




**LYNX Blue Line Extension  
(Northeast Corridor)  
Light Rail Project  
Contract #: 08-477  
WBS #: 6.03**

# ENVIRONMENTAL METHODOLOGY

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## **1.0 INTRODUCTION**

### **1.1 Overview**

This report is to provide the data collection and impact assessment methodology to be used in preparing the Draft and Final Environmental Impact Statements (EISs) for the proposed LYNX Blue Line Extension (LYNX BLE). The proposed project includes the evaluation of No-Build, Transportation Systems Management (TSM) and Light Rail Alternatives. The Light Rail Alternative would provide an extension of the Charlotte Area Transit Systems' (CATS) LYNX Blue Line, which opened for revenue service in November of 2007.

CATS is seeking federal funding through the Federal Transit Administration's (FTA) discretionary Section 5309 New Starts grant program (49 USC§5309). As such, the project would result in a federal action requiring the completion of an EIS in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. A Notice of Intent was published in the Federal Register on September 29, 2000. This project is grandfathered from the regulations of Section 6002 of the Safe Accountable Flexible Efficient Transportation Equity Act-A Legacy for Users (SAFETEA-LU); however, CATS will seek comments on this Draft Environmental Methodology report from other departments of the City of Charlotte, Mecklenburg County and the North Carolina Department of Transportation (NCDOT) in accordance with Section 6002 of SAFETEA-LU.

### **1.2 Project Description**

The LYNX BLE project is located within the City of Charlotte and Mecklenburg County, North Carolina. The proposed project would extend an existing light rail system by 10.9 miles and provide thirteen transit stations, including six walk-up stations and seven park-and-ride facilities. The proposed alignment would run in the CATS Northeast Corridor within the existing Norfolk Southern and North Carolina Railroad (NCR) rights-of-way from Center City Charlotte to the middle of the alignment, near Old Concord Road, where it would then transition to the median of North Tryon Street. The line would remain in the median until north of Harris Boulevard, where it would turn east and enter the University of North Carolina Charlotte (UNC Charlotte) campus before returning to North Tryon Street to a terminus just south of I-485. The proposed project would include bus services to connect the light rail service with the CATS regional bus system, as well as any ancillary facilities such as traction power substations and signal houses. The proposed project assumes that the existing CATS Light Rail Maintenance Facility would be used for this project. If additional maintenance facilities or storage yards are required, the scope of the EIS would be expanded to include such facilities.

The project is in the Preliminary Engineering/EIS (PE/EIS) phase of FTA Project Development. The PE/EIS phase involves the preparation of preliminary engineering design plans sufficient for the assessment of project costs, ridership and environmental benefits or consequences. A Draft and Final EIS will be prepared in accordance with the National Environmental Policy Act of 1969 and in accordance with FTA's Section 5309 New Start requirements. The Draft EIS will be prepared using preliminary engineering plans at an approximate 15 percent level of design.

Based on the review of the analysis presented in the Draft EIS and comments received, the Metropolitan Transit Commission (MTC) will select the NEPA Preferred Alternative to be documented in the Final EIS. If the Light Rail Alternative is chosen at the conclusion of the Draft EIS public and agency circulation period, the Final EIS will be prepared using an estimated 30 percent level of engineering design.

### **1.3 Purpose of the Report**

The purpose of the report is to document 1) the approach that will be used to establish the environmental baseline for which the potential impacts of a No-Build, a Transportation Systems Management and a Light Rail Alternative will be measured, and 2) the assessment methods to be used to identify the potential costs and benefits of each alternative. A planning horizon year of 2030 will be used.

This Environmental Methodology Report describes the approach that will be taken to identify the existing conditions, environmental consequences or impacts, mitigation measures and permits required to ensure compliance with federal, state and local regulations governing the preparation of an Environmental Impact Statement. The methods described in this report will document the techniques to be used to identify the potential social, economic and environmental impacts of the alternatives under study, including whether these impacts would be short or long-term in nature, or would result in any irreversible or irretrievable impacts to resources.

All methods presented will be in accordance with the NEPA, Council on Environmental Quality (CEQ) Guidance for preparing EISs and guidance from the Federal Transit Administration of the U.S. Department of Transportation. The methods described herein are identified based on regulations and technical guidance published prior to May 1, 2008.

This report will be reviewed by other departments of the City of Charlotte, Mecklenburg County and NCDOT for input on the proposed methodologies. The report will provide a basis of discussion between departments and will set the expectations for the content of the Draft and Final EISs.

The report will be used to:

- Facilitate cross departmental dialogue with other city departments;
- Facilitate coordination with other local, state and federal regulatory resource agencies; and,
- Detail the products to be provided by the consultant team for future monitoring purpose.

### **1.4 Report Organization**

This report details the methods to be used in conducting evaluations and preparing each chapter of the EIS. It is organized topically, by EIS technical area and is numbered to correspond with the numbering of each EIS chapter. This methodology report also documents the efforts that will be used to complete the scope of services of STV/Ralph Whitehead Inc., related to preparation of a Draft and Final EIS. Each section of this report describes for a particular EIS technical area the data collection efforts and responsibilities; impact assessment methods; avoidance, minimization and mitigation plans; and, required deliverables related to that EIS technical area.

### **1.5 Work to be Performed by Others**

This Environmental Methodology Report does not address the following evaluations that are to be performed by others, either on the STV/Ralph Whitehead Associates team, or under separate contract to the City: operations planning and cost estimating; travel demand forecasting; and, financial capacity assessment.

It is assumed that the TSM Alternative would include low cost approaches by CATS to address the need for transit improvements in the Northeast Corridor. The TSM Alternative includes the highway and transit improvements associated with the No-Build Alternative, along with additional transit service and facilities to improve service within the corridor and between the Center City and UNC Charlotte. These improvements include skip-stop bus service along North Tryon Street, more frequent service, and the development of eight formal park-and-ride facilities in the corridor. The TSM Alternative will not be presented in the Draft EIS as a build alternative since the Light Rail Alternative was selected as the Locally Preferred Alternative at the conclusion of the Major Investment Study and reaffirmed by the Metropolitan Transit Commission in November 2006. The TSM Alternative would be used as the Baseline Alternative for evaluating the cost-effectiveness of the Light Rail Alternative. Environmental documentation required for implementation of the TSM Alternative would be conducted by CATS in accordance with NEPA.

## **2.0 DATA COLLECTION AND METHODOLOGY**

The following section describes the proposed data collection and impact assessment methodology to be used in preparing the Draft EIS and Final EIS. Section headings are numbered according to the Draft EIS chapter numbering system. Where evaluations of the Light Rail Alternative are described in the following, additional evaluations of the 36<sup>th</sup> Street Design Option and Sugar Creek Design Option will also be conducted and described in the EIS.

## EIS CHAPTERS

### 1.0 PURPOSE AND NEED

This chapter is already completed and is in Draft form. It will be updated as needed using the methods set forth in the existing Draft Chapter 1.0, Purpose and Need. It will also be updated for consistency with Chapter 3.0, Transportation.

### 2.0 ALTERNATIVES CONSIDERED

This chapter is already completed and is in Draft form. It will be updated as needed using the methods set forth in the existing Draft Chapter 2.0, Alternatives Considered. The results of the analysis from the Sugar Creek Design Option Alternatives Analysis will be summarized and added to this chapter. The full report for the Sugar Creek Alternatives Analysis will be added by reference to the chapter.

### 3.0 TRANSPORTATION

A separate Transportation Methodology Report has been completed under separate cover in coordination with CATS and the City of Charlotte's Department of Transportation.

### 4.0 LAND USE AND DEVELOPMENT

#### 4.1 Overview

Chapter 4.0 of the proposed LYNX BLE EIS will describe the existing land uses, proposed future land uses and the consistency of the proposed project with transportation and land use planning efforts aimed at obtaining the land use vision and goals in the *Centers and Corridor Plan (1994)*, *2025 Integrated Transit/Land Use Plan* and *2030 Transit Corridor System Plan*. It will also incorporate any changes to the 1994 *Centers and Corridor Plan* that is in the process of being updated. The proposed project is likely to alter land use and development within the project corridor and this evaluation will analyze the anticipated changes that would result. A description of the project's consistency with land use and development plans, as well as potential impacts and mitigation measures, will be included.

#### 4.2 Study Area

The study area for land use will extend 1,000 feet from each side of the LRT alignment.

#### 4.3 Data Needs

Data collection efforts will focus on documenting the existing conditions of the corridor, including: existing land use, land use development plans and existing development and land use trends. Data needs for the Land Use and Development evaluation will include the following with the City of Charlotte to provide data pertinent to future projections where noted:

- Existing Land Use data layers in GIS (City to provide);
- 2025 Integrated Transit/Land Use Plan (City to provide);
- Centers and Corridors Land Use Vision, 1994 and any updates (City to provide);
- Listing of Major Projects Under Construction or Proposed (City to provide);

- Vacant and Underutilized Land, Geographic Information System (GIS) data layers (City to provide);
- Zoning GIS data layers (City to provide);
- Station Area Plans (City to provide for Final EIS); and,
- Field Reviews/Land Use Inventory.

#### **4.4 Draft EIS Impact Assessment Methods**

Utilizing the work previously completed for the LYNX BLE Draft EIS, as well as the data sources noted above, this chapter will update the discussion of existing land uses in the project corridor, current development trends, relevant land use plans/policies and land use impacts of the alternatives. The No-Build Alternative, which would consider the amount of land to be developed as well as the location of development if existing conditions prevail, will be used as a baseline to measure potential land use and development impacts. Impact assessment will focus largely on how the Light Rail Alternative would impact land use and development within the corridor. The impact assessment will focus on future conditions for each alternative and their consistency with the City's local land use plans and zoning ordinance.

The following items will be analyzed and discussed:

- General description of land use and activity centers
- Description of local plans and regulatory environment
- Description of the Station area planning process
- Assessment of the effects of the proposed project on development (station areas)
- Joint development potential

#### **4.5 Avoidance, Minimization and Mitigation Plans**

The Light Rail Alternative could have an impact on local land use investment decisions, making some areas more or less attractive for development. A review of the availability of developable land and its proximity to resources, accessibility, availability of infrastructure, environmental constraints, and ability to meet zoning and planning requirements will be conducted to address methods for avoiding, minimizing and mitigating negative land use impacts to the extent practicable.

#### **4.6 Final EIS Content**

The Final EIS will incorporate comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design that may occur between the 15 and 30 percent preliminary engineering design stages. The methodology of this section will not change between the Draft and Final EIS. The station area planning process is not expected to be completed before the Draft EIS; therefore, station area plans are expected to be included in the Final EIS.

#### **4.7 Deliverables**

- Draft and Final updated Chapter 4.0, Land Use and Development (Draft and Final EIS).

