changes.

Throughout the development of the DEIS, the TTA held meetings with minority and low-income communities and/or their representatives. Generally, attendees were supportive of Regional Rail and saw the project as providing a needed impetus to investment in their neighborhoods. Individuals and some neighborhoods expressed concern about specific elements of the project during preparation of the DEIS and at the DEIS public hearings. These issues were addressed during the development of the LPA and associated mitigation.

In general, the Regional Rail project will not result in disproportionately adverse impacts on low-income and minority communities and businesses. As with any major transportation project, it is likely that residents within the project area will endure some impact because of the construction and operation of the Regional Rail project. This impact will not be disproportionately high and adverse for residents of the area. Among the positive effects of the project for these residents are:

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- Enhanced mobility options;
 - Greater access to regional jobs and non-job opportunities such as educational, shopping and entertainment activities; and
 - Potential economic development in communities along the project corridor.

S.6.4 Visual and Aesthetic Resources

Regional Rail will affect visual quality only at selected station locations and trackwork areas, not along the entire project. This impact will result from removal of, or reduction in, existing vegetative screens on the existing railroad corridor, new trackwork, and construction of station or parking lot infrastructure adjacent to residential areas or historic resources. Regional Rail passengers will have views into backyards, normally private spaces, at some locations. Four classifications of potential visual impacts were identified, ranging from no impacts to minimal, moderate, or substantial. “Substantial” indicates major changes in the existing visual character or viewshed of the resource.

Introduction of the Regional Rail project will create a substantial impact for a residential area on Ellis Road in Durham at the yard and shop. Additional substantive impacts will occur from Regional Rail at five locations:

1. Carrousel Park subdivision in Cary (but an existing vegetative buffer mostly will be maintained);
2. Turner/Neil Street area in southwest Raleigh;
3. Stanhope community in southwest Raleigh;
4. Pilot Mill and Halifax Park area in the Central District in Raleigh; and
5. Mordecai neighborhood in the Central District in Raleigh.

Four of these locations are where noise barriers ranging from 8.5 to 14 feet are planned to reduce noise to acceptable levels. Their large size could be considered too imposing for a residential neighborhood. They will provide the added benefit of blocking views of the railroad right-of-way and views by Regional Rail passengers of backyards. A 10-foot-high retaining wall will be at the fifth location.

Moderate impacts will occur at 19 locations. Changes will include:

- Loss of vegetation exposing the tracks to view or partial view;
- Loss of intervening buildings, replacement of commercial buildings with a parking lot;
- Introduction of aerial structures into the views of or from historic resources; and
- Blocking views of two National Register-eligible bridges with new bridges.

These impacts will be distributed throughout the corridor, with the greatest concentration between the Town of Morrisville and downtown Raleigh.

Application of context sensitive design principles will be used during final design to mitigate the moderate and substantial visual and aesthetic impacts of the Regional Rail corridor. This effort will include the provision of new landscaping at all these locations. Context sensitive design will provide for better integration of the project’s infrastructure into the community with compatible

materials, station area design guidelines, soft and hard landscaping, signing and lighting, and public art.

S.6.5 Air Quality

Air quality effects were examined from a regional or mesoscale perspective as well as from a project level and more localized perspective. The impact of a park-and-ride lot under a worst-case scenario also was considered. National Ambient Air Quality Standards for carbon monoxide will not be exceeded. Regional Rail will result in lower regional motor vehicle pollutant emissions than either the No-Build or TSM alternatives.

S.6.6 Noise and Vibration

Potential noise and vibration effects include noise from train operations, noise from rail yards, noise from increased auto and bus traffic near stations, and ground vibration generated by wheels rolling on rails. The No-Build and TSM alternatives would not result in noise or vibration impacts.

Noise impact can result from the train moving along the track (wheel-rail noise) or from the sounding of the train horn. The FTA criteria identify the acceptable difference between existing noise levels and transit-vehicle noise levels at homes and other noise sensitive land uses.

Wheel-rail noise impact will occur at 275 noise sensitive receptors (homes and churches) with the LPA, as well as the additional 20 receptors affected by the extension to the NE Regional Center and the eight receptors affected by the extension to Durant Road. Noise barriers will be cost-effective and used to fully mitigate wheel-rail noise impacts at all but two of these receptors. Sound insulation will be used to reduce interior noise levels at the remaining two receptors. The potential exists that the final specification for the Regional Rail vehicle will require a noise level lower than that assumed in the wheel-rail noise impact assessment. If this is the case, the wheel-rail noise impact assessment will be revisited during final design and barrier height and other mitigation requirements will be refined.

Wheel squeal impacts could potentially occur at two sites. If vehicle manufacturers' test data show the need for wheel squeal mitigation, a 3.5-foot noise barrier will be used to mitigate the impact.

To mitigate train horn impacts, the TTA will pursue, in association with area municipalities, the designation of quiet zones. Quiet zones will eliminate horn use and noise except in emergencies. If quiet zones prove infeasible, the Regional Rail project will use wayside horns to reduce the area affected by horn noise. Sound insulation will be used to reduce interior noise levels at 26 noise sensitive receptors that would be adversely affected by wayside horn noise.

