

21.0 EVALUATION OF ALTERNATIVES

This chapter evaluates how the proposed LYNX Blue Line Extension Northeast Corridor Light Rail Project (LYNX BLE) would meet the Purpose and Need (Chapter 1.0) and evaluates the effectiveness of the alternatives under consideration. The information in this chapter is derived from the other chapters of this Draft Environmental Impact Statement (EIS) and provides the basis for decision-makers and the public to assess the benefits, costs and environmental consequences against the goals of the proposed project. Equity considerations and trade-offs are also presented.

21.1 Project Goals and Effectiveness

The goals established for the LYNX BLE were based on the principles developed for the Northeast Corridor Major Investment Study (MIS). The principles stem from the transit goals established for the *Centers and Corridors Concept Plan* (1994) and the *2025 Integrated Transit/Land Use Plan* (1998). Objectives from the updated *Centers, Corridors and Wedges Growth Framework*, Draft 2010, were also considered. The goals and objectives of the proposed project are as follows:

Goal 1 – Land use: Support the region’s Centers, Corridors and Wedges vision

Objectives:

- Provide transit improvements that are consistent with land use plans and policies
- Provide transit improvements that are compatible with existing or desired community character, as well as neighborhood preservation
- Provide transit connections to transit-supportive areas
- Support existing and planned land use patterns
- Promote transit-supportive development within station areas
- Provide a strong link to integrating land use and transportation
- Promote growth in an area that can support new development and away from areas that cannot support new development

Goal 2 – Mobility: Improve access and mobility in the corridor and throughout the region; Increase transit ridership; Improve quality of transportation service

Objectives:

- Offer people a choice in meeting mobility needs
- Reduce dependence on congested roadways
- Increase transit ridership
- Increase transit mode share
- Provide travel time savings
- Provide service for transit-dependent populations
- Provide connections to activity centers, special event venues, and cultural sites
- Improve convenience and reliability of transit service

Goal 3 – Environment: Preserve and protect the environment

Objectives:

- Minimize disruptions to communities
- Minimize negative effects on natural resources
- Minimize negative effects on cultural resources
- Support air quality improvements
- Support sustainable growth in the region

Goal 4 – Financial: Develop affordable, cost-effective transportation solutions

Objectives:

- Ensure capital and operating and maintenance costs are consistent with funding levels
- Minimize operating and maintenance costs
- Optimize cost-effectiveness

Goal 5 – System Integration: Develop transportation improvements that function as part of the larger transportation system

Objectives:

- Develop improvements that provide through-service and connections to other corridors
- Ensure operating efficiency
- Balance use of system capacity

The effectiveness of the proposed project is the extent to which an alternative accomplishes the purposes that the proposed project is intended to address. The following sections evaluate the effectiveness of each of the five goals established for the proposed project.

21.1.1 Effectiveness of Goal 1: Support the region’s Centers, Corridors and Wedges vision

The No-Build Alternative would not support the region’s Centers, Corridors and Wedges vision, as the Northeast Corridor would not implement a fixed guideway transit option that would allow the corridor to effectively combine transit and land use plans. Under the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option, the proposed LYNX BLE project would support the *Centers, Corridors and Wedges Growth Framework*, Draft 2010, for the Charlotte-Mecklenburg region (see Chapter 4.0: Land Use, Public Policy and Zoning). As envisioned in these plans, future development would be focused into areas that can support new development, or are in need of redevelopment, and away from areas that cannot support new growth. The highest intensity of development would be encouraged around transit stations. By focusing future growth in corridors with multiple travel alternatives, the region would be able to grow in a manner that promotes continued access and mobility and that enhances the quality of life for residents and employees. Both the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would support that vision.

To determine the LYNX BLE’s effectiveness in supporting the above land use goals, population and employment densities were evaluated. The total population within the Northeast Corridor is approximately 89,360 persons and is projected to increase 41 percent by 2030. The Center City itself is projected to experience a population increase of 208 percent persons between 2008 and 2030. The total employment within the Northeast Corridor is approximately 79,736 jobs and is estimated to grow by 60 percent to 127,317 by 2030. The largest employment area in the corridor (outside of Center City Charlotte) is the University City area, which includes University Research Park, University Place and the University of North Carolina at Charlotte (UNC Charlotte). Employment within Center City Charlotte is 68,630 jobs and is projected to increase 62 percent to 111,069 jobs by 2030.