### **5.0 SOCIO-ECONOMIC CONDITIONS**

#### **5.1 Overview**

The introduction of the proposed new transportation mode into the existing transportation mix

has the potential to change existing socio-economic characteristics over time within the project area. Chapter 5.0 of the EIS will document anticipated changes and their resulting impact on the socio-economic composition of the corridor.

## **5.2 Study Area**

The study area for socio-economic conditions includes all census tracts located within or adjacent to the Light Rail Alternative alignment.

## **5.3 Data Needs**

Previous U.S. Bureau of Census data, Charlotte-Mecklenburg County planning data, as well as previously completed work on the LYNX BLE Draft EIS will be used in this analysis. The following data needs are anticipated for evaluation of socio-economic conditions. Much of the existing data will be obtained from 2000 U.S. Census Data at the regional, county and census tract levels. Data needs include the following with the City of Charlotte to provide data pertinent to future projections where noted:

- 2000 census data for population, income, ethnicity, age, poverty levels, employment and housing;
- Existing employment data including types of employment, and distribution (City to provide);
- Future population projections (City to provide);
- Future employment projections (City to provide);
- Existing and projected housing growth (City to provide);
- Population and employment forecast for Metrolina Counties (City to provide);
- Redevelopment opportunities data from New Starts Supplement report, 2005 Charlotte Northeast Corridor TOD Station Analysis report;
- General discussion of economic generators, economic activities and markets; and,
- Confirmed list of acquisitions and displacements (including impacted on-site parking spaces if available), as identified for the Draft EIS and the Final EIS.

Work previously completed for the BLE Draft EIS will be used to the extent practicable.

## **5.4 Draft EIS Impact Assessment Methods**

Projected data that builds on growth assumptions contained in the *2025 Integrated Transit/Land Use Plan* will be used to predict how changed to transit availability and physical impacts of the light rail construction will affect the Project corridor and the Charlotte region. The impacts of the Light Rail Alternative on population and employment will be evaluated from a transit service and accessibility perspective based on the riders anticipated to be served by light rail stations. Population, housing and employment data will be presented at both the county level and proposed project corridor level for the base year and forecast year (2030). The primary economic focus areas will be locations that are already key activity areas such as Center City, University City and the UNC Charlotte portion of the corridor. The secondary focus areas within the study area will concentrate on new development or existing redevelopment opportunities that are forecast near stations and park-and-ride lots.

## **5.5 Avoidance, Minimization and Mitigation**

The proposed Light Rail Alternative could potentially have both positive and negative impacts on socio-economic conditions within the project corridor and its surrounding areas. A review of anticipated displacements, housing supply impacts (positive and negative) and the potential for



revenue loss will be conducted to address methods for avoiding, minimizing and mitigating negative impacts to the extent practicable.

## **5.6 Final EIS Content**

The Final EIS will incorporate comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design that may occur between the 15 and 30 percent preliminary engineering design stages. The methodology of this section will not change between the Draft and Final EIS.

## **5.7 Deliverables**

- Draft and Final updated Chapter 5.0, Socio-economic Conditions (Draft and Final EIS).

# **6.0 NEIGHBORHOODS, COMMUNITY SERVICES AND ENVIRONMENTAL JUSTICE**

## **6.1 Overview**

The LYNX BLE corridor study area is distinguished by numerous established residential neighborhoods, such as Belmont, Optimist Park, Plaza-Shamrock, Hidden Valley and University City North, to name a few. The assessment of neighborhoods and community services will include an evaluation of the effects of the Light Rail Alternative on the cohesiveness of residential areas (the ability of residents to communicate and interact with each other in ways that lend to a sense of community) and the neighborhood setting in general. Items of importance to people such as mobility, safety, economic effects, relocation, separation, noise and aesthetics will be identified. The process will evaluate the effects of the proposed project on communities and their quality of life.

In addition, Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations) and USDOT Order 5610.2 on Environmental Justice require that all federal agencies identify and address disproportionately high and adverse human health, or environmental effects of federal programs on minority or low-income populations. The general purpose is to foster non-discrimination in federal programs and to provide minority and low-income communities' greater opportunities for public participation in, and access to, public information regarding human health and environmental issues. Areas with potential environmental justice (EJ) issues will be identified in the screening process to ensure that these communities have access to enough concise and clear information to enable them to effectively participate in the public involvement process. The goal of this analysis will be to ensure that no one population segment receives undue hardship or environmental impacts as a result of the proposed project.

## **6.2 Study Area**

The study area for Neighborhoods, Community Services and Environmental Justice conditions includes all census tracts located within or adjacent to the Light Rail Alternative alignment.

## **6.3 Data Needs**

### **6.3.1 Neighborhoods and Community Services**

Data collection efforts will focus on obtaining maps, data and qualitative information on existing conditions, including existing established neighborhoods, proposed neighborhoods,

existing community services and public issues and concerns. Data needs for the neighborhood and community services evaluation will include the following with the City of Charlotte to provide data pertinent to future projections where noted:

- Aerial photography (City to provide) and field verification;
- Delineation of Neighborhood Statistical Areas;
- Identification of schools, churches and other religious institutions, libraries, post offices, community centers, parks, greenways, hospitals, fire stations and police stations;
- GIS data layers showing community facilities (City to provide);
- Community issues/concerns gathered through public involvement;
- Identification of Limited English Speaking populations; and,
- Identification of special populations, e.g., transit-dependent, disabled, elderly.

Work previously completed for the LYNX BLE Draft EIS will be used to the extent practicable.

### **6.3.2 Environmental Justice**

Data will be collected at the block group level for the study area and for Mecklenburg County for comparative purposes (including for minority households, transit- dependent populations and low-income households). Census block group level data, instead of the census tract or block level, will be used because it provides the best combination of demographic accuracy and data accessibility. The entire county has been selected as the appropriate comparison tool because of the potential regional influence of this project and because it best represents the regional project area.

## **6.4 Draft EIS Impact Assessment Methods**

### **6.4.1 Neighborhoods and Community Services**

The evaluation of the impact of the Light Rail Alternative on neighborhoods and community cohesion will include consideration of direct and indirect impacts. In addition to initial reviews of aerial photography and necessary site visits, existing neighborhood travel patterns (physical barriers), land use and community services, including an inventory of existing emergency services (police, fire and EMS) and their locations and routes, will be noted. The types of neighborhood and community service impacts that will be evaluated including the following:

- Property acquisitions and/or displacements;
- Loss of parking spaces/facilities;
- Division of neighborhoods (such as potential physical barriers associated with introducing the Light Rail Alternative into neighborhood environments);
- Social isolation (such as potentially isolating a portion of an ethnic group or neighborhood);
- Facilitating new development;
- Facilitating rehabilitation or reuse of existing development;
- Changes in property values;
- Impacts on neighborhood access;
- Changes in neighborhood identification;
- Changes in access to community facilities and services;

- Traffic and pedestrian safety considerations;
- Impacts on noise receptors;
- Visual impacts; and,
- Impacts on special populations, such as those who are transit-dependent, disabled or elderly.

Previously completed work will be utilized to the extent practicable.

#### **6.4.2 Environmental Justice**

The following tasks will be performed as part of the environmental justice analysis:

1. Establish Environmental Justice Setting - The methodology used to determine the location(s) of low-income and minority populations and their classification(s), as such, will involve establishing a reference population for comparative purposes, in this case, Mecklenburg County. In accordance with the USDOT Order and EO 12898, existing census databases have been reviewed to determine the availability of demographic data for this particular project study area. The 2000 Census demographic databases have been determined to be the most comprehensive and accurate source of information available.
2. Determine Potential for Environmental Benefits and Disproportionate or Adverse Impacts of the Alternatives on Minority and Low-Income Neighborhoods. Impact assessment results from each technical area of the EIS will be described in the Environmental Justice section of the Draft EIS. Direct and indirect effects to EJ communities will be assessed and described, including whether the impacts would be disproportionate or adverse to an EJ defined community. This assessment will consider the following factors:
  - Transportation benefits and impacts, such as changes in transit service, access to transportation services and facilities, and mobility;
  - Changes in the provision of Community Services;
  - Whether or not the project would result in changes that would affect neighborhood cohesion, such as the placement of physical barriers;
  - Alteration of visual/aesthetic characteristics;
  - Impacts to Parklands used by EJ communities;
  - Changes in Air Quality;
  - Noise and Vibration impacts affecting EJ communities;
  - Acquisitions, displacements, and relocations, including an assessment of business impacts by type with regard to changes in access to businesses and services that could potentially impact EJ communities; and,
  - Construction Impacts.

#### **6.5 Avoidance, Minimization and Mitigation Plans**

If disproportionately high adverse impacts would result from the proposed action, mitigation measures or alternatives will be developed to avoid or reduce the impacts, unless CATS finds that such measures are not practicable.

## **6.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

## **6.7 Deliverables**

- Text for Draft and Final updated Chapter 6.0, Neighborhoods, Community Services and Environmental Justice (Draft and Final EIS).

# **7.0 VISUAL AND AESTHETIC RESOURCES**

## **7.1 Overview**

NEPA, as well as other regulations concerning federally funded projects, identifies aesthetics as one of the factors in the human environment that must be considered in an EIS in determining the effects of a transportation project. The aesthetic quality of a community is composed of visual resources (e.g., physical features that make up the visible landscape).

Visual impacts affect communities from two perspectives: the view from surrounding streets and buildings of the transportation improvement as it fits into the pre-existing landscape, and the transit user's view of adjacent land uses from inside the transit vehicle. From either perspective, the view should leave a positive impression and a feeling of community value and pride. Introduction of light rail into the Northeast Corridor can be instrumental in improving the visual quality of areas along the project corridor that are presently considered unattractive, such as areas characterized by older industrial and commercial development, where the dominant visual features often are rear areas of buildings, barbed wire fencing, waste areas, parking lots, and storage tanks. Such areas could also include auto-oriented strip-type development, where the visual landscape is cluttered with excessive signage and a general lack of landscaping and architectural design. Visual impacts of an area are ascertained by defining the existing visual environment; identifying key views in that environment; analyzing visual resources and community perception of those resources; depicting the project appearance; assessing the visual impacts; and, developing mitigation measures.

## **7.2 Study Area**

The study area for visual and aesthetic impacts will generally extend 200 feet from the alignment. At locations where grade separations will occur and structures or retaining walls will be provided, the study area will widen to areas within 1,000 of the alignment in order to examine impacts from a broader viewshed.

## **7.3 Data Needs**

Data for this task will be collected through a combination of field review, photographs and a review of local plans and ordinances relevant to visual and aesthetic considerations.