Traffic noise increases near stations will be substantial at only one of the eight station areas with nearby noise sensitive uses. Sound insulation of affected homes will be used to mitigate the impact. The noise levels from rail yard and shop activities will generally satisfy the daytime noise criteria at most of the residential sites near the yard and shop site. The TTA will ensure that noise producing activities at the yard and shop will be limited to daytime hours to the extent possible. Nighttime activities, other than trains moving in the rail -yard, will be performed inside a closed building, which is the normal practice in maintenance yards. Ground-vibration impacts will not occur at the nearest sites monitored near the Regional Rail.

S.6.7 Historic and Archaeological Resources

In consultation with the State Historic Preservation Office (SHPO), it has been determined that 10 historic properties in the "Area of Potential Effect" (APE) of the Regional Rail project will be adversely affected under Section 106. A Memorandum of Agreement (MOA) has been entered into by the SHPO and the FTA (with TTA concurrence) that contains all measures agreed upon to

minimize or mitigate adverse effects to the National Register of Historic Places (NRHP) eligible or listed resources in the APE of the LPA (Duke Medical Center to Spring Forest). The MOA also includes stipulations for the implementation of a plan for archaeological work in the next project phase. The MOA was developed using input from the SHPO and the Section 106 Interested and Consulting Parties. The resources affected will be:

1. American Tobacco Manufacturing Plant;
2. Southern Railway Bridge;
3. Seaboard Railroad Bridge;
4. NC State Fairgrounds Commercial and Education Building;
5. J.S. Dorton Arena at the NC State Fairgrounds;
6. West Raleigh Historic District;
7. NCSU Campus Historic District;
8. Raleigh Hosiery Mill;
9. Raleigh Cotton Mill; and
10. Mordecai Place Historic District.

The archaeological survey for the Regional Rail Project identified 13 NRHP eligible (or potentially eligible) archaeological sites along the Regional Rail project. An additional site in the Regional Rail project, the Pinelands Cemetery (31DH677**), is not NRHP-eligible but is protected by North Carolina State statutes. The study identified 11 locations within the Regional Rail project where archaeological sites may be buried beneath fill deposits, parking lots, or standing structures. More intensive investigations, including mechanized subsurface testing, will be conducted at those locations prior to Regional Rail project construction in those areas. The MOA also includes stipulations for the implementation of a plan for archaeological work in the next project phase.

The No-Build Alternative would have no effect on either historic or archaeological resources.

S.6.8 Public Parks and Recreation Areas

Three parks would be affected by the project:

1. At Ruritan Municipal Park in downtown Morrisville, informal parking occurs on an undeveloped gravel area east of the park fence. This area is within the railroad right-of-way. Reclaiming this right-of-way for the Regional Rail project would eliminate the availability of this area for parking.
2. The State Fairgrounds Station will eliminate 190 spaces of informal parking used by the fairgrounds visitors within the railroad right-of-way. Although the fairgrounds would lose parking, visitors would gain access to rail transit, thus reducing the demand for parking. Fairgrounds officials have agreed to the loss of parking spaces and to allow Regional Rail patrons using the State Fairgrounds Station to use the fairgrounds parking lot north of Hillsborough Street. This parking would be unavailable to the TTA during the annual State Fair. During final design, the TTA will continue to coordinate planning efforts with fairgrounds officials.

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3. A ball field at Pullen Park is partially within the railroad right-of-way, but the project would avoid it through the use of a retaining wall. The City of Raleigh and Pullen Park officials are satisfied with the use of the retaining wall.

None of the three parks or parks facilities affected was funded with US Department of Agriculture Land and Water Conservation Funds, known as Section 6(f) funds. The No-Build Alternative would have no impact on parklands.

S.6.9 Ecological Resources

Ecological resources identified include wetlands, streams, protected species, and plant communities. Consultation with representatives of the resource agencies during scoping solicited comments on key issues of concern. Two rounds of meetings were held prior to the release of the DEIS. Participating resource agencies included the US Army Corps of Engineers (COE), the US Fish and Wildlife Service (USFWS), the NC Division of Water Quality (DWQ), the NC Wildlife Resources Commission (NCWRC), and the NC Natural Heritage Program (NHP). Not every agency was able to attend every meeting. Thus, multiple meetings were held during each round.

Upon completion of the wetland and stream delineations after release of the DEIS, field meetings were conducted with the DWQ and the COE. The focus of the DWQ meeting was primarily on the potential impact at locations subject to Neuse River Riparian Buffer Rules. Three meetings were held in the field with the COE to verify the boundaries of jurisdictional (streams and wetlands) areas. A joint meeting was held with the DWQ and the COE to discuss mitigation options that will compensate for unavoidable impacts to wetlands and streams incurred during construction of the Regional Rail project.

The four general plant communities within the Regional Rail project's construction limits are dominated by the urban-disturbed community. Of the approximately 424 acres that will be within the construction limits of the project between Duke Medical Center in Durham and Durant Road in Raleigh, more than 77 percent is urban-disturbed. Impacts to the pine community and the pine-hardwood community will be 31 acres and 38 acres, respectively, with the LPA. The extension to NE Regional Center would add 7 and 1 acres, respectively, to that impact. The extensions to Durant Road would add an additional 5 and 2 acres, respectively. Four acres of the hardwood community will be affected with the LPA and the extension to NE Regional Center. The extension to Durant Road would add five acres. No special or unique habitats are in the project area. There are few wildlife corridors within the construction limits of the Regional Rail project.