Under the No-Build Alternative, existing and future populations and employment within the corridor would continue to be served by the bus system, with some expansion of bus service in the future. As such, population growth and employment growth within the corridor may not be concentrated for effective service by transit. Under the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option, these populations and employment centers would be better focused to station areas, thereby allowing a more effective use of transit and land use plans.

Neighborhood preservation is an important component of the Centers, Corridors and Wedges vision that should also be supported. While the No-Build Alternative would be compatible with existing community character, it would not be effective in encouraging certain desired elements of community character such as revitalization and connectivity. The Light Rail Alternative and Light Rail Alternative – Sugar Creek

Design Option, however, would be effective in encouraging such character. For example, the proposed Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would alter existing land uses at proposed station locations. Station Area Plans would be formally adopted and implemented. In addition, a Northeast Corridor Infrastructure (NECI) program is under development and would consist of multi-modal improvements (e.g. intersection enhancements, improved connectivity, streetscape improvements, sidewalks, and bicycle routes) to enhance access to neighborhoods and business and to promote transit-oriented development in the station areas.

The Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would introduce new elements into the proposed project corridor. These new elements include: the light rail vehicles and trackway; station platforms and park-and-ride lots; the overhead catenary system; electrical substations, signal houses, and crossing cases; and, bridges and retaining walls. To minimize the potential visual and physical effects of the proposed light rail project, the City of Charlotte and the Charlotte Area Transit System (CATS) have employed three key techniques aimed at providing a well designed project that fits into the context of its surrounding environment. These include: the development of station area plans; incorporation of the *Urban Design Framework* into the proposed project's design criteria; and, the Art in Transit Program. With these techniques, the proposed project would provide improvements that are compatible with existing or desired community character. As the majority of the proposed Light Rail Alternative or Light Rail Alternative – Sugar Creek Design Option would be constructed within existing transportation corridors (rail and roadway), neighborhood preservation goals would be attained.

21.1.2 Effectiveness of Goal 2: Improve access and mobility in the corridor and throughout the region; increase transit ridership; improve quality of transportation service

Improve access and mobility

Under the No-Build Alternative, improvements to access and mobility would be limited to additional bus service within the Northeast Corridor as the No-Build Alternative includes improvements to service frequency for six routes. Under the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option, 13 transit stations with connections to bus service and park-and-ride options would be created. The proposed Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would improve mobility in areas with the highest levels of employment in the Charlotte metropolitan area, including Center City Charlotte and the University City area (as described in Section 21.1.1). The Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would also improve access to transit by providing station facilities, more frequent and reliable service, pedestrian and bicycle improvements, and parking facilities. In addition, the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would provide a seamless and direct connection to destinations along the existing LYNX Blue Line light rail service.

Since the Northeast Corridor is comprised of a large number of residents that are transit-dependent, access to travel is a major concern for area households. Ten percent of the housing units in the corridor have no vehicles available to travel to and from work or for any other purpose. The Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would also improve mobility and access in areas with large numbers of residents who are transit-dependent.

Increase transit ridership

The Northeast Corridor, which has few arterials and minimal cross-town connections, has several major roadways and intersections currently experiencing peak hour volumes that exceed capacity. Approximately 23 percent of the existing intersections along the project operate at congested levels of service. Much of the growth in the Charlotte-Mecklenburg region in the 1980s and 1990s occurred quickly in a dispersed pattern of jobs and residences with limited connectivity between uses. These land use patterns have resulted in people driving more and making longer trips, leading to traffic volumes that exceed roadway capacity and result in unacceptable levels of service in many locations throughout the region. Projections show that high growth rates will continue, further burdening the regional transportation system. The regional model indicates that the region is expected to experience a projected 57 percent increase in regional person trips, a 59 percent increase in daily Vehicle Miles Traveled (VMT), and a 70 percent increase in daily Vehicle Hours Traveled (VHT) from 2008 to 2030. Continued population and

employment growth are expected to increase travel demand, resulting in deteriorating conditions on area roadways, despite planned roadway widening and intersection improvements. Traffic volumes are expected to increase on nearly all area roadways, especially at the outer end of North Tryon Street/US-29, where volumes are expected to roughly double by 2030.

The Northeast Corridor is a major employment, shopping and educational destination from all across the region, anchored by Center City Charlotte at the southern end and University City at the northern end. As such, the Northeast Corridor is a major generator of trips from throughout the region, as well as a significant number of intra-corridor trips. Based on adopted land use policies, the travel market between corridors will strengthen. Connections between the Center City campus and the main campus of UNC Charlotte will be important. In addition, special events and tourism are another travel market in the corridor.