## **7.4 Draft EIS Impact Assessment Methods**

The visual impact discussion will describe the character of the existing visual environment, identify visually sensitive resources and viewers, and explain potential visual impacts and measures to mitigate adverse impacts. The visual impacts of the proposed rail line, grade

separations and stations will be addressed. Because of a lack of specific guidance from the FTA on this topic, the following Federal Highway Administration publications will be used for guidance: “Guidance for Preparing and Processing Environmental and Section 4(f) Documents” (Technical Advisory T 6640.8A, 1987), and “Esthetics and Visual Quality Guidance Information” (August 1986). The following steps will be taken to define and analyze aesthetic issues:

- Review local plans and ordinances pertinent to visual and aesthetic considerations as they relate to planning for, and constructing, transportation projects;
- Identify the project’s viewshed and inventory the visual features in the study area. These features will include landforms, manmade development, water features and vegetation;
- Describe the existing visual character of the study area, using photographs to illustrate existing conditions;
- Describe the viewer groups in the study area, Include people who will view the project and people who will have a view from the project. Groups potentially having a view of the project can include residents, travelers, workers and shoppers. Groups with a view from the project would include the transit riders (some of whom would also be among the groups having a view of the project);
- Review public input gained from the Station Area planning process;
- Review the NE Corridor Urban Design Framework document as it pertains to visual impacts and mitigation techniques; and,
- Identify visually sensitive locations along the project alignment and categorize as Standard, Tier 1, or Tier 2, as determined by the Urban Design Framework. Describe how the proposed project will change views from these locations, particularly at station sites and bridge structures. Consider the scale and features of the proposed project. Generate 3-D visualizations to assist in the analysis of the visual impacts.

### **7.5 Avoidance, Minimization and Mitigation Plans**

This section will describe measures being incorporated into the project to mitigate visual impacts. These measures can include design components such as landscaping and architectural standards for the station platforms; park-and-ride facilities; transit way; substation locations; bridge structures and retaining walls; and, new roadways and/or access drives to transit facilities. Appropriate techniques will be outlined that can minimize adverse impacts including the location of alignment and use of color, unique or significant construction materials, full cut-off or directed site lighting, artwork opportunities, landscaping, screening, incorporation of architectural features, earthwork and litter control.

### **7.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes that may occur to the project design between the 15 and 30 percent preliminary engineering design stages. The methodology of this section will not change between the Draft and Final EIS.

### **7.7 Deliverables**

- Text for Draft and Final Updated Chapter 7.0, Visual and Aesthetic Considerations (Draft and Final EIS).

## 8.0 HISTORIC, ARCHAEOLOGICAL AND CULTURAL RESOURCES

### 8.1 Overview

This section describes proposed efforts to locate, document, evaluate, and assess effects on and potential mitigation measures related to historic, archaeological and cultural resources for Chapter 8.0 of the Draft EIS. This assessment will be in compliance with federal, state and local guidelines and regulations including:

- Section 106 of the National Historic Preservation Act of 1966, as amended (16 USC§470);
- Protection of Historic and Cultural Properties (36 CFR 800);
- National Register Criteria for Evaluation (36 CFR 60);
- Archaeological and Historic Preservation Act of 1974 (16 USC§469a);
- Archeological Resources Protection Act of 1979;
- Executive Order 11593;
- North Carolina Archaeological Resources Protection Act;
- North Carolina Historic Preservation Office (SHPO); and,
- Charlotte-Mecklenburg Historic Landmarks Commission.

The steps for identifying historic, archaeological and cultural resources and the potential effects the project will have on these resources are outlined in Section 106 of the National Historic Preservation Act of 1966 and within 36 CFR 800, Protection of Historic and Cultural Properties. These include: consultation, identification of historic properties, the assessment of adverse effects and the resolution of adverse effects.

During the prior EIS efforts, a Draft Phase II (Intensive Level) Architectural Resources Survey Report was completed in May 2005 in order to determine which resources were determined to be eligible for, or listed in, the National Register of Historic Places (NRHP). This report was not submitted to the SHPO for concurrence. Since the completion of the May 2005 report, changes in the requirements for a Phase II level investigation by the North Carolina SHPO have taken place. Therefore, this report must be updated to meet the new requirements and account for any changes in project definition, such as the inclusion of the UNC Charlotte alignment. A Draft Phase I Archaeological Survey Report was prepared for CATS but a final document was not prepared and SHPO review did not occur. This report also requires updating to the new standards and the inclusion of the UNC Charlotte alignment.

### 8.2 Study Area

The study area for historic, archaeological and cultural resources is called the “Area of Potential Effects” (APE). The APE will differ between the historic resources and archaeological resources.

The APE for historic resources is the geographic area(s) that includes the proposed right-of-way limits for the project and areas extending outward from the proposed right-of-way limits in which the proposed project may cause direct or indirect changes in the character or use of properties or sites listed or eligible for listing in the NRHP. The APE for historic resources will generally be defined as 150 feet from the centerline of the proposed light rail alignment, except in station areas or grade separation areas where the APE will be extended to a larger area where the potential for impact exists and where structures that may be eligible for the NRHP are located. For stations where there is a potential for the station locations to shift slightly, a larger APE will

be identified. This expanded APE will apply to the following stations: 16<sup>th</sup> Street, 27<sup>th</sup> Street, 36<sup>th</sup> Street, Sugar Creek (LPA alignment, Sugar Creek Design Option and 36<sup>th</sup> Street Design Option), Eastway (LPA alignment, Sugar Creek Design Option and 36<sup>th</sup> Street Design Option), Rocky River, McCullough, University City, UNC Charlotte, and Mallard Creek Church.

The APE for archaeological resources will be defined as the construction-limits of the project and will include site specific investigations for archaeological and cultural resources.

### **8.3 Data Needs**

Data needed for the cultural resources assessment will be collected through a combination of field work and a review of state and local databases, such as those of the Office of State Archaeology and State Historic Preservation Office.

### **8.4 Draft EIS Impact Assessment Methods**

#### **8.4.1 Historic Resources**

The following activities will be completed in order to identify historic resources within the APE:

- Invite interested parties to serve as consulting parties in the identification of historic resources and conduct consultation activities;
- Conduct an architectural resources survey within the revised APE to update earlier findings and to identify any new historic resources that are now 50 years or older or that were outside of the APE of the prior efforts;
- Prepare a Preliminary Summary of Findings with the results from the architectural resources survey and make a presentation of these findings to the SHPO for review and comment;
- Prepare Phase II technical report to include historic background essay, any relevant historic/architectural contexts and intensive level evaluations of eligibility for each property which appears to warrant such level of investigation. A deed search is required under the new North Carolina SHPO guidelines and will be conducted for each property to be evaluated at the intensive level;
- Prepare North Carolina Historic Preservation Office survey database forms (MS Access) and files for all properties within the APE which appear to be 50 years of age or older. Within the North Charlotte Historic District, survey files will be prepared only for those resources located within the APE;
- Consult with the Charlotte-Mecklenburg Landmarks Commission and any other identified consulting party; and,
- Submit Phase II Historic Resources Survey Report to SHPO for review and concurrence on determinations of eligibility.

Once the Phase II report is submitted to the SHPO for review/concurrence, efforts will commence to prepare the Evaluations of Effects Report and determine the potential effects of the project by applying the Advisory Council on Historic Preservation's criteria for adverse effects, which includes the:

- Physical destruction, damage or alteration of all or part of the property;

- Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and,
- Transfer, lease or sale of the property.

The effects identified in the Evaluation of Effects Report will be presented in the Draft EIS. It is expected that a SHPO review and concurrence on effects evaluations will occur prior to the publication of the Draft EIS. If SHPO response is not provided within 30 days, the consultant-recommended effects determinations may be used in the circulated Draft EIS and then updated for the Final EIS with the SHPO's final concurrence. The following activities will be completed in order to identify the impacts of the project on historic resources:

- Apply criteria for adverse effect and prepare Evaluations of Effects Report; and,
- Submit Evaluations of Effects Report to CATS for transmittal to SHPO.

#### **8.4.2 Archaeology**

The following activities will occur to identify archaeological and cultural resources within the APE and evaluate the potential effects of the project:

- Update the Area of Potential Effects (APE) based on the addition of the UNC Charlotte Station, new or changed station locations, grade separations and retaining walls that were not defined for the previous survey;
- Review the records at the Office of State Archaeology (OSA) to update the previous research and historic context section of the 2006 archaeological survey report;
- Conduct an archaeological survey of the UNC Charlotte Station alignment and additional areas of potential ground disturbance. The survey will locate, identify and assess the potential of any recorded sites for eligibility for the National Register of Historic Places (NRHP);
- Update the 2006 survey report. Recommendations for potential eligibility for each recorded site will be made;
- Submit the revised report to CATS for transmittal to the State Historic Preservation Office (SHPO) for review and concurrence of recommendations; and,
- Conduct evaluative testing, if warranted, on any sites within the APE that appear potentially eligible for the NRHP. The testing should result in a recommendation regarding eligibility.

#### **8.5 Avoidance, Minimization and Mitigation Plans**

If adverse effects are identified for a site that is recommended eligible for, or is listed in, the NRHP, options to resolve those adverse effects will be defined in consultation with the SHPO and consulting parties.

#### **8.6 Final EIS Content**

The Final EIS will include SHPO determinations of effects for historic, archaeological and cultural resources. The Final EIS will also update any additional consultation activities that will



have occurred between the Draft and Final EISs

## **8.7 Deliverables**

- Draft and Final updated Archaeological Identification Survey Report.
- Draft and Final updated Phase II Historic Resources Survey Report.
- Draft and Final Evaluations of Effects Report (Historic Resources).
- Text for Draft and Final updated Chapter 8.0, Cultural, Historic and Archaeological Resources (Draft and Final EIS).

## **9.0 PARKLANDS**

### **9.1 Overview**

As a result of the implementation of the Project, potential environmental impacts and benefits could occur to existing and planned public parklands, including public parks, greenways, recreation areas and wildlife and waterfowl refuges. The Light Rail Alternative would primarily use existing railroad and roadway right-of-way. Therefore, impacts to parklands in the study area should be minimal. However, the potential footprint of station areas requires further evaluation of parks, greenways and other recreational properties that could be affected along the corridor. Implementing the Light Rail Alternative also could be beneficial to parkland since station areas could be designed to include public spaces that could serve a park-like function in certain neighborhoods and access improvements would be expected through proper station area planning.

### **9.2 Study Area**

The study area for parks and recreation will extend 1000 feet on either side of the Light Rail Alternative alignment.

### **9.3 Data Needs**

- State and County parks and recreation data and maps (City to provide).
- Mecklenburg County Greenway Plans (City to provide).