The Regional Rail project is within the Cape Fear and Neuse River drainage basins. The LPA and NE Regional Center terminus option will cross 19 perennial streams, affecting 4,069 linear feet of perennial stream classified as important and 108 linear feet of perennial stream classified as unimportant. The Durant Road terminus option will cross six additional perennial streams, affecting an additional 130 linear feet of perennial stream classified as important and no additional linear feet of perennial stream classified as unimportant. The LPA and NE Regional Center terminus option will cross 19 intermittent streams, affecting 717 linear feet of intermittent stream classified as important and 1,146 linear feet of intermittent stream classified as unimportant. The Durant Road terminus will cross two additional intermittent streams affecting an additional 61 linear feet of intermittent stream classified as important and no additional intermittent stream classified as unimportant. The existing railroad tracks already cross most of these streams. The TTA will pay into the Wetlands Restoration Program (WRP) to mitigate all water resource impacts, with the possible exception of those associated with the relocation of Stirrup Iron Creek. If the on-site mitigation of Stirrup Iron Creek is found to be feasible, the TTA will construct an on-site mitigation project.

Both the LPA and the extension to NE Regional Center will affect 1.21 acres of wetlands. The extension from NE Regional Center to Durant Road will affect an additional 0.04 acre of wetland. The TTA also will pay into the WRP to mitigate the wetland impacts of the Regional Rail project.

A COE dredge and fill permit will be required under Title 33, Part 323 of the *Code of Federal Regulations* for discharges of dredged or fill material into waters of the United States. The permit will be needed for both the wetland and stream impacts. An Individual Permit will be required for the entire project because of the amount of impact. The Clean Water Act provides for public notice and review of permit applications as well as review by the US Fish and Wildlife Service, and approval by the US Environmental Protection Agency. Additionally, a US Environmental Protection Agency National Pollutant Discharge Elimination System permit for stormwater discharge will be required under Title 40, Part 122 of the *Code of Federal Regulations*. A Water Quality Certification pursuant to Section 401 of the Clean Water Act will be needed from the DWQ. This permit is required in association with the COE dredge and fill permitting process. COE authorization cannot be granted without DWQ certification.

Based upon a review of the Federal Emergency Management Agency (FEMA) maps, up to eight 100-year floodplains are near the existing trackwork in the rail corridor. The LPA and an eastern terminus at NE Regional Center will affect seven floodplains. Extending the project to Durant Road will affect one more floodplain. Seven of the eight floodplains will be affected by Regional Rail because they are in the existing railroad right-of-way. A Letter of Map Revision (LOMR) will be needed in five cases. The Regional Rail project will not result in any substantial adverse impact on natural and beneficial values of the floodplains. In addition, it will not:

- Result in a substantial change in flood risks or damage; and
- Have substantial potential for interruption or termination of emergency service and evacuation routes.

No federally-listed protected species were identified in the project corridor, although potential habitat for two of the federally-listed protected species (smooth coneflower and Michaux's sumac) was identified within approximately 19 percent of the construction limits. The potential habitat areas were surveyed for the presence of smooth coneflower and Michaux's sumac during the appropriate survey windows. The surveys found that a biological conclusion of no effect was warranted for the Regional Rail corridor.

The No-Build and TSM alternatives would not affect ecological resources.

S.6.10 Hazardous Materials/Potential Contaminants

The FTA requires assurance that no grant funding will be used for activities associated with clean-up of contamination. Hazardous material and underground storage tank features were identified using records review, map review, limited interviews with NC Division of Waste Management (NCDWM) personnel, and a two-part field investigation. The features identified include known sites of environmental contamination, known generators of hazardous materials, known locations of hazardous materials or petroleum products storage, and potential undocumented sources of environmental contamination.

Forty sites with known or potential environmental contamination were identified in the project area by the records review and field investigations. Nine of the known sites can be categorized as low-risk. "Low-risk" is used to describe sites that have little potential to affect the project adversely. Sites are classified as low-risk because of

- Their respective locations in relation to the railroad or station site; or
- The direction of groundwater flow in the area.

Low risk sites have a groundwater flow direction that appears to be away from the railroad or station site, or have been identified as low risk by an expanded records review, consultation with

the property owners or their consultants, consultation with regulatory personnel or, in one case, an Environmental Site Assessment (ESA).

Several other sites would require additional investigation prior to project right-of-way acquisition and construction to confirm and update information obtained from agency files and the public record. Select sampling of the soil and groundwater would be conducted at each site to help determine the absence or presence of contamination. If contamination is found, soil and groundwater investigations would be expanded to determine the extent of contamination. A preferred method of testing would be determined on a site-by-site basis closer to the time of right-of-way acquisition.

S.6.11 Energy Use

The implementation of the Regional Rail project would result in a net decrease in regional transportation system energy requirements for propulsion (both rubber tire and rail) ranging from a 0.25 percent reduction to 0.76 percent. The change reflects the sum of energy savings from less motor vehicle use in the region plus the energy expended by greater bus use, rail use, and building the Regional Rail project.