The Light Rail Alternative would operate in a dedicated right-of-way, free from traffic congestion; therefore it is projected that the Light Rail Alternative would provide a significant travel time savings over the No-Build Alternative. For this reason, total transit trips would be greater for the Light Rail Alternative than for the No-Build Alternative, and dependency on highly congested roadways would be reduced. The Light Rail Alternative would also increase transit ridership. Compared to the No-Build Alternative, approximately 18,300 additional riders would utilize transit under the Light Rail Alternative. Ridership on the light rail system is projected to increase from 23,700 daily riders on the existing LYNX Blue Line under the No-Build Alternative, to a total of 47,500 daily light rail boardings for the entire alignment (South to Northeast) under the Light Rail Alternative; this represents an addition of 23,800 riders per day on the light rail system alone. It is expected that transit times and trips under the Light Rail Alternative – Sugar Creek Design Option would be comparable to the Light Rail Alternative.

Improve quality of transportation service

As noted, the Light Rail Alternative has the advantage of providing faster service over the No-Build Alternative. For example, when comparing peak hour travel times from UNC Charlotte to Center City Charlotte, the Light Rail Alternative would take just over 25 minutes for in-vehicle travel times, whereas under the No-Build Alternative, the in-vehicle travel time using bus service would take nearly 58 minutes. Comparable travel by automobile would take nearly 36 minutes to travel from UNC Charlotte to Center City Charlotte.

The proposed project would improve the quality of transportation service by providing a frequent and reliable service in the Northeast Corridor. Congestion on arterial roadways and highways influence the reliability of travel by automobile and bus. Light rail traveling in dedicated right-of-way would not be subject to congested roadway conditions, resulting in dependable and on-time service. The proposed project would travel between major growth and employment centers with six-minute to ten-minute headways during peak periods.

An analysis of over 55 intersections was conducted to determine the effects of the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option on traffic operations within the corridor. The analysis generally shows minor increases in automobile delay with the Light Rail Alternative, compared to the No-Build Alternative. Additional signalized intersections, turn lanes, and grade separations were included in the project design to address potential traffic impacts.

Table 21-1 provides a comparison of mobility improvements for the alternatives.

**Table 21-1
Comparison of Mobility Improvements**

	No-Build Alternative	Light Rail Alternative ¹
Total Daily Light Rail Boardings	23,700	47,500
Total Daily Transit Ridership	83,041	101,302
Annual Trips to Special Markets (Stadium, Arena, Convention Center, UNC Charlotte)	n/a	1,212,068
Transit System User Benefits (annual hours of travel time savings) ²	n/a	2,891,383 - 3,820,570 ²
Service Reliability	Low	High

¹ No Difference between Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option

² Range is based on the Light Rail Alternative compared to the TSM Alternative modeled as a Premium Mode (similar to rail) versus the TSM Alternative as a Non-Premium Mode (bus).

Source: CATS LYNX BLE, Northeast Corridor, FY11 New Starts Submittal Mobility and Cost-Effectiveness Template; AECOM, Metrolina User Benefit Summary, FY11 New Starts forecasts

21.1.3 Effectiveness of Goal 3: Preserve and protect the environment

During the Draft EIS, a range of environmental impacts were analyzed with the intent to preserve the natural and cultural richness of the project area. The impacts that were assessed included the effects of the No-Build, Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option on natural and human resources, including: land use, socio-economics, visual and aesthetic character, historical and archeological resources, air quality, noise and vibration, energy, utilities, hazardous and contaminated materials, protected species, wetlands and surface waters, parklands, and neighborhoods, community services, environmental justice populations. Chapters 3.0 through 19.0 provide a thorough discussion of the probable impacts of the No-Build, Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option. Table ES-1 in the Executive Summary provides a summary of the environmental impacts.

The No-Build Alternative would result in fewer impacts to natural resources. However, the No-Build would result in increased daily VMT (approximately 141,259 more than under the Light Rail Alternative), increased auto emissions, and thus could impact regional air quality conformity. The No-Build Alternative would result in greater impacts to socio-economic conditions in that it would not create as many jobs or encourage investment along the corridor.