### **9.4 Draft EIS Impact Assessment Methods**

#### **9.4.1 Review of Resource Information**

The evaluation methods used to describe impacts to parkland will update previously completed work and incorporating the UNC Charlotte alignment. It will involve a review of available State and County parks and recreation database information/maps to identify any existing or potential lands utilized or to be utilized for park or open space activities located in the study area. Identification of real or potential lands utilized as parks or open space activities will be limited to updating previously completed work and incorporating the UNC Charlotte alignment. Specific information to be collected includes park name, boundaries (from tax mapping or other source as required), distance to proposed rail right-of-way, park use (public/private), designated recreational uses/functions, land area, ownership, physical appurtenances, access and relationship to similarly used lands in the vicinity and Section 4(f)/Section 6(f) applicability. This information will be obtained through a combination of literature search and field visits.

### **9.4.2 Field Visit**

A field visit will be conducted to confirm the presence/location and determine characteristics of parklands. Other environmental features contained within these park areas (i.e. wetlands, streams, floodplain areas, wildlife habitat and unique vegetation) will be noted.

### **9.4.3 Assessment of Impacts**

The boundaries of identified public parklands located within proximity to the proposed project corridor will be compared to the City's GIS layer for parks. The Light Rail Alternative GIS layer will be overlaid to determine impacts. Direct impacts, including permanent uses, temporary uses, and constructive uses, will be calculated in acreages and /or linear feet, as applicable, and will be included in the Draft EIS and Final EIS. Indirect impacts will be quantified by identifying the distance from each parkland within the study area. The type of activities occurring within each park where proximity impacts are likely to occur will be noted and any interference with activities designated to occur within each park will be identified as an indirect effect.

## **9.5 Avoidance, Minimization and Mitigation Plans**

In accordance with Section 4(f) of the U.S. Department of Transportation, the use of parklands will be avoided if at all possible. Efforts to minimize the use of Section 4(f) properties will be avoided if possible and a least harm alternative will be developed.

## **9.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

## **9.7 Deliverables**

- Text for Updated Chapter 9.0, Parklands (Draft and Final EIS).

# **10.0 SECTION 4(f)**

## **10.1 Overview**

Section 4(f) of the U.S. Department of Transportation Act of 1966, as amended, protects historic and cultural resources, public parks and wildlife refuges from conversion to transportation uses unless: (1) it can be demonstrated that there is no feasible or prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreation area, wildlife and waterfowl refuge, or historic sites resulting from such use. Section 4(f) applies to historic sites regardless of ownership, but only to publicly-owned parks, recreation areas and refuges. A Section 4(f) Evaluation will be included in the Draft EIS if a use of Section 4(f) resources is determined.

## **10.2 Study Area**

The study area for the Section 4(f) Evaluation will be the same as the study areas for parks, historic, archaeological and cultural resources. The properties that would be used by the Light Rail Alternative that would constitute a permanent, temporary or constructive use under the

regulations will be evaluated.

### 10.3 Data Collection

Data from the Section 4(f) Evaluation will rely upon data contained in the assessments for historic, archaeological and cultural resources; parklands; and, natural resources investigations.

### 10.4 Draft EIS Impact Assessment Methods

The Draft EIS will include a Section 4(f) Evaluation. Assessments methods will include the identification of a “use” that would be permanent, temporary or constructive. For properties that have an identified “use”, the Section 4(f) Evaluation will document and assess the extent of the impact to the 4(f) resource in terms of linear feet or acres and whether feasible and prudent alternatives exist to avoid the 4(f) resource.

Key activities for assessing feasible and prudent alternatives will include:

- Documentation of avoidance alternatives developed during station site location and planning analysis; and,
- An evaluation of whether or not the avoidance alternatives are *feasible*, meaning if it cannot be built as a matter of sound engineering judgment, or *prudent*, which is defined as whether or not it: 1) compromises the project that it is unreasonable to proceed with the project; 2) results in an unacceptable safety or operational problems; 3) after mitigation, it would still cause severe impacts to other resources; 4) it results in additional construction, maintenance or operations costs of an extraordinary magnitude; 5) causes unique or unusual problems; or 6) it involves multiple factors listed above that cumulatively cause unique problems or impacts of an extraordinary magnitude.

### 10.5 Avoidance, Minimization and Mitigation Plans

In accordance with Section 4(f) of the U.S. Department of Transportation the use of historic and cultural resources, public parks and wildlife refuges parklands, will be avoided if at all possible. If avoidance is not feasible, efforts to minimize the use of Section 4(f) properties will be made and a least harm alternative will be developed. If a 4(f) avoidance alternative cannot be developed, the Section 4(f) Evaluation will identify why avoidance alternatives are not feasible and prudent in accordance with Section 4(f) guidance.

### 10.6 Final EIS Content

The Final EIS will contain a Section 4(f) Statement that will document all possible planning to reduce harm to Section 4(f) resources and will include coordination documentation from Section 4(f) resource officials, including but not limited to the SHPO and State and County parks providers. The 4(f) Statement will address comments from the U.S. Department of Interior, and any other public and agency official, that may have provided comments during the Draft EIS public comment period. The Final EIS will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans.

### 10.7 Deliverables

- Text for Chapter 10.0, Section 4(f) Evaluation (Draft and Final EIS).

## 11.0 NATURAL RESOURCES

### 11.1 Overview

This section of the EIS will evaluate the impacts of the alternatives on ecosystems including: existing threatened and endangered species (fish, plants and wildlife), habitats and flora. The impact evaluation process will be focused on identifying both beneficial and adverse impacts. Where potential adverse impacts are identified, design modifications and mitigation measures will be identified to reduce or eliminate the impact.

### 11.2 Study Area

Data collection for natural areas will be made for a corridor-wide area; however, the impact assessment will be limited to a study area to be defined as the construction limits of the Light Rail Alternative alignment and stations.

### 11.3 Data Needs

Input regarding the relevant resource areas will be collected from a review of US Fish and Wildlife Service (USFWS) Threatened and Endangered Species databases, NC Heritage's *Classification of the Natural Communities of North Carolina*, Mecklenburg County Soil Survey, aerial photography, topographic maps and a technical staff field investigations. The most current data from local sources and recent aerial photography, supplemented by limited field work, will be used in the analysis.

### 11.4 Draft EIS Impact Assessment Methods

The City and Consultant have determined that the endangered resources species surveys conducted in the Fall of 2007 adequately addressed endangered species for the LPA, the Sugar Creek Design Option, 36<sup>th</sup> Street Design Option and the 2006 definition of UNC Charlotte alignment.

The environmental evaluation for this study will begin with a broad review of environmental factors to identify notable issues and constraints. Some of these factors and considerations were documented during project scoping or were further evaluated in the Northeast Corridor MIS. Where relevant, this information will provide the starting point for the environmental analysis. The environmental analysis will require that the alternatives be evaluated at a level of detail that may impact design. The focus will be on site-specific impacts, the significance of these impacts and what mitigation measures may be required. Consultation with resource agencies will determine further consultation/coordination required with respect to project impacts, mitigation and permitting.

#### 11.4.1 Plant Communities

The assessment of plant or floral communities will largely rely on the survey previously conducted in the project corridor in Fall 2007. This information will be supplemented with a review of natural communities. Natural communities in the study area will be categorized using the NC Heritage's *Classification of the Natural Communities of North Carolina* document and determined from aerial photography and select ground truthing. Since the project corridor is largely urbanized, it is anticipated that only elements of the original natural community may remain in the study area. These plant communities within the study area will be categorized and depicted on aerial photography.

### **11.4.2 Wildlife**

The County's Demographic, Employment and Land Development (DELD) database will be utilized for water resources, parklands, open space areas and natural areas. USGS maps, National Wetland Inventory (NWI) maps, Mecklenburg County Soil Survey and other published sources will be reviewed as needed. Aerial photography will be reviewed and a field visit will be conducted to identify quality wildlife habitat along the corridor that might contain threatened and endangered species.

### **11.4.3 Farmlands and Forests**

Impacts to forest resources will be determined using the site productivity index in the soil survey. No analysis will occur in those portions of the alignment where the land has been developed. AD-1006 forms will be submitted to the State Conservationist to obtain information on the farmland resources.

### **11.4.4 Protected Species**

Work previously completed for threatened and endangered species will be used for this section of the document. Previous findings will be augmented and presented in NEPA format to include tables of county-listed federally protected species and their current status; locations of nearest populations; habitat requirements; physical descriptions and blooming periods; and, biological conclusions.

## **11.5 Avoidance, Minimization and Mitigation Plans**

The results of the field work will be included in the GIS database for the Project. The avoidance and minimization of impacts will be made to the extent possible. Where impacts are unavoidable, mitigation plans will be developed and incorporated into the Draft EIS.

## **11.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

## **11.7 Deliverables**

- Text for updated Chapter 11.0, Natural Resources (Draft and Final EIS).
- Revised Natural Resources Technical Memo (Draft and Final).

# **12.0 WATER RESOURCES**

## **12.1 Overview**

Water resources (groundwater, surface waters, floodplains/floodways and wetlands) will be analyzed to determine potential impacts of the project alternatives. The impact evaluation process will be focused on identifying both beneficial and adverse impacts. Where potential adverse impacts are identified, design modifications and mitigation measures will be identified to reduce or eliminate the impact.

## **12.2 Study Area**

The study area for water resources will vary according to the technical resource area. The study area for groundwater resources will extend 500 feet from the alignment. The study area for surface area water resources and floodplains will include the streams and rivers within the larger watershed and the project corridor. The study area for wetland delineation will be limited to the construction limits of the project where site specific impacts would result; however, wetlands within the larger project corridor will be noted through field reports.

## **12.3 Data Needs**

Input regarding the relevant resource areas will be collected from a review of topographic mapping, County soil surveys, National Wetlands Inventory (NWI) maps, Division of Water Quality (DWQ) Basin wide Management Report, FIRM maps and technical staff field investigations. The most current data from local sources and recent aerial photography, supplemented by limited fieldwork, will be used in the analysis.

## **12.4 Draft EIS Impact Assessment Methods**

The environmental evaluation for this study will begin with a broad review of environmental factors to identify notable issues and constraints. Some of these factors and considerations were documented during project scoping or were further evaluated in the Northeast Corridor MIS. Where relevant, this information will provide the starting point for the environmental analysis. The environmental analysis will require that the alternatives be evaluated at a level of detail that may impact design. The focus will be on site-specific impacts, the significance of these impacts and what mitigation measures may be required. Consultation with resource agencies will determine jurisdictional status and further consultation/coordination required with respect to project impacts, mitigation and permitting.

### **12.4.1 Groundwater**

The Draft Natural Resources Technical Memorandum (June 2006) will be used to complete this section. The Mecklenburg County Well Information System will be checked for any newly located wells along the project alignment. The areas of alignment changes and station changes will be examined to see if there is a change in project impacts over what was reported in the June 2006 document.