S.6.12 Construction Impacts

The No-Build Alternative would involve no new construction beyond the projects included in area transportation plans; therefore, it would cause no construction impacts. Regional Rail construction impacts will last only until construction is completed. The TTA has developed a Project Management Plan in conformance with the FTA requirements for new transit projects. This living document will incorporate construction specifications that reflect local requirements, as well as those imposed by the CSX, NS, NCDOT, and North Carolina Railroad. Construction procedures to help minimize construction impacts will be included in the Project Management Plan and included in project specifications and contractor terms.

Potential construction impact concerns to be addressed in these construction procedures will include:

- Dust and equipment operation emissions;
- Noise;
- Storm water management and erosion control;
- Waste disposal; and
- Tree protection.

Plans for stormwater management and sedimentation and erosion control will be developed in accordance with requirements of the NC Department of Environment and Natural Resources, Divisions of Water Quality and Land Resources.

Since a majority of the construction will occur within the railroad right-of-way and train traffic will continue, construction and safety requirements of the CSX, NS, NCDOT, and North Carolina Railroad will govern construction progression.

Both the Triangle (Raleigh-Durham-Chapel Hill) Region and State of North Carolina will benefit from Regional Rail because of the new employment and associated earnings that will not have occurred otherwise within the region and state. With the LPA, the region will experience approximately 6,100 new jobs and approximately \$150 million in associated earnings during construction. With the extension to NE Regional Center, the figures would increase by approximately 100 additional jobs and \$4 million more in associated earnings. With the extension

to Durant Road, the figures could increase by approximately 300 additional jobs and \$7 million more in associated earnings. The State of North Carolina will experience a similar range of benefits.

Regional Rail construction will result in some inconveniences. These inconveniences potentially can disturb residents, businesses, and business customers. Construction-related effects of the project on air quality will be limited to short-term increased fugitive dust and mobile source emissions during construction. Dust controls will be integrated into the TTA's Project Management Plan and the project's contract specifications. Traffic control plans also will be implemented to minimize the disruption to traffic.

The construction will cause short-term noise and vibration effects. Effects on community noise and vibration levels during construction include:

- Noise and vibration from construction equipment; and
- Noise from construction and delivery vehicles traveling to and from the site.

Construction noise is regulated by local ordinances and by US Environmental Protection Agency emission standards for construction equipment. Noise controls will be incorporated into the design considerations, the TTA's Project Management Plan, contract specifications, and construction planning.

Adverse impacts on water quality during construction will be mitigated through a variety of best construction and stormwater management practices. Structures and debris will be removed in accordance with local and state regulatory agencies permitting the project. Trees outside the construction limits will be protected from construction activities.

Utilities in the railroad right-of-way and paralleling the existing tracks to be relocated with the LPA include: approximately 700 feet of sanitary sewer, almost 5,000 feet of water line, almost 14,000 feet of power line, over 8,000 feet of telephone line, and 72,650 feet of fiber optic line. An extension to NE Regional Center would increase the length of relocated fiber optic line by approximately 2,200 feet. An extension to Durant Road would increase the length of relocated fiber optic line by an additional 2,200 feet. The TTA will coordinate construction activities with the appropriate utility representatives to minimize service disruptions.

The TTA will notify the National Geodetic Survey representatives so that they can relocate any affected control monuments.

S.6.13 Secondary and Cumulative Impact

Regional Rail could encourage development or redevelopment at many of its station locations. Such development is an objective of the project and is compatible with comprehensive plans adopted by the cities or towns of Durham, Cary, Morrisville, and Raleigh. Such development can generate additional community, cultural resource, and environmental impact.

The potential for secondary development near Regional Rail station sites include:

- Comprehensive plans, small area plans, and zoning ordinances of the cities and towns that will host Regional Rail stations permit and encourage higher-density, compact, and transit-oriented development around the station sites.
- Development is occurring around the station sites that support the effectiveness of Regional Rail. The City of Durham and the NE Regional Center area in North Raleigh actively encourage transit-oriented development at such locations through incentive programs.

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- Combined with the comprehensive plan policies, zoning ordinance regulations, and incentive programs encouraging transit-oriented development, Regional Rail likely will be a catalyst to support development and redevelopment around many of the planned stations.

Secondary impact includes impacts caused by the potential secondary development described above. Impact issues associated with secondary development from Regional Rail are: traffic and transportation, community, environmental justice, air quality, historic resources, and ecological resources. Secondary impact findings are:

- These station areas have the potential for secondary development but the respective surrounding street networks do not currently have the capacity to absorb that development:
 - Ninth Street;
 - Downtown Durham;
 - Triangle Metro Center;
 - Downtown Cary;
 - West Raleigh;
 - State Fairgrounds;
 - New Hope Church Road;
 - Spring Forest;
 - NE Regional Center; and
 - Durant Road.
- Potential secondary development could affect communities that are concerned with incompatible development. The TTA will work with area municipalities and redevelopment project proponents to integrate redevelopment proposals into the existing urban fabric.
- The TTA met with representatives of minority and low-income communities. Generally, attendees saw Regional Rail as providing a needed impetus to investment in their neighborhoods. Some individuals and neighborhoods did express concern with specific project elements.
- It is unlikely that the combination of Regional Rail and development or redevelopment encouraged by the presence of Regional Rail will affect local air quality.
- Many of these development and redevelopment projects included in plans for municipalities along the corridor could adaptively re-use existing buildings, helping to preserve the historic character of the downtown areas. New development also could adversely affect historic resources in the absence of local controls.
- The secondary impacts to ecological resources associated with the Regional Rail project should be minimal.