Under the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option, land use and transportation plans would be implemented. Impacts to natural resources would be limited primarily to wetland and stream impacts, noise and visual impacts, and visual and aesthetic impacts. However, mitigation measures are expected to minimize these impacts. Additionally, it is anticipated that the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would result in a decrease in VMTs, thereby reducing auto emissions, which are known to have a negative impact on air quality.

21.1.4 Effectiveness of Goal 4: Develop affordable, cost-effective transportation solutions

Affordability is measured by the financial feasibility of an alternative, which is the extent to which sufficient funding is available or can be developed, to support construction, operation and maintenance. The financial capacity of the proposed project rests on the demonstrated strength of the voter-approved ½-percent sales and use tax, the City of Charlotte’s AAA investment bond rating, and CATS Financial Policies, which require an annual year-end \$100 million unobligated fund balance. The estimated capital cost of the proposed Light Rail Alternative is \$948.6 million (2009 dollars). The Light Rail Alternative – Sugar Creek Design Option would cost an additional estimated \$57.9 million (2009 dollars). CATS’ system-wide operations and maintenance costs are expected to be approximately \$112.7 million annually for the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option, compared to \$95.7 million for the No-Build Alternative. A review of operating and capital revenues and expenses reveals a positive balance for the No-Build, Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option (Chapter 20.0: Financial Analysis). CATS has the fiscal capacity to build either the Light Rail Alternative or Light Rail Alternative – Sugar Creek Design Option in the Northeast Corridor and operate

the existing bus and light rail services with an ending balance in 2030 of approximately \$165 million for the Light Rail Alternative and \$143 million for the Light Rail Alternative – Sugar Creek Design Option. The state and local funding sources to accomplish this program are already committed in the form of the CATS sales and use tax and creation of the State Transit Trust Fund. Therefore, it is anticipated that the proposed project could be built within project budget and could be operated and maintained with available revenue.

Cost-effectiveness is the extent to which an alternative provides a level of benefit that is commensurate with its costs (and relative to other alternatives). The cost-effectiveness index is used to determine the advantages of the proposed project, and is determined by a formula in the Federal Transit Administration’s (FTA) New Starts Criteria (*Technical Guidance on Section 5309 New Starts Criteria*, 1997). The formula inputs difference in annualized capital and operating costs between the Light Rail Alternative and the Baseline/TSM Alternative divided by the annualized user benefits (travel time savings) for the Light Rail Alternative compared to the Baseline/TSM Alternative, i.e., the annualized cost per hour of travel time savings. The cost effectiveness value for the Light Rail Alternative is \$16.59, meaning that is the average cost per new rider. The Light Rail Alternative – Sugar Creek Design Option was not evaluated for cost effectiveness since the Metropolitan Transit Commission (MTC) adopted the proposed Light Rail Alternative as the preferred route for the proposed project on April 22, 2009; however, as capital costs are \$57,980,000 more for the design option, it would be less cost effective.

**Table 21-2
Comparison of Costs and Cost-Effectiveness**

	No-Build Alternative	Light Rail Alternative	Light Rail Alternative – Sugar Creek Design Option
Estimated Capital Cost, (millions of dollars, 2009)	\$0.0	\$948.6	\$1,006.5
Annual O&M Costs (millions of dollars, 2009)	\$95.7	\$112.7	\$112.7
Cost-Effectiveness ¹	n/a	\$16.59 – \$21.22 ²	n/a
Operating Cost per Passenger Mile	n/a	\$0.70	\$0.70

¹ Incremental annualized cost in forecast year divided by annualized user benefits (FTA New Starts Criteria)

² Range is based on the Light Rail Alternative compared to the Baseline/TSM Alternative modeled as a Premium Mode (similar to rail) vs. a Non-Premium Mode (bus). FY11 New Starts Report cost-effectiveness was \$16.01-\$20.45. The table reflects the revised 15% cost estimate with the VLMF cost.

Source: CATS LYNX BLE Cost-Effectiveness Templates, 2010.

21.1.5 Effectiveness of Goal 5: System Integration

As previously described, the region’s Center, Corridors and Wedges vision is vital to the success of combining transit and land use plans within the Northeast Corridor. Part of that vision is development of improvements within each of the five targeted corridors that facilitates through service and connections among the corridors. The planned improvements are outlined in the *2030 Transit Corridor System Plan* (2006). As the No-Build Alternative would not support the region’s Centers, Corridors and Wedges vision, this alternative would not fulfill Goal 5. The Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option, however, would as those alternatives focus growth in corridors with multiple travel alternatives that promotes continued access and mobility within the system.