### **12.4.2 Surface Waters and Wetlands**

Surface waters and other potential waters of the U.S. within the project corridor will be identified. Potential waters of the U.S., including streams, ponds, and other surface waters located within the study area, will be evaluated utilizing the new (June 2007) U.S. Army Corps of Engineers (USCOE) 'Approved Jurisdictional Determination Form' and marked in the field with numbered plastic surveyor's tape for subsequent U.S. Army Corps of Engineers (USCOE) verification. The locations of surface waters will be mapped utilizing a Global Positioning System (GPS) unit capable of sub-meter accuracy.

An assessment of stream channels intersecting the study area will be conducted to document, using USCOE and NC Division of Water Quality (NCDWQ) guidance, the functional status and quality of jurisdictional stream channels. This assessment will include observations along selected stream segments, field sampling with a D-shaped dip net at various stream locations and the completion of stream assessment forms. Stream channels will be assessed utilizing the USCOE's "Stream Quality Assessment Worksheet," as well as

the NCDWQ's "Stream Classification Form." The functional assessment, i.e., intermittent or perennial, and quality or 'aquatic importance' of a channel will play an integral role in subsequent permitting and/or mitigation requirements. A subsequent field review with the USCOE will be conducted to verify the aquatic importance of stream channels.

Wetlands will be identified through field visits along the project corridor. Wetlands will be defined using the Routine On-Site Determination method as described in the 1987 *Corps of Engineers Wetlands Delineation Manual*. This technique uses a multi-parameter approach, which requires positive evidence of the following three criteria: a) hydrophytic vegetation; b) hydric soils; and, c) wetland hydrology indicators. Areas within the study area exhibiting the above three characteristics will be considered wetlands and will be marked in the field with numbered plastic surveyor's tape for subsequent USCOE verification. Brief functional assessments of wetlands located in the study area will also be conducted. The locations of waters of the U.S., including wetlands, will be mapped utilizing a GPS unit capable of sub-meter accuracy.

Upon completion of the delineation of wetlands and stream assessments, the necessary documentation to request a site visit by a representative of the Wilmington District USCOE to verify the jurisdictional boundaries will be prepared. This 'request for jurisdictional determination' (JD) package will include new (June 2007) USCOE-promulgated approved jurisdictional determination forms, a USGS map of the subject site, a USDA soil survey map, completed Routine Wetland Determination and stream evaluation forms, an Approximate Waters of the U.S. and Wetlands Boundary Map depicting the boundaries of GPS-located jurisdictional waters and wetlands, and representative photographs. A subsequent field review with the USCOE will be conducted to verify delineated boundaries of wetlands.

#### **12.4.3 Floodplains and Regulatory Floodways**

A review of map products of Flood Insurance Studies completed by the Federal Emergency Management Agency (FEMA) will be conducted to assess potential development restrictions in the project corridor. Flood Insurance Rate Maps (FIRM) and local Floodplain Land Use Maps (FLUM) products will be reviewed to identify the extent of the potential flood hazard along the project corridor. Special flood hazard areas within the study area will be demarcated on base maps to allow an assessment of potential development conflicts with these areas. The Draft EIS will include 15 percent design plans and will identify techniques to reduce storm water drainage resulting from the project alignment and park-and-ride facilities.

#### **12.4.4 Surface Water Improvement and Management Plan (SWIM) Buffers**

Surface Water Improvement and Management Plan (SWIM) buffer rules will apply to the Light Rail Alternative. The assessment will examine where impacts to SWIM buffers apply.

#### **12.4.5 Water Quality**

Water quality in the project corridor will be qualitatively assessed through a combination of field observations and literature review. Surface waters will be discussed in the context of the river basin, sub-basin, hydrologic unit, as well as stream classifications as established by NCDWQ. Data from ambient water quality and macro invertebrate monitoring stations maintained by both the County and State proximal to the project corridor will be reviewed. Additional literature to be reviewed will include the 303(d) list of impaired waters and the

basin wide assessment reports and water quality plans promulgated by NCDWQ, including listings of National Pollution Discharge Elimination System (NPDES) permitted dischargers. Local water quality requirements, including the City's recently adopted Post-Construction Controls Ordinance, will be addressed. The role that storm water and drainage issues in the project corridor potentially have on water quality in the study area will be assessed, incorporating the findings of the preliminary drainage assessment. A brief overview of key storm water infrastructure will be provided, including notable outfall locations.

## **12.5 Avoidance, Minimization and Mitigation Plans**

An overlay of USCOE-verified jurisdictional boundaries and preliminary design drawings will allow an initial assessment of project impacts to surface waters and wetlands and the development of possible permitting scenarios and conceptual mitigation strategies. Conceptual mitigation opportunities in and immediately adjacent to, the study area will be assessed.

## **12.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. Calculation of storm water drainage will not occur prior to the Draft EIS publication; therefore, these initial storm water calculations and specific techniques at each park-and-ride facility will be determined at the 30 percent design level. This information will be included in the Final EIS.

## **12.7 Deliverables**

- Text for updated Chapter 12.0, Water Resources (Draft and Final EIS).
- Request for Jurisdictional Determination.
- File of USCOE-verified wetland boundary GPS coordinates.

# **13.0 AIR QUALITY**

## **13.1 Overview**

### **13.1.1 Macro-scale Air Quality**

The discussion of air quality considerations (macro-scale) will be focused on the applicability of project level transportation conformity, which is determined based on whether the proposed project is located in an area that is either in non-attainment or maintenance status based on National Ambient Air Quality Standards (NAAQS). Project level conformity requires the existence of a currently conforming plan and program at the time of NEPA approval for the environmental documentation. The environmental documentation must contain verification that the design concept and scope of the project is the same at the NEPA approval stage as the design concept and scope in the currently conforming plan and program. The Charlotte region is currently in attainment for all NAAQS standards, with the exception of ozone. The U.S. EPA classified the region as non-attainment for ozone pollution.

It is expected that implementation of the project could change travel patterns and alter traffic conditions in the region. The change in regional mobile source emissions is related to the total number of vehicle trips, vehicle miles of travel (VMT) and vehicle hours of travel (VHT) throughout the urban area. Since the purpose of the project is to provide and promote the use of transit, the project is expected to shift some highway trips to transit, which would in



turn help to reduce vehicle trips and VMT. Therefore, it is expected that regional emissions would be reduced, resulting in a net air quality benefit.

### **13.1.2 Micro-scale Air Quality**

The micro-scale analysis is focused on the project level carbon monoxide (CO) hot spot analysis for all projects in all geographic areas regardless of the attainment status of the air quality region.

The micro-scale air quality analysis for the Light Rail Alternative will use standard dispersion models to predict carbon monoxide concentrations at selected roadway intersections and in project-related parking facilities in accordance with the "Guidelines for Evaluating the Air Quality Impacts of Transportation Facilities" (NC Division of Air Quality, September 2007). The results of the analyses will be compared to the NAAQS to determine impacts. In addition, the Mecklenburg County Air Quality Ordinance will be reviewed to determine permit requirements for parking lots and garages.

### **13.1.3 Particulate Matter**

The Charlotte-Mecklenburg region is in attainment for PM<sub>10</sub> and PM<sub>2.5</sub>; therefore, an assessment of the impacts of particulate matter will not be included in the Draft or Final EIS.

## **13.2 Study Area**

The study area for air quality assessment is the entire region. Project-specific details to evaluate project level impacts will come from the transportation data and specific intersection performance levels and vehicle delay information.

## **13.3 Data Needs**

- Vehicular traffic data and projections for roadway intersections affected by the Project and for proposed park-and-ride lots.
- Data on existing air quality in the project study area from the NC Division of Air Quality and Mecklenburg County Department of Environmental Protection.
- Age distribution and other available input values.

## **13.4 Draft EIS Impact Assessment Methods**

### **13.4.1 Macro-scale Air Quality**

Pursuant to the 1990 Clean Air Act Amendments (CAAA) and NC Division of Air Quality guidelines, transportation conformity will be performed locally at the systems planning level by the MUMPO, utilizing accepted regional emissions analysis methodologies and tools. The No-Build and Light Rail Alternative will be analyzed. It must be demonstrated that the Project will not violate the carbon monoxide (CO) NAAQS. In order for the Light Rail Alternative to advance to the final engineering phase it must be documented that:

- the Project comes from a conforming long-range transportation plan (LRTP);
- the Project is included in the urban area's currently approved Transportation Improvement Program (TIP);
- the Project is in conformance with the State Implementation Plan (SIP) pursuant to the CAAA of 1990; and,

- the Project's design concept and scope are the same as those which are found in the conforming plan and TIP.

For the purposes of completing the project-level evaluation for air quality, it is assumed that the Light Rail Alternative will continue to be part of a conforming LRTP and TIP. Therefore, the tasks and activities involved in substantiating project level conformity for air quality include the following:

- Description of air quality setting;
- General description of the sensitive receptors in the study area;
- Description of status of attainment for each of the NAAQS pollutant standards;
- Verification that the Light Rail Alternative's design concept and scope assumed during the MIS phase have not significantly changed;
- Summary of the air quality impacts of the Light Rail Alternative and No-Build Alternative, with indication of whether a CO, HC or NOx standards will be exceeded;
- Comparison of the Light Rail Alternative and No-Build Alternative annual VKT/VMT/VHT, yearly emissions for CO, HC and NOx, with indication of the percentage change from No-Build Alternative;
- Summary of all coordination with other agencies and their comments;
- Verification that the Project is in the current FHWA/FTA approved conforming TIP and LRTP;
- Verification of Project's conformance with the SIP; and,
- Notation that the Conformity Determination Report (MUMPO) is available, which includes the Light Rail Alternative.

#### **13.4.2 Micro-scale Air Quality**

The following key activities will take place in order to assess air quality impacts on a micro-scale level:

- Obtain and review vehicular traffic data and projections for roadway intersections affected by the Project and for proposed park-and-ride lots;
- Obtain and review data on existing air quality in the project study area from the NC Division of Air Quality and Mecklenburg County Department of Environmental Protection;
- Based on the traffic data provided, select modeling locations for the micro-scale CO analysis. These locations will include roadway intersections impacted by project-generated automobile traffic and Project parking lots;
- Obtain the MOBILE6.2 input parameters appropriate for Mecklenburg County, North Carolina. Use MOBILE6.2 to estimate vehicular emissions factors;
- Identify receivers to be input for each modeled location. The receivers will include residences, schools, parks, sidewalk areas and other areas where people may stay for an extended period of time (over one hour);
- Run CAL3QHC for vehicular traffic to estimate one-hour and 8-hour carbon monoxide concentrations at roadway intersections. Use the computer model PAL to model carbon monoxide concentrations at parking lots;
- Compare the results from the models with the National Ambient Air Quality Standards (NAAQS) for carbon monoxide; and,
- Prepare a report summarizing the results of the study.