Cumulative actions associated with the Regional Rail corridor are:

- Regional Rail.
- Development that has occurred in the past along the corridor and associated infrastructure.

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- Development that is expected to continue in the project area. Regional Rail would influence the character of that development.
 - The NCDOT proposal to improve the railroad tracks in the corridor. Based on NCDOT plans and programs, the following improvements are reasonably foreseeable:
 - A sealed corridor;
 - Communications improvements;
 - Curve improvements from Charlotte to Raleigh to allow increased train speeds;
 - The addition of a second railroad track and operation of high-speed passenger trains in the corridor; and
 - The potential to move Amtrak, including potential high-speed trains, onto the CSX track north of downtown Raleigh from its current route east of downtown Raleigh.
 - Proposals by the cities of Durham and Raleigh to build intermodal or multimodal transportation centers in their respective downtowns.

Impact issues associated with cumulative impacts are the same as those associated with secondary impacts plus noise and impacts to park and recreation areas. Potential impacts of the additional projects listed above in combination with Regional Rail include:

- Increased safety at grade crossings;
- Increased need for highway/railroad grade separations at five locations;
- An improved local, regional, and multistate transportation system that is a viable alternative to the automobile;
- Impacts in the “wye” area in downtown Raleigh associated with connecting Regional Rail and Amtrak services at the proposed Raleigh Intermodal center;
- Increased parking losses between the Downtown Raleigh and Government Center Stations associated with providing for both Regional Rail tracks and an additional freight/passenger rail track;
- Increased noise impact when high-speed passenger trains are added to Regional Rail noise; and
- Increased impact on historic resources, parks, and natural resources from freight/passenger track improvements.

The nature of the resources affected and the extent of the impact, however, are such that it is not expected that the cumulative impacts of Regional Rail, secondary development, and other rail improvements would be collectively more significant than the impact of each individual action. With sound local land use planning and appropriate mitigation of direct impacts, the cumulative impacts of Regional Rail, secondary development, and other improvements in the railroad corridor should enhance the overall quality of life for residents of the Triangle Region.

S.7 Financial Analysis

The financial analysis (described in detail in Chapter 6 of the FEIS) focused on the resource requirements, funding strategies, and financing strategies available to:

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- Operate and maintain TTA regional bus services; and
 - Construct, operate, and maintain a Regional Rail service.

The financial analysis determined a set of strategies for Regional Rail that would provide funding to support the construction, operation, and maintenance of the alternatives. The financial analysis assumed substantial federal participation in the construction of the project. The financial analysis did not consider costs, resources, and funding strategies associated with bus service provided by entities other than TTA. The financial analysis assumed that the local and state funding sources that currently support these bus operations would cover additional capital and operating costs associated with these expanded services.

S.7.1 Financial Planning Process and Structure

The objective of the financial analysis was to project annual expenses and revenues, both capital and operating, over a 24-year period from 2002 to 2025 to determine if there would be sufficient financial capacity to build and operate the Regional Rail project. Four major project components served as the basis for the description of the alternatives used in the analysis and their costs and revenues:

- Annual costs for the transit facilities construction program;
- Bus and rail car fleets;
- Operating costs; and
- Operating revenues.

A sources and uses of funds analysis (see [Section S.7.2](#)) was undertaken for each alternative. Each year-end balance was reviewed to determine in what years capital or operating fund shortfalls were predicted. For the purposes of the financial analysis, the following responses to capital cost shortfalls were considered:

- Increase in the annual amount of capital funding for the project using additional funding sources;
- Debt financing; and
- Delays in service growth and/or construction.

The following responses to operating and maintenance shortfalls were considered:

- Delays in service growth;
- Increase in the amount of non-fare box funding; and
- Increased fare assumptions.

The financial analysis took these potential remedies into account until no further capital and operating shortfalls remained. A series of financial feasibility tests were then examined to ensure that the financial plan for each alternative was feasible and acceptable to the capital markets (if debt financing is applied). These tests were minimum debt service coverage and maintenance of sufficient year-end balances.

S.7.2 Sources and Uses of Funds Analysis

Rail construction costs included expenses such as planning, design, construction, management, oversight, and project start-up costs. Throughout the analysis year-of-expenditure, costs were estimated using inflation projections obtained from Economy.com, current through August 2002. The financial analysis also addressed the costs to rehabilitate, replace, and maintain capital assets to keep them in a state of good repair. In addition to the capital costs associated with the Regional Rail project, there would be costs for regional bus service under the No-Build and TSM alternatives.

Bus and rail operating costs were based on operating plans prepared for each alternative and termini option. Regional Rail operating costs were projected using a cost allocation model that distinguishes between fixed costs (which are assumed unrelated to service levels) and variable costs directly associated with the principal rail transit cost drivers: route-miles, number of stations, peak rail cars, revenue car-miles, and train-hours. Bus operating costs were projected using a cost allocation model that associated costs with the principal transit cost drivers: peak vehicles, revenue-hours, and revenue-miles.