21.2 Equity

Equity is the extent to which each alternative provides fair distribution of benefits, costs and impacts across various subgroups in the corridor. The benefits to land use, access and mobility, and environment would be realized by residents within the proposed corridor, while some potential impacts would occur to those same residents. The Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would improve access and mobility within the proposed project corridor, thereby improving access to employment centers, educational facilities and cultural/recreational/entertainment facilities. It is not anticipated that any one group would receive a disproportionate benefit, or lack of benefit, of these uses. Furthermore, it is not expected that any one group would receive a disproportionate share of the financial burden of the proposed project. The proposed project would be funded by a combination of federal, state,

and local funds. Existing funding structures would continue to support other services and capital programs throughout the proposed project corridor and beyond.

Overall, the proposed LYNX BLE would improve accessibility for all communities of concern including low-income, minority and transit-dependent populations. While some impacts would occur within these communities, these impacts would be minimal compared with the proposed project's benefits to the larger environmental justice populations, including increased accessibility, a new mode choice, and reduced travel times to/from Center City Charlotte.

21.3 FTA New Starts Criteria and Project Status

The proposed project is following the FTA planning and project development process for projects that are considered new start fixed guideway or rail projects, called "New Starts." New Start projects, such as the proposed LYNX BLE, are those for which the local transit agency (i.e. CATS) is seeking discretionary federal funding from the Section 5309 New Starts Program. In accordance with federal transportation law, called the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU), FTA has developed and uses the *New Starts Criteria* to decide whether projects may advance into preliminary engineering or final design, and to evaluate and rate projects in support of funding recommendations.

A project that does not have an overall project rating of "Medium" or better cannot advance into the next phase of FTA's project development process. Projects must receive an overall rating of at least "Medium" to be eligible to receive Section 5309 funding. Each year FTA submits its *Annual Report on Funding Recommendations* to Congress as a companion document to the annual budget submitted by the President. The report provides recommendations for the allocation of New Starts funds under Section 5309 of Title 49 of the United States Code. As required by SAFETEA-LU, FTA uses the following project justification criteria to evaluate New Starts projects: mobility improvements; environmental benefits; cost effectiveness; operating efficiencies; transit-supportive land use policies, existing and future land use patterns, and economic development; and other factors. FTA must also consider the local financial commitment for the proposed project. In total, the criteria are intended to measure the overall merits of the project and the sponsor's ability to build and operate it. The most recent report, which is for fiscal year 2011, is located at the following webpage, with the LYNX BLE presented on page A-153: http://www.fta.dot.gov/publications/reports/reports_to_congress/publications_11092.html

FTA reviews the project justification and local financial commitment criteria for each candidate project and assigns a rating for each criterion. For some of the project justification criteria, the proposed project is compared against a New Starts "baseline alternative", in this case is the TSM Alternative. The New Starts baseline alternative consists of improvements to the transit system that are relatively low in cost and represent the "best that can be done" to improve transit without a major capital investment in new transit guideway infrastructure. As such, the New Starts baseline alternative is usually different from the No-Build Alternative which is the NEPA baseline against which environmental impacts are measured in this Draft EIS.

A candidate project is given an overall rating of "High", "Medium-High", "Medium", "Medium-Low" or "Low", based on ratings assigned by FTA to each of the project justification and local financial commitment criteria described above. These ratings are important, as FTA considers them in its decision to recommend projects for New Starts funding. Specifically, FTA will not recommend funding for projects which are rated "Medium-Low" or "Low." Moreover, Federal budget constraints mean that a "High", "Medium-High" or "Medium" rating does not automatically translate into a funding recommendation, although the potential for receiving New Starts funding is much greater with these ratings.

The New Starts evaluation of a project is an on-going process. FTA's evaluation and rating occurs annually in support of budget recommendations presented in the *Annual Report on Funding Recommendations* and intermittently when the project sponsor requests FTA approval to enter into preliminary engineering or final design. Consequently, as proposed New Starts projects proceed through the project development process, information concerning costs, benefits, and impacts is refined and the

ratings are updated to reflect new information. The following sections represent FTA’s most recent rating of the LYNX BLE, which results in an overall project rating of “Medium.” A summary of the ratings reported in the *Annual Report of Funding Recommendations, Fiscal Year 2011*, for the LYNX BLE is provided in Table 21-3. The proposed project was advanced into Preliminary Engineering based on this rating.