### **13.5 Avoidance, Minimization and Mitigation Plans**

For areas where there are predicted impacts, mitigation measures will be identified that could include recommendations for intersection improvements and/or changes to park-and-ride facility designs.

### **13.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

### **13.7 Deliverables**

- Draft and Final Air Quality analysis report, including MOBILE6.2 modeling.
- Draft and Final text for new Chapter 13.0, Air Quality (Draft and Final EIS).

## **14.0 NOISE AND VIBRATION**

### **14.1 Overview**

This chapter of the EIS will evaluate the potential noise and vibration impacts resulting from the construction and operation of the Light Rail Alternative. This section will assess long-term changes in the noise and vibration environment based on the operation of light rail service. The focus of the analysis is on the effects of the alternatives (No-Build vs. Light Rail Alternative) compared to existing conditions in the immediate vicinity of the proposed improvements. Special consideration will be given to sensitive receptors (e.g., concert halls, theaters, auditoriums, meeting centers, etc.) and land uses within 700 feet of the project corridor.

The goal in noise and vibration evaluation is to minimize the adverse impacts to the community and to provide reasonable and feasible noise and vibration control where necessary and appropriate. In locations where noise and vibration criteria would be exceeded, various mitigation measures can be implemented to mitigate most impacts, such as noise barriers, sound insulation and the use of ballast mats to help mitigate light rail vibration impacts.

The principle source of existing noise and vibration associated with the proposed light rail alignment is motor vehicles operating on adjacent roadways and freight trains operating on the main Norfolk Southern Railroad (NSRR) freight tracks. Light rail noise and vibration impacts typically include normal train operation and wheel squeal, traffic noise, and the noise impacts of at-grade crossing signal systems (e.g., warning bells).

### **14.2 Study Area**

The study area for noise and vibration will extend 350 feet unobstructed views and 225 feet from the alignment where there are obstructed (for each side of the Light Rail Alternative alignment).

### **14.3 Data Needs**

- Scaled maps and aerial photographs (cut sheets) showing the alignment and parking.
- Scaled maps of all realigned or newly created roadway segments.
- Land use map and information along corridor.
- Letter of introduction for consultant staff.

- Information on existing and future rail activity (schedules, average speeds, number of cars, etc.).
- The type and model of locomotive and cars for future trains.
- Peak hour existing and future traffic data (includes vehicle volume, speed and vehicle mix).

#### 14.4 Draft EIS Impact Assessment Methods

- Establish/characterize existing noise/vibration environment in the study area (baseline).
- Complete field review/mapping of potential noise/vibration sensitive receptors in the area of immediate impact. Up to 25 locations will be monitored for noise and up to five locations will be monitored for vibration, including sensitive receptors on the UNC Charlotte campus.
- Compile Reference Documents and establish noise and vibration criteria/thresholds, including:
  - *FTA Noise Guidelines for Transit Projects* – based on categorization of noise sensitive land use.
  - *FTA Vibration Criteria* – impact criteria for ground-borne vibration.
  - *FHWA Highway Traffic Noise Criteria* – applicable to sensitive receptors.
  - *APTA Noise Guidelines* – design goals for community noise, noise impact thresholds (train operations and maintenance facilities).
  - *USDOT Construction Noise/Vibration Criteria* – existing noise, absolute noise during construction, duration and adjacent land use.
- State/City/County applicable rules and regulations.
- Establish Measurement Program based on land use (sensitive receptors) and complete ambient field measurements (existing conditions).
- Perform Noise and Vibration Impact Assessment by type of impact (e.g., light rail noise, traffic noise, light rail/NSRR noise and vibration).
- Identify potential mitigation options.

#### 14.5 Avoidance, Minimization and Mitigation Plans

In locations where noise and vibration criteria would be exceeded, various mitigation measures will be evaluated. These include noise barriers, sound insulation and the use of ballast mats to help mitigate light rail vibration impacts.

#### 14.6 Final EIS Content

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The Final EIS will include specific mitigation techniques that CATS will commit to putting in place to minimize noise and vibration impacts.

#### 14.7 Deliverables

- Draft and Final Noise and Vibration analysis report, including Traffic Noise Model (TNM) modeling.
- Text for Draft and Final updated Chapter 14.0, Noise and Vibration (Draft and Final EIS).

## 15.0 ENERGY USE

### 15.1 Overview

Energy is consumed in the construction, maintenance and operation of transportation systems. Transportation energy is generally discussed in terms of direct and indirect energy consumption. Direct energy involves all energy consumed by vehicle propulsion together with that energy consumed to support vehicle operation, such as guideway and station lighting. Indirect energy consumption involves the one-time, non-recoverable energy expenditure involved in constructing the physical infrastructure associated with a project.

Energy is commonly measured in terms of British thermal units (BTUs), or the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit. This provides a comparison of energy consumption for energy produced from different sources, such as petroleum, coal, nuclear, wind power.

### 15.2 Study Area

The study area for energy use is the project corridor.

### 15.3 Data Needs

Estimates of vehicle miles of travel and vehicle hours of travel will be needed from the City's ridership modeling consultant.

### 15.4 Draft EIS Impact Assessment Methods

#### 15.4.1 Direct Energy Use

Transportation system operation energy analysis calculates vehicle propulsion consumed under the No-Build and Light Rail Alternative using estimates of annual Vehicle Miles Travel (VMT) and average speed (mi/hr). This analysis produces the following data:

- Net 2030 Transportation Operations Energy Consumption; and,
- Percent savings in energy use for vehicle propulsion (No-Build versus Light Rail Alternative) requirements.

The direct energy consumption will be based on factors found in the *Transportation Energy Data Book, Edition 26*, U.S. Department of Energy, 2007. It will be consistent with and based on the ridership modeling consultant's estimates of VMT and vehicle hours of travel (VHT) as developed using the regional travel model.

#### 15.4.2 Indirect or Construction Energy Use

Construction energy factors estimate the amount of energy necessary to extract raw materials, manufacture and fabricate construction materials, transport materials to the worksite and complete the construction activities. Construction energy use will be quantified based on miles of track constructed at grade, fill and elevated structures. Typically, construction energy expended is offset relatively soon by the savings in operating energy consumption by the project.

Given the uncertainty of field variables at this point in the analysis, accurate, detailed

indirect energy costs will be extremely difficult to estimate with point-level accuracy. The indirect energy values that will be calculated should be considered as indicators between alternatives, rather than as absolute values. The indirect energy consumption will be based on factors found in *Draft Energy Analysis Guidelines for Project Level Analysis* (New York State Department of Transportation 2003).

### **15.5 Avoidance, Minimization and Mitigation Plans**

City of Charlotte and CATS policies to reduce energy consumption will be identified in order to minimize impacts resulting from the use of energy to power the Light Rail Alternative.

### **15.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

### **15.7 Deliverables**

- Text for Draft and Final new Chapter 15.0, Energy Use (Draft and Final EIS).

## **16.0 HAZARDOUS AND CONTAMINATED MATERIALS**

### **16.1 Overview**

Assessment of hazardous and contaminated materials impacts relates to the identification, evaluation and recommendations concerning potential contamination problems within and/or adjacent to the existing or proposed right-of-way for the Light Rail Alternative. Discovery of contamination will have an impact on the project in terms of costs, alignment (right-of-way), design considerations, mitigation measures, schedule, etc. Therefore, identification of areas with potential for contamination early in the project development process is the preferred approach. The contamination evaluation will begin early in the EIS process and continue in ever-increasing degrees of detail as the alignment and station area locations are defined.

The City and Consultant have determined that the previously completed work on the Hazardous and Contaminated Materials chapter adequately addresses the Locally Preferred Alternative (LPA), the Sugar Creek Design Option and 36<sup>th</sup> Street Design Option. The services required for this effort include updating the previously completed work, as necessary, and conducting a Phase I investigation of the UNC Charlotte alignment.

### **16.2 Study Area**

The study area for hazardous and contaminated materials varies depending on the level of information being collected. The original records research for previously reported contamination included a study area extending 1,300 feet (650 feet on each side) from the Light Rail Alternative alignment. The limited Phase I Environmental Site Assessment efforts were completed for properties that would require full acquisition for the Light Rail Alternative station locations. The same study area is recommended for the continuing efforts and for the UNC Charlotte alignment and station location.

### **16.3 Data Needs**

An EDR report for the entire alignment, the UNC Charlotte alignment, station areas and the

park-and-ride locations under consideration will be required as the EDR report obtained during the prior efforts is now beyond an acceptable date for use in the Draft EIS.

#### **16.4 Draft EIS Impact Assessment Methods**

A contamination screening evaluation will be conducted for each property within the proposed UNC Charlotte alignment. The initial assessment will identify contamination potential within the proposed right-of-way limits, and/or from adjacent properties that could affect the proposed right-of-way through migration of the adjacent contamination. A second factor will evaluate the potential impacts from construction. Screening will also recommend potential contamination sites requiring further investigation in future phases of the project development process. This evaluation system will allow for a determination of sites with both a high potential to discover contamination as well as high impact sites. Data to be collected for each property will be based on the likelihood of the potential for involvement with contamination. The process is described below.

##### **16.4.1 Ownership and Land Use**

The screening will identify the current legal owner and previous owners of each property impacted by the proposed alignment, including the property's use (current and previous) and type of business.

##### **16.4.2 Contaminants**

The screening will identify potential contaminants based on type of business (existing or previous).

##### **16.4.3 Regulatory Agencies**

The screening will consider information obtained from regulatory agencies concerning past, present and future enforcement actions that could impact property located along the proposed alignment. Example records include compliance inspection reports, enforcement notices, contamination assessment reports, remedial action plans, etc. This information is available from the US EPA, NCDENR, and Mecklenburg County DEP, among other sources.

##### **16.4.4 Aerial Photography**

A review of current aerial photography will be completed. Potential sources of contamination such as landfills, storage areas, drums, tanks, landscaping and ground staining from spills that may be difficult to see from site visits alone can sometimes be identified by means of aerial photography.

##### **16.4.5 Interviews**

Interviews with local public officials and agencies can help to identify potential contamination problems along the proposed right-of-way. Residents and property owners along the corridor often have valuable information concerning historical uses of property. Such contacts will be made in those areas where contamination is suspected to exist.

#### **16.4.6 Site Visits**

Site visits are required to verify listed hazardous materials and petroleum contamination sites and to identify and investigate any previously unrecorded sites.

#### **16.4.7 Property Ratings**

Properties within or adjacent to the proposed right-of-way limits for the proposed project will be assigned a rating from 1 (no contamination anticipated) to 4 (high contamination potential). A second factor will evaluate the potential impacts from construction. This information will be documented in the Contamination Screening Evaluation that will include impacted properties (based on the above rating), regulatory status of sites, nature of potential contamination and potential mitigation techniques associated with the contaminated sites. This evaluation will also identify those sites that merit further evaluation to determine the existence of site contamination prior to purchase of right-of-way.