The ranges of funding sources assumed in the financial analysis were:

- Federal Transit Administration grants, including: Section 5307 Urbanized Area Formula, Section 5309 New Starts, Section 5309 Rail Modernization, and Section 5309 Bus Related;
- Local funds, including the NCDOT and TTA regional taxes; and
- Transit-related revenues, including passenger revenues, advertising revenues, employer subsidies, and interest on carryover funds.

The financial analysis revealed that the projected revenue sources would not be sufficient to cover project costs (capital, operation, and maintenance costs) on a pay-as-you-go (cash) basis for most alternatives. Only the No-Build Alternative and the TSM Alternative could be financed on a pay-as-you-go basis.

Therefore, the financial analysis considered conventional and innovative debt-financing techniques recently and currently applied by US transit agencies to advance major transit investments to implementation. In addition, the analysis considered financing approaches advocated by the Federal Transit Administration and under consideration by other transit agencies at a stage in the New Starts planning process similar to the Regional Rail project. The financial analysis considered the following forms of debt financing: rail line lease/leaseback, tax-exempt commercial paper (TECP), conventional bonds, cross-border lease, and full-funding grant agreement bonds (FFGA).

Any of the alternatives could be built and operated by the TTA throughout the 24-year analysis period. The primary difference between the alternatives is the extent to which debt would be required. The total long-term debt (including conventional bonds, FFGA bonds, and rail car leases) will be \$202 million for the LPA (assuming New Starts funds are uncapped). Adding the NE Regional Center Station would increase the debt by \$6 million (for a total of \$208 million). Adding the Durant Road Station would increase the debt by \$14 million (for a total of \$222 million). These numbers would be higher if one assumes that New Starts fund availability for the Regional Rail project is capped at \$55 million per year. In this case, the long-term debt for the LPA will be \$336 million. Adding NE Regional Center Station would increase the debt by \$6 million (for a total of \$342 million). Adding the Durant Road Station would increase the debt by \$14 million (for a total of \$356 million).

S.7.3 Risks and Uncertainties

Although the financial analysis defined a most likely scenario based on certain funding, financing, and cost assumptions, there are several operating and capital risks that can influence the final financial results:

- Operating risk, including changes in fares, fare policy, and cost recovery and changes in operating costs;
- Construction cost risk, including unforeseen construction costs and changes in the inflation rate; and
- Financing risk, including variations in dedicated revenues, the availability of capital funds from various sources, and variations in interest rates.

A risk analysis was conducted to assess potential impacts of these risk factors on Regional Rail financial results. The risk analysis findings provide a degree of confidence that the TTA could commit itself to an initial program of rail construction within its existing financial resources. The addition of service beyond the initial operating segment (Ninth Street to Government Center) could require additional tax revenues, delays in construction, some combination of the two, and/or other actions to increase debt service coverage ratios. In subsequent years as the TTA approaches the time to commit funds toward future projects, additional risk analyses would be undertaken with more current economic projections.

S.8 Evaluation

This section first presents the reasons for selecting the LPA of the Regional Rail project (Duke Medical Center to Spring Forest) and the two additional eastern terminus options at NE Regional Center and Durant Road. It then presents the results of an evaluation conducted for the LPA of the Regional Rail project and the associated termini options. Where applicable, the Regional Rail project is compared with the No-Build and the TSM alternatives. More detail is presented in Chapter 7 of the FEIS.

S.8.1 Reasons for Selecting the Locally Preferred Alternative and the Two Eastern Terminus Options for Evaluation in the FEIS

Trackwork Alignment, Location, and Configuration

The Regional Rail project is a two-track alignment for the entire corridor from Duke Medical Center to Durant Road. There is an exception at Boylan Junction in downtown Raleigh, where a short length of single track will be built to avoid construction disturbance or relocation of existing railroad tracks between Hargett Street and Jones Street. Two tracks offer the greatest flexibility in providing Regional Rail service and allow for the selected 10-minute peak period headways. Funding limitations led to the decision to build initially (for operation beginning in FY 2008) the portion from Ninth Street in Durham to Government Center in Raleigh as a single-track project with passing sidings. The second track will be added by 2015.

A center-to-center distance of 26 feet will be maintained between the Regional Rail tracks and the adjacent freight railroad tracks for the entire length of the corridor. This track distance was requested by the railroads along the existing right-of-way so that maintenance activities on one line will not disturb operations on the other.

To meet existing and future freight and intercity passenger needs, the LPA will maintain existing freight/intercity passenger capacity. Curve realignments at certain locations are included in the LPA to allow for future intercity passenger track improvements that would permit trains to operate at higher speeds in North Raleigh and West Raleigh, and between Cary and Durham.

Rail Service Frequency

The Regional Rail project will initially operate at 15-minute peak period headways and 30-minute off-peak headways. When track improvements are made to the initial operating segment, train frequency will increase in 2015. Peak-period headways will increase to 10 minutes and off-peak headways will increase to 20 minutes. This phasing-in of service frequency is planned with the expectation that ridership will begin at lower levels and grow over time. Thus, the higher frequencies will not be needed initially.