**Table 21-3
Summary of New Starts Criteria Ratings
LYNX BLE Northeast Corridor Light Rail Project**

Category	Rating
Project Justification	Medium
Mobility Improvements	Medium-High
Environmental benefits	High
Operating efficiencies	Medium
Cost Effectiveness	Medium
Transit-supportive (existing) land use	Low
Economic development	Medium-High
Local Financial Commitment	Medium
Section 5309 New Starts Share of Total Cost: 50 percent	Medium
Capital Finance Plan	Medium-High
Operating Finance Plan	Medium
Overall Project Rating	Medium

Source: *Annual Report of Funding Recommendations, Fiscal Year 2011, New Starts, Small Starts, and Paul S. Sarbanes Transit in Parks Program, 2010*

21.3.1 Project Justification: Medium

The project justification takes into account the following six factors:

Mobility Improvements: Medium-High

In its evaluation of the mobility improvements that would be realized by implementation of a proposed project, FTA evaluates four measures:

1. User Benefits per Passenger Mile on the Project
2. Number of Transit Dependents Using the Project
3. Transit Dependent User Benefits per Passenger Mile on the Project
4. Share of User Benefits Received by Transit Dependents Compared to Share of Transit Dependents in the Region

User benefits: This measure essentially represent all the travel time savings to transit riders in the forecast year that result from the New Starts project as compared to the New Starts baseline alternative. The benefits include reductions in walk times, wait times, transfers, and, most importantly, in-vehicle times. In order to rate projects in comparison to other proposed New Starts, this measure is normalized by the annual passenger miles traveled on the New Starts project in the forecast year. The result is a measure of the intensity of the user benefits.

Number of Transit Dependent Individuals Using the Project and Transit Dependent User Benefits per Passenger Mile on the Project: These two measures represent the number of transit dependents affected by the project and the intensity of the benefits to those transit dependent users. The first is self explanatory while the second is defined the same as the measure of user benefits per passenger mile described above but for transit dependent passengers.

Share of User Benefits Received by Transit Dependents Compared to Share of Transit Dependents in the Region: This measure represents the extent to which the project benefits transit dependents compared to their regional representation. For example, if 10 percent of the user benefits for the project accrued to transit dependents, but they represented 20 percent of the region’s population, the measure would be 0.5, indicating that the project did not benefit transit dependents compared to their share of the region’s population.

Environmental Benefits: High

In its evaluation of environmental benefits that would be realized through the implementation of a proposed project, FTA considers the current air quality designation of the project area by the U.S. Environmental Protection Agency (EPA). This measure is defined for each of the transportation-related pollutants (ozone, CO, and PM-10 and PM-2.5) as the current air quality designation by EPA for the metropolitan region in which the proposed project is located, indicating the severity of the metropolitan area's noncompliance with the health-based EPA standard (NAAQS) for the pollutant, or its compliance with that standard. FTA has found that the air quality information submitted to assess the environmental benefits does not significantly distinguish the competing New Starts projects. While FTA reports the information submitted by project sponsors on environmental benefits to Congress in the *Annual Report on Funding Recommendations*, it does not formally incorporate this measure in its evaluation of New Starts projects.

Operating Efficiencies: Medium

Based upon its prior experience in evaluating New Starts projects, FTA has previously determined that locally-generated and reported information in support of the operating efficiencies criterion does not distinguish in any meaningful way differences between competing major transit capital investments. FTA further believes that the anticipated operating efficiencies of proposed New Starts projects are adequately captured under its measure for evaluating project cost effectiveness.

Cost Effectiveness: Medium

Significant among the project justification criteria is cost effectiveness, which is the annualized capital and operating cost per hour of user benefits for the forecast year. It captures the additional costs of the New Start project compared to the transportation benefits to transit riders. User benefits are defined identical to the measure used in the mobility improvements criterion.

New Starts projects must be rated "Medium" for cost effectiveness, in addition to receiving an overall "Medium" rating, in order to be considered by the Federal Transit Administration for New Starts funding.

Transit-Supportive Land Use: Low

This criterion reflects the population and employment densities within 0.5 mile of each proposed station in the project.