### **16.5 Avoidance, Minimization and Mitigation Plans**

Hazardous and Contaminated Materials will be avoided by identifying potential hazardous and contaminated materials listed the EDR database on project mapping. Minimization of impacts will be made and mitigation plans will be developed where impacts are unavoidable.

### **16.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

### **16.7 Deliverables**

- Draft and Final Phase I investigation report of the UNC Charlotte alignment.
- Text for Draft and Final updated Chapter 16.0, Hazardous and Contaminated Materials (Draft and Final EIS).

## **17.0 UTILITIES**

### **17.1 Overview**

The project has the potential to impact existing electrical power, water and sewer facilities, storm drainage systems, natural gas lines and telecommunications transmission lines. As such, the impact to these systems will be assessed during preliminary engineering and described in the Draft and Final EISs.

### **17.2 Study Area**

The study area for utilities will be the construction limits of the Light Rail Alternative as impacts would be site-specific.

### **17.3 Data Needs**

Data for this chapter of the EIS will be obtained from the utility surveys being conducted by the engineering team.



## **17.4 Draft EIS Impact Assessment Methods**

Impact assessment to utilities will be limited to the results of the utility surveys being performed by the engineering team and the capital costs associated with the relocation of the utilities identified to be relocated as a direct result of the Light Rail Alternative. Utility owners will be identified and individual meetings will be held with each individual utility in order to gather information on existing facilities and any planned improvements. A utility corridor will be identified to evaluate the potential utility relocation scenarios and to identify a “utility corridor” for the Project. This will include the adjustments to the proposed alignment to minimize utility conflicts, consolidating utilities into designated corridors, and a preliminary determination of easements required for potential utility relocations. Any waterline and sanitary sewer lines that will be relocated will be identified in a “red-line” set of drawings.

Impacts to existing storm drainage systems will be assessed by during 15 percent design by reviewing previous work performed as part of conceptual engineering; obtaining data from Charlotte Mecklenburg Stormwater Services; delineating existing drainage outfalls drainage areas and determining the impacted stream lengths. A letter report of stormwater findings and a map delineating drainage outfalls will be prepared for submittal to the City and for coordination with the City Storm Water Services Division of EPM. The results of this interagency coordination will be documented in the Draft EIS.

## **17.5 Avoidance, Minimization and Mitigation Plans**

Avoidance and minimization measures will be employed to reduce the impacts and costs associated with relocation utilities both above and below ground. Where feasible the design team will minimize possible utility conflicts.

## **17.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. Composite utility relocation plans will be developed during 30 percent preliminary engineering. The Final EIS will provide any additional details developed in the composite utility relocation plans.

Storm Water impacts will be updated in the Final EIS based on the 30 percent design, which will include: a field review of the Project; a layout of the proposed drainage system on 30 percent civil and roadways plans; the delineation of drainage areas and the preparation of drainage area maps; performance of initial drainage calculations; the refinement of the drainage system layout; and, the initial Drainage Report. These efforts will be coordinated with the City’s Storm Water Services Division of EPM.

## **17.7 Deliverables**

- Text for Draft and Final Chapter 17.0, Utilities (Draft and Final EIS).

# **18.0 SAFETY AND SECURITY**

## **18.1 Overview**

The Safety and Security Chapter of the EIS will examine the safety and security measures that will be employed by CATS to provide for the safe and secure operation of Light Rail Alternative.

## **18.2 Study Area**

The study area for the safety and security assessment is limited to the Light Rail Alternative alignment and stations.

## **18.3 Data Needs**

Data needs will include the identification of safety and security measures that CATS will employ to provide for safe and secure operations of the proposed Light Rail. The City will provide all data for this chapter, including a completed Safety & Security Management Plan.

## **18.4 Draft EIS Impact Assessment Methods**

Assessment methods to determine the significance of impacts on safety and security will include:

- Review of the Safety & Security Management Plan; and,
- Evaluation of the Safety & Security Management Plan (SSMP) based on FTA guidance for preparing the SSMP.

## **18.5 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

## **18.6 Deliverables**

- Text for Draft and Final Chapter 18.0, Safety and Security (Draft and Final EIS).

# **19.0 DISPLACEMENTS AND RELOCATIONS**

## **19.1 Overview**

Displacement results from right-of-way acquisition that requires permanent removal or relocation of existing land uses. The LYNX BLE Light Rail Alternative will involve the purchase of partial and/or whole property parcels, potentially resulting in displacement of residential, commercial and/or business/industrial uses. In addition, encroachments (buildings, storage of materials, fences, etc.) and other illegal use of the existing right-of-way for business purposes may be present along the corridor. Additional areas associated with acquisition include station areas, park-and-ride lots, and ancillary facilities such as traction power substation locations and signal houses. The proposed project assumes that the existing CATS Light Rail Maintenance Facility would be used for this project. If additional maintenance facilities or storage yards are required, the scope of the EIS would be expanded to include such facilities. Particular attention will be focused on neighborhoods, community services, and environmental justice populations if such areas/uses are impacted by the project in terms of right-of-way acquisition.

Procedures and programs related to right-of-way acquisition for the Light Rail Alternative will be consistent and in accordance with applicable federal rules (the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970), state rules and regulations, and the City's updated Real Estate Management Plan (RAMP). Local sources of information will include the Mecklenburg County Tax and Property Appraiser database.

## **19.2 Study Area**

The study area for displacements and relocations is site specific and therefore, is defined as the construction limits of the project and any areas identified for construction staging.

## **19.3 Data Needs**

- City's Real Estate Management Plan (RAMP).
- Mecklenburg County Tax and Property Appraiser database.
- Confirmed list of acquisitions and displacements (including impacted on-site parking spaces if available), as identified for the Draft EIS and the Final EIS.

## **19.4 Draft EIS Impact Assessment Methods**

Tasks and activities related to displacements and relocation will be coordinated with the City of Charlotte Engineering and Property Management Department (E&PM). All information will be reviewed and confirmed by E&PM. Tasks and activities related to displacements and relocation are described below.

1. Identify potential acquisitions and relocations based on engineering drawings overlaid on current aerial photography and GIS mapping, depicting the proposed right-of-way limits for the project, including full acquisitions and partial acquisitions.
2. Conduct field reviews to verify current parcel use of affected properties.
3. Calculate residential, business/industrial and institutional displacements of the Light Rail Alternative. Determine type of business/industry or institution that will be displaced. Determine affected tax value and tax revenue loss to the County/City.
4. For full acquisitions, estimate the number of relocations of residents and employees.
5. Determine the likelihood of displaced businesses relocating within the County based on the availability of appropriate land and buildings that would be comparable in site characteristics, desirability of location and cost.
6. Determine the overall impact to the housing supply and employment in the County.
7. Assess the access impacts to businesses along the proposed right-of-way that may experience changes to vehicle access, on-site parking and pedestrian access. In such instances where access or parking is affected, appropriate mitigation measures will be identified.
8. Ensure the availability of information to affected property owners, business owners and residents for the following programs: Relocation Assistance, Relocation Moving Payments, Relocation Replacement Housing Payments or Rent Supplement. This effort will be handled entirely by E&PM.

## **19.5 Avoidance, Minimization and Mitigation Plans**

Design refinements will be recommended to the extent practicable to avoid displacements and relocations.

## **19.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

## 19.7 Deliverables

- Text for Draft and Final Chapter 19.0, Displacements and Relocations (Draft and Final EIS).

## 20.0 CONSTRUCTION IMPACTS

### 20.1 Overview

Implementation of the project will involve physical improvements within the corridor that will result in construction-related impacts. This section in the EIS will address the construction impacts and related mitigation and preventative measures that can be implemented to minimize the negative impacts of construction activities. Descriptions of the impacts associated with the construction phase of the project may include disruptive effects on the community. This section of the EIS will identify corrective measures where feasible to reduce potential community disruption.

Transportation and circulation impacts during construction are perhaps the most commonly experienced impact by the general public and will vary based on construction activities related to aerial structures or activities located at at-grade railroad crossings. These impacts occur primarily to traffic movements, on-street parking and access to adjacent properties. Disruptions to traffic flows may also occur as a result of at-grade crossing construction; light rail station construction; bridge construction; utility relocations; and, increases in truck and construction equipment near the work sites. The extent of disruptions to existing traffic will vary significantly by location and specific construction activity. Both partial and full closures of impacted roadways/intersections may occur, with varying durations.

Typical construction-related impacts associated with the Project that will be addressed in the EIS will likely include:

- Air Quality (localized), including dust from movement of dirt and diesel emissions from various construction equipment;
- Noise and Vibration related to construction activities (according to USDOT's assessment procedures);
- Water Quality impacts, including erosion control, sedimentation and turbidity reduction;
- Traffic, including maintenance of traffic and detour routing;
- Property access, including maintenance of access to businesses and residences;
- Safety, including job site safety considerations;
- Disposal of construction material;
- Utility impacts;
- Stock piling of construction material;
- Use of Borrow Areas (and mitigation measures proposed to reduce dredge and fill-related impacts); and,
- Visual impacts of construction.

Mitigation measures that may be identified could potentially range from simple techniques of short duration (e.g., watering to reduce dust) to longer term and more complex measures (e.g., detours or temporary highway lane construction).

### 20.2 Study Area

The study area for construction impacts will be the areas within the limits of construction.

### **20.3 Data Needs**

Data for this chapter will come from each of the technical assessment areas within the Draft EIS and general information from the engineering team such as period of construction, types of needed equipment, bid packaging, etc.

### **20.4 Draft EIS Impact Assessment Methods**

For construction-related noise and vibration impacts, the USDOT has set guidelines for the construction of public mass transit projects that cover the existing noise environment; absolute noise levels during construction activities; duration of construction; and, adjacent land use. The USDOT and FTA have also set guidelines for the evaluation of impacts due to vibration resulting from mass transit projects. The construction noise and vibration impact assessment in the EIS will be in compliance with both federal agencies and local agencies where applicable.

The identification of construction staging areas is not included in the scope of services; however, a map of environmentally sensitive areas that construction should not occur in will be provided to CATS for use during final design and construction management.

The procedure to identify and document construction impacts will be as follows:

- Document all agency standards and policies now in effect related to construction activity and community disruption;
- Identify potential impacts from construction activities and estimated timeline of probable impact based on construction schedule; and,
- Evaluate the feasibility of implementing a community relations program in order to provide general construction scheduling information, coordination of construction work with adjacent business activities and assistance with the resolution of issues that may develop between local residents, motorists, the contractor and sponsoring agency.

### **20.5 Avoidance, Minimization and Mitigation Plans**

The South Corridor Light Rail Project's construction mitigation techniques and the Community Relations Program will be examined to identify effective techniques or program elements that CATS would like to repeat during the development of the LYNX BLE Project. Interviews will be conducted with STV Construction Management Team members, CATS Construction and Operating Teams, and the CATS/City Community Relations Teams in order to provide input on the best practices used during construction that CATS would like repeated for the LYNX BLE Project.

The mitigation plan will provide recommendations on the following:

- On-site notification signs identifying a contact person for the implementing agency;
- Maintenance of property access procedures;
- Maintenance of existing lanes of traffic (peak hour) on congested roadways;
- Use of erosion and sedimentation control measures to protect water quality;
- Noise control measures recognizing noise sensitive locations and hour of the day restrictions;
- Detour signing and use of warning signs and markings;
- Off peak construction times;
- Contractor sensitivity of the visual impacts of on-site storage of materials and equipment;
- Concurrent utility relocations with construction of the light rail;

- Existing bus transit rerouting where necessary based on expected disruption to existing service; and,
- A community relations program.

## **20.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

## **20.7 Deliverables**

- Text for Draft and Final new Chapter 20.0, Construction Impacts (Draft and Final EIS).

# **21.0 SECONDARY AND CUMULATIVE IMPACTS**

## **21.1 Overview**

This section will identify and summarize key secondary and cumulative impacts of the Light Rail Alternative in the project corridor and region. The No-Build and TSM alternatives will not be included in this assessment as there are not likely to be any actions that would result in secondary or cumulative impacts under these alternatives.

Secondary or indirect impacts are defined as “effects which are caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable. Secondary effects could include growth-inducing effects and other effects related to changes in the pattern of land use, population density or growth rate and related effects on air and water or other natural systems, including ecosystems” (40 CFR 1508.8).

Cumulative impacts are changes to the environment that are caused by an action in combination with other past, present and future human actions.

## **21.2 Study Area**

The study area for secondary and cumulative impacts is the project corridor.

## **21.3 Data Needs**

Much of the data for this task will have been gathered for other technical areas, such as land use and growth control strategies, demographic data, natural resource and water resource information. Specific data to for this task include:

- A list of present transportation and development projects;
- A list of “reasonably foreseeable” future transportation and development projects; These projects are planned but not under construction;
- Local land use policies and development ordinances; and,
- Available developable land (City to provide from Station Area Planning efforts).

## **21.4 Draft EIS Impact Assessment Methods**

The evaluation in the Draft EIS of the impact of Secondary and Cumulative Impacts of the Light Rail Alternative will include a systematic approach. Geographic study area boundaries will be established and data will be gathered to establish baseline trend conditions; social, economic

and ecological goals; and, growth-related issues within the study area. Local land use policies, local development incentives, available developable land, and other proposed or recently completed projects in the area. The investment climate will also be reviewed to help establish baseline conditions and trends. The aforementioned information also will be utilized to develop guidelines for determining what constitutes “reasonably foreseeable future actions.” Overlay mapping, impact matrices, and trend analyses will be the primary methods used to analyze secondary and cumulative impacts, which would be analyzed in terms of the specific resource, ecosystem, and/or human community affected.

The Draft EIS and Final EIS will include a discussion of indirect and cumulative impacts on a category-by-category basis (e.g., land use, historic resources, water quality, social, economics, wetlands, and other topics for which this discussion will be appropriate) for those areas where impacts of national, regional, or local significance are anticipated. Interagency coordination and public involvement will be utilized in determining these areas of potential secondary and/or cumulative impacts.

As part of the secondary and cumulative impacts chapter, a section will be prepared for Commitment of Resources. This sub-section will focus on two concepts: the permanent commitment of resources as compared to the benefits of the project, and the relation between expending environmental resources in the short-term and gaining productivity in the long-term. Both of these concepts will be qualitatively addressed and documented to identify issues such as improved mobility, reduced travel time, reduced congestion on the regional highway network, support for the region’s economic development and reduction in mobile source air pollutants. This section will rely on results obtained in other technical areas.

### **21.5 Avoidance, Minimization and Mitigation Plans**

Potential mitigation measures will be identified, on a programmatic scale, to address perceived secondary impacts. Mitigation measures will be recommended for each potential negative secondary impact for the Light Rail Alternative. Strategies and policies that encourage transit-supportive development will be identified as potential mitigation for negative cumulative effects.

### **21.6 Final EIS Content**

The Final EIS will incorporate any comments raised during the public and agency circulation period of the Draft EIS and will provide needed updates based on changes to the project design between the 15 and 30 percent preliminary engineering design plans. The methodology of this section will not change between the Draft and Final EIS.

### **21.7 Deliverables**

- Draft and Final new Chapter 21.0, Secondary and Cumulative Impacts (Draft and Final EIS).

## **22.0 EVALUATION OF ALTERNATIVES**

### **22.1 Overview**

CATS has developed a corridor evaluation framework as part of a set of common technical methods and guidance to be followed for the evaluation of alternatives in each of the corridors being advanced in the CATS system plan. System-wide principles were used in the development of specific measures to evaluate transportation improvement and station area alternatives as part of the corridor environmental evaluations. These local criteria are

documented in the February 2005 document entitled “*Transit Corridor Planning and Environmental Impact Statements: Regional Goals and Objectives and Corridor Evaluation Framework.*”

The FTA requires that any project seeking discretionary Section 5309 funding be evaluated using the FTA New Starts Criteria. These criteria were initially set forth in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) that established the FTA New Starts Criteria.” While the FTA New Starts Criteria were used in the development of the CATS’ Evaluation Framework, legislative and administrative changes have been made to these criteria since the document was completed. Specifically, the authorization of the current transportation bill, called Safe, Accountable, Flexible, Efficient Transportation Equity Act--A Legacy for Users (SAFETEA-LU), and the August 3<sup>rd</sup>, 2007 Notice of Proposed Rule Making to modify the Major Capital Project Rule codified in 49 CFR Part 611, have altered the FTA New Start Criteria.

The CATS’ evaluation measures listed in Table 1 of the CATS’ Evaluation Framework and in the following Table 1 need to be reviewed and any changes to FTA New Starts Criteria that might have occurred since early 2008 will need to be identified for inclusion in the Evaluation of Alternatives Chapter of the EIS. Once approved by CATS, the revised evaluation measures will be used to evaluate the No-Build, TSM, the Light Rail Alternative, the Light Rail Alternative Sugar Creek Design Option and the Light Rail Alternative 36<sup>th</sup> Street Design Option.

## **22.2 Study Area**

The study area for the Evaluation of Alternatives Chapter will be the project corridor.

## **22.3 Data Needs**

Data for the Evaluation of Alternatives Chapter will come from Chapter 1.0, Purpose and Need; travel demand forecasting model results; all EIS technical chapters for the environmental trade-off analysis; and, CATS’ most recent annual New Start Report to Congress (to be provided by CATS).

## **22.4 Evaluation Methodology**

As described in the Overview Section, Table 1 of the CATS’ Evaluation Framework document will be updated using the most up-to-date FTA regulation and guidance at the time of development. Given that a Final Rule is expected in the Fall of 2008, these activities will not take place until that time.

The Chapter will describe each of the evaluation criteria, the rating and/or ranking methods, and will document the results of the assessment by alternative. This chapter will be organized by each of the evaluation factors, including: land use, mobility, environment, financial and system integration.

## **22.5 FTA New Starts Criteria**

The Chapter will also include a section describing the FTA New Starts Criteria and the rating and evaluation process during project development, and will report FTA’s rating of the Project from the most recent FTA New Start Submittal. It will document future FTA New Starts submittals and explain the FTA approval process for advancing the project into final design and construction.



**22.6 Final EIS Content**

The Final EIS Evaluation of Alternatives Chapter will document the decision of the Metropolitan Transit Commission at the conclusion of the Draft EIS process. The content of the evaluation itself and specifically, the FTA New Starts Criteria, are not expected to change unless revisions to the FTA New Starts Criteria between the Draft and Final EIS occurs.

**22.7 Deliverables**

- Draft and Final new Chapter 22.0, Evaluation of Alternatives (Draft and Final EIS).

**TABLE 1**

**TRANSIT CORRIDOR PLANNING AND ENVIRONMENTAL IMPACT STATEMENTS CORRIDOR EIS EVALUATION MEASURES: SOURCES AND RATIONALE**

Evaluation Category & Measures	Method	Source	Rationale
<b>LAND USE</b>			
<b>Compatibility with the Surrounding Context</b> <ul style="list-style-type: none"> <li>- Land use compatibility</li> <li>- Visual and aesthetic compatibility</li> </ul>	Rate the compatibility and appropriateness of the proposed transit alignment and facilities ( <i>low, medium, high</i> ) with existing development pattern Rate the visual and aesthetic compatibility of the proposed alignment and transit facilities on the surrounding land uses ( <i>low, medium, high</i> )	Based on corridor land use analysis, Urban Design Framework.	Support local decision-making  FTA New Starts Criteria – Factor 1 Existing Land Use
<b>Transit Supportiveness of existing development</b> <ul style="list-style-type: none"> <li>- Existing development pattern consistency with TOD principles</li> </ul>	Rate transit supportiveness of existing patterns within ½-mile of station compare to adopted transit oriented principles ( <i>Low, medium, high</i> ) <ul style="list-style-type: none"> <li>• <i>Uses</i></li> <li>• <i>Intensity</i></li> <li>• <i>Form</i></li> </ul>	Based on corridor land use analysis, Transit Supportive Principles Adopted in the Charlotte Mecklenburg County GDPs, and New Starts criteria	Support local decision-making  FTA New Starts Criteria - Factor 1 Existing Land Use; Factors 3, 4 & 5 Transit Supportive Corridor Policies, Supportive Zoning Regulations Near Transit Stations, Tools to Implement Land Use Policies
<b>Serve existing activity centers</b> <ul style="list-style-type: none"> <li>- Residential Units Served</li> <li>- Office and Retail Development Served</li> <li>- Visibility and Prominence of Station</li> </ul>	Measures the existing development within the proposed station areas (½ mile of each station).  Rate each stations visibility and prominence to existing development ( <i>low, medium, high</i> )	Based on corridor land use analysis, GIS analysis, Transit Oriented Development Assessment, The Corridor Urban Design Framework	Support local decision-making  FTA New Starts Criteria – Factor 1 Existing Land Use; Factor 2 Containment of Sprawl

**TABLE 1 (CONTINUED)  
TRANSIT CORRIDOR PLANNING AND ENVIRONMENTAL IMPACT STATEMENTS  
CORRIDOR EIS EVALUATION MEASURES: SOURCES AND RATIONALE**

Evaluation Category & Measures