Termini

The LPA termini will be the Duke Medical Center and Spring Forest Stations. The FEIS also evaluates eastern termini options at the NE Regional Center and the Durant Road Stations in Raleigh. The two additional stations were evaluated in the FEIS because the TTA felt that this portion of the project should be as long as possible, but was uncertain of the affordability of the additional two stations. The extension to NE Regional Center and Durant Road is considered a Phase II extension to the 16 station Phase I system.

Station Sites

The LPA will have 16 stations. Two additional eastern termini stations are evaluated in the FEIS. The locations and names of the stations are shown in [Figure S-1](#). Selection of the station sites was based on several factors including:

- Public and agency support;
- Proximity to population, commercial, service (such as municipal and state government facilities), and employment centers;
- Environmental, cultural, and similar issues;
- Minimal disruption;
- Parking and vehicular circulation;
- Existing and future pedestrian access;
- Compatibility with existing and planned transit supportive land uses;
- Costs; and
- Existing surface road access.

At four station locations (Duke Medical Center, Alston Avenue/NCCU, Morrisville, and Spring Forest), DEIS comments or changes in the project setting resulted in the evaluation of additional sites between the DEIS review period and the FEIS. The Morrisville Station was replaced by the NW Cary Station. DEIS comments, changes in the project setting, and new ridership forecasts resulted in changes in the conceptual designs evaluated.

Yard and Shop Sites

The Ellis Road yard and shop site was selected as part of the LPA because it is vacant and has the least environmental constraints.

Grade Separations

Morrisville Parkway, New Hope Church Road, and Millbrook Road will be grade-separated from both the freight and Regional Rail tracks with the Regional Rail project. The DEIS found that the New Hope Church Road and Millbrook Road grade crossings would operate at an undesirable level of service (F) in 2025. The greatest near-term need for a grade separation exists at these two crossings. The Morrisville Parkway grade separation was identified as a future need in the DEIS. The crossing was found to operate at an undesirable level of service (E) in 2025 with the introduction of Regional Rail trains.

Vehicles

Diesel multiple unit (DMU) technology was selected for the LPA. While serving fewer riders than a light rail vehicle, a DMU costs substantially less to construct and operate. The lower-volume rail service and the widely spaced stations of the Regional Rail system lend themselves best to DMU passenger vehicles, a technology used extensively throughout Europe, particularly in Germany and Great Britain, as well as in Canada, but not in the United States.

S.8.2 Evaluation of the LPA and the Two Eastern Terminus Options

The purpose of the evaluation is to bring together the key findings, both qualitative and quantitative, so that the benefits and costs can be evaluated against the stated goals and objectives for the Regional Rail project, including the LPA and the two additional eastern terminus options. The intent of this analysis is to measure the Regional Rail project against these decision-making criteria: effectiveness (goals achievement), efficiency (cost-effectiveness), financial feasibility, equity, and trade-offs.

These criteria — as well as public, agency, and other stakeholder comments on the findings of the DEIS — influenced six decisions that led to the selection of the LPA (Duke Medical Center to Spring Forest). These decisions were the decision to build the Regional Rail project and the decisions related to alignment, rail service frequency, termini, station sites, and the yard and shop site. These same criteria applied to the LPA and the two additional eastern terminus options yield the following conclusions:

- **Effectiveness.** Regional Rail with any of the three eastern termini under consideration will be effective at providing high-quality and time-competitive regional transit service. The Regional Rail project also will introduce transit service operating via separated right-of-way that will provide a faster and substantially more reliable transit service. The Regional Rail project will provide in almost every case shorter travel times than either the No-Build or TSM alternatives.

Regional rail will be effective at supporting efforts in the Triangle Region to promote more compact forms of development. In combination with local government land use policies supporting compact development, Regional Rail will likely act as a catalyst to support more compact forms of development and redevelopment around stations.

Regional Rail also will be effective at increasing the quantity and usage of transit service in congested regional travel corridors, with a longer project extending the benefits to more people.

- **Efficiency (Cost-Effectiveness).** The LPA and both eastern terminus options would have a cost-effectiveness index of between \$13.00 and \$14.00.
- **Financial Feasibility.** The Regional Rail project is financially feasible using a variety of conventional and innovative debt financing techniques including: conventional revenue bonds, rail line lease/leaseback, cross-border leases, tax-exempt commercial paper (TECP),

and full-funding grant agreement (FFGA) bonds. To fully finance a project longer than the LPA the vehicle registration tax rate that helps fund the TTA would need to be increased.

- Equity. Regional Rail with any of the three eastern termini options will provide equitable service to population groups and employment opportunities. The Regional Rail project will not result in inequitable environmental impact on low-income and minority communities.
- Trade-Offs. In general, environmental impacts of all types are scattered along the full length of the Regional Rail right-of-way. There are no concentrations of any particular type of impact that would cause one to select a shorter Regional Rail project to avoid the impact. Therefore, project termini impacts generally were not a factor in the decision to build a longer or shorter Regional Rail project. The termini beyond Spring Forest Road are listed as Phase II projects in the Regional Rail System Plan. There are two other projects in Phase II, a transit improvement to Raleigh-Durham International Airport and a transit improvement to Chapel Hill.

A project from Duke Medical Center to Spring Forest was selected as the LPA because it is the longest option that can be built without increased local tax revenue. In addition, this decision reserves the setting of priorities for the first Phase II component to be built.