Economic Development: Medium-High

This criterion addresses the extent that transit-oriented development is likely to occur in the New Start project's corridor. FTA explicitly considers the following transit supportive land use categories and factors:

1. Transit Supportive Plans and Policies, including the following factors:
 - Growth management;
 - Transit supportive corridor policies;
 - Supportive zoning regulations near transit stations; and
 - Tools to implement land use policies.
2. Performance and Impacts of Policies, including the following factors:
 - Performance of land use policies; and
 - Potential impact of transit project on regional land use.

21.3.2 Local Financial Commitment: Medium

Proposed New Starts projects must be supported by evidence of stable and dependable financial resources to construct, operate and maintain the existing and the new transit system. The measures FTA uses to evaluate local financial commitment are:

Local Share: Medium

FTA examines the proposed share of total project costs from sources other than Section 5309 New Starts, including Federal formula and flexible funds, the local match required by federal law, and any

additional capital funding. The share of the project cost covered from funding sources other than Section 5309 new Starts will be 50 percent.

Strength of Capital Financing Plan: Medium-High

FTA looks at the stability and reliability of the proposed capital financing plan, including the current capital condition of the project sponsor, the level of commitment of capital funds to the proposed project and to other projects, the financial capacity of the project sponsor to withstand cost overruns or funding shortfalls, and the reliability of the capital cost estimates and planning assumptions.

Strength of Operating Financing Plan: Medium

FTA looks at the ability of the sponsoring agency to fund operation and maintenance of the entire system (including existing service) as planned, once the guideway project is built. This includes: an examination of the current operating condition of the project sponsor; the level of commitment of operating funds for the transit system; the financial capacity of the project sponsor to operate and maintain all proposed, existing and planned transit services; and the reliability of the operating cost estimates and planning assumptions.

The fiscal year 2011 report to Congress shows the project cost and funding source amounts that FTA relied on in rating the project's local financial commitment. Chapter 20 of this DEIS shows the amounts now expected to be available from these sources at the time this DEIS was prepared. It is normal for financial plans to evolve at this stage of project development, but FTA will assess the financial plans again before deciding whether to approve the project into Final Design, the next stage of project development.

21.4 Summary and Significant Trade-Offs

The ability to satisfy the project goals is measured through the effectiveness, performance and efficiency of each of the alternatives. The desirability of an alternative is determined by the quantity and quality of a given product or service delivered to or consumed by users at minimum cost. In other words, the most attractive alternative would be the one in which the qualitative and quantitative benefits (e.g., increased mobility, increased ridership, etc.) outweigh the costs (e.g., environmental impacts, financial expenditures, etc.). This Draft EIS compares the No-Build Alternative to the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option and illustrates that the two Build Alternatives address the goals and objectives of the proposed project. The Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option would enhance accessibility, improve mobility, and support land use goals that would not be possible under the No-Build Alternative. The following summarizes the evaluation of the alternatives against the adopted goals and the assessment of impacts documented in this Draft EIS. Additionally, the trade-off between the benefits and costs of the proposed alternatives is discussed for each alternative. A summary of the proposed alternatives versus the goals of the proposed project is presented in Table 21-4.

Table 21-4
Summary of the Proposed Alternatives versus the Project Goals

Goal	No-Build Alternative	Light Rail Alternative	Light Rail Alternative – Sugar Creek Design Option
1: Land use	<ul style="list-style-type: none"> • Would not support the region’s Centers, Corridors and Wedges vision • Existing development trends would continue in areas that cannot support new development 	<ul style="list-style-type: none"> • Would support the region’s Centers, Corridors and Wedges vision • Would support existing and planned land use patterns • Would provide a link to integrate land use and transportation • Would promote growth in areas that can support new development 	Would fulfill the goals as equally as the Light Rail Alternative
2: Mobility	<ul style="list-style-type: none"> • Would provide limited improvements in mobility options • Would not improve quality of transportation service 	<ul style="list-style-type: none"> • Would provide mobility options that is time-competitive with travel by automobile • Would increase transit ridership • Would provide significant travel time savings • Would provide improved service levels for transit-dependent populations 	Would fulfill the goals as equally as the Light Rail Alternative
3: Environment	<ul style="list-style-type: none"> • Would not support desired changes in land use patterns • Would not impact natural resources • Higher emissions due to increased traffic would not support Air Quality improvements 	<ul style="list-style-type: none"> • Would support sustainable growth patterns • Would impact natural resources, but impacts would be minimized and/or mitigated • Would support Air Quality improvements due to reduced auto dependence • Use of existing railroad and roadway rights-of-way will minimize impacts to natural and built environment 	Would fulfill the goals as equally as the Light Rail Alternative, though would result in variations to natural resource impacts.
4: Financial	<ul style="list-style-type: none"> • Consistent with projected funding levels 	<ul style="list-style-type: none"> • Consistent with projected funding levels • Provides a Cost-Effectiveness alternative 	Would be consistent with projected funding, though would be more costly and less cost-effective.
5: System Integration	<ul style="list-style-type: none"> • Would not support through-service and would provide limited connections to other corridors 	<ul style="list-style-type: none"> • Would provide through service to existing light rail line and implement part of the 2030 Transit Corridor System Plan 	Would fulfill the goals as equally as the Light Rail Alternative