S.9 Comments, Consultation, and Coordination

Draft and Final Environmental Impact Statements (DEIS and FEIS) that address the full range of alternatives and issues important to the selection of a LPA and the development of mitigation measures can be accomplished only in consultation with all those who have a stake in that decision. An ongoing community and stakeholder participation and coordination program was conducted during the preparation of the DEIS and during the development of the FEIS. Community and stakeholder involvement will continue following publication of the FEIS and throughout final design and construction. The community and stakeholder involvement program included the following components, which are described in detail in Chapter 8 of the FEIS:

- Scoping. A public and regulatory agency program occurred at the beginning of the DEIS preparation process to help identify the issues and alternatives to be addressed in the DEIS.
- Community and Stakeholder Involvement Program. Meetings with project stakeholders — individuals and organizations who have a stake in the Regional Rail project — were conducted throughout the DEIS and FEIS process. The meetings were intended to provide the foundation for moving towards consensus on project details, including impact mitigation, and building support for Regional Rail. The Community and Stakeholder Involvement Program included management and technical team meetings, individual and organizational stakeholder meetings, meetings with elected officials and Metropolitan Planning Organization Technical Coordinating Committees, regional public meetings, and other meetings. As part of the public review of the DEIS, public open houses and formal public hearings were held.
- Agency and Institution Coordination. The TTA also met with numerous agencies and institutions to discuss issues important to them. The agencies and institutions included state and federal environmental resource agencies, metropolitan planning organizations, cities, towns, counties, councils of government, and transit providers.
- Railroads Coordination. The TTA met regularly with representatives of the Norfolk Southern, the CSX, the North Carolina Railroad, and the Rail Division of the NCDOT to discuss design and operation requirements for sharing the proposed right-of-way with both existing and future passenger and freight service.

S.10 Section 4(f) Evaluation

Section 4(f) was enacted as part of the US Department of Transportation (DOT) Act of 1966. Section 4(f) was originally set forth in Title 49, United States Code (USC), Section 1653(f), and applies only to agencies within the DOT. In January 1983 as part of an overall recodification of the DOT Act, Section 4(f) was amended and codified in 49 USC, Section 303. This section reads, in part:

- (c) The Secretary may approve a transportation program or project requiring the use of publicly owned land of a public parks, recreation areas, or wildlife and waterfowl refuges, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, recreation area, refuge, or site) only if-
- (1) there is no prudent and feasible alternative to using that land; and
 - (2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.

When a project uses land protected by Section 4(f), a Section 4(f) Evaluation must be prepared. Five Section 4(f) resources within the project corridor are used by the Regional Rail project. They require evaluation in accordance with Section 4(f). These resources are:

- North Carolina State Fairgrounds;
- North Carolina State University Campus Historic District;
- Central Raleigh Historic District;
- The Raleigh Cotton Mill; and
- Neuse River Railroad Station (extension to Durant Road only).

The TTA has coordinated the impact analyses for historic resources with the North Carolina State Historic Preservation Office and the Advisory Council on Historic Preservation, as well as several historic resource consulting parties. The TTA also coordinated with representatives of the State Fairgrounds.

The supporting information presented in the Section 4(f) Evaluation in Chapter 9 of the FEIS demonstrates that there are unique problems or unusual factors involved in the use of alternatives that avoid these properties. The avoidance alternatives fail to meet the project purpose and need, fail to meet the objectives of those responsible for the resource used, or result in impacts of extraordinary magnitude to the environment or the community. The documentation presented in the Section 4(f) Evaluation of the FEIS demonstrates that:

- The LPA is a feasible and prudent alternative with the least harm to Section 4(f) resources;
- There are no feasible or prudent alternatives to the Section 4(f) use of the above resources; and
- The LPA includes all possible planning to minimize harm to the resources resulting from such use.

S.11 Issues to be Resolved

Most issues related to the Regional Rail project were resolved between the DEIS and the FEIS.

In September 2002, the TTA had reached agreement for use of railroad right-of-way with the North Carolina Railroad (Durham to downtown Raleigh), and was close to agreement on purchasing right-of-way from the CSX (north Raleigh). The agreements address track spacing, grade crossing control, grade separation, provisions for existing and future freight customers, provisions for a future second freight track and high-speed rail-related track improvements, liability, train controls, track maintenance, and other issues associated with sharing of the railroad right-of-way.

Extensive coordination efforts have taken place between the TTA and the NCDOT regarding the Regional Rail Project and NCDOT/High Speed Rail sharing rail corridors in the Raleigh-Durham area. These coordination efforts will continue. All needed agreements will be completed prior to the start of final design.

A mitigation program is included in the FEIS in chapters 4 and 5. The impacts are summarized in [Sections S.5](#) and [S.6](#). Planned mitigation is presented by issue after each description of impact. Development of this program included coordination with:

- Local, state, and federal agencies;
- Individuals;
- Associations, and
- Other stakeholders with an interest in the program.

Additional details will be developed with these same stakeholders during final design.

The TTA will continue to coordinate with area municipalities and developers as development and redevelopment plans in station areas advance. The TTA will continue to participate in the efforts of the cities of Durham and Raleigh to develop multimodal transportation centers.