21.4.1 No-Build Alternative

The No-Build Alternative would not fulfill Goal 1 to support region’s Centers, Corridors and Wedges vision as no improvements would be made that are consistent with land use plans and policies. Likewise, the No-Build Alternative would not fulfill Goal 2 to improve access and mobility within the corridor and throughout the region. The No-Build Alternative would not encourage the use of transit. Travel time savings would not be realized and service improvements for transit-dependent populations would not be provided or would be limited. Similarly, Goal 5, which encourages system integration, would not be realized under the No-Build Alternative. The No-Build Alternative would not fulfill Goal 3 to preserve and protect the environment. Under the No-Build Alternative, population growth and land use would not be concentrated to the City’s centers and corridors, and urban sprawl could continue. This could result in continued impacts to natural resources as development trends could continue in outlying areas of the

metropolitan region. Additionally, an alternative to the automobile and bus would be not available, resulting in no improvements to air quality. The No-Build Alternative would fulfill Goal 4 by providing a cost effective alternative that ensures capital and O&M costs are consistent with funding levels.

21.4.2 Light Rail Alternative

The Light Rail Alternative would fulfill each of the project goals. Goal 1, to focus growth in the Northeast Corridor directing new development and redevelopment around transit stations, would be attained as the Station Area Plans would employ the City's Zoning Ordinance to implement land uses that are transit supportive. The Light Rail Alternative would also fulfill Goal 2, to improve access and mobility within the Northeast Corridor and the region. The Light Rail Alternative would increase transit ridership, improve transit travel times, and improve mobility for transit-dependent populations. The Light Rail Alternative would fulfill Goal 3, to protect the environment, by supporting sustainable growth through transit-supportive development plans. Increased transit use would reduce vehicle miles of travel by automobiles, thereby resulting in a reduction in automobile emissions. This reduction in automobile emissions would result in improvements to local air quality. However, the Light Rail Alternative would result in impacts to other natural resources such as wetlands and streams. These impacts would be minimized or mitigated as described in this Draft EIS. Goal 4, to develop affordable, cost-effective transportation solutions, can be attained under the Light Rail Alternative as projected capital and operating and maintenance costs are consistent with anticipated funding levels. However, though the Light Rail Alternative is only slightly higher to the No-Build Alternative in terms of system-wide annual operating and maintenance cost, the capital costs are significantly greater. Goal 5, which encourages system integration, would be realized under the Light Rail Alternative as it would provide through service to the existing light rail line, and implement part of the *2030 Transit Corridor System Plan*.

21.4.3 Light Rail Alternative – Sugar Creek Design Option

The Light Rail Alternative – Sugar Creek Design Option would fulfill each of the project goals in the same way as the Light Rail Alternative. However, capital costs associated with the Light Rail Alternative – Sugar Creek Design Option would be higher than under the Light Rail Alternative. Additionally, impacts to natural and human resources would differ slightly under the Light Rail Alternative – Sugar Creek Design Option as compared to the Light Rail Alternative.

In 2008, CATS conducted an alternatives analysis on the Light Rail Alternative – Sugar Creek Design Option, available under separate cover as the *Sugar Creek and North Carolina Railroad Alignment Alternatives Study* (February 2009), and presented the findings to the MTC. The MTC confirmed its preference for the Light Rail Alternative over the Light Rail Alternative – Sugar Creek Design Option due to lack of additional benefit to justify increased costs, largely associated with additional business and right-of-way impacts. The information from the aforementioned alternatives analysis and the additional detail on the potential environmental impacts detailed in this Draft EIS, coupled with the comparison of the results presented in this chapter, will further document the examination of the design option and allow public comments as input to the MTC's decision-making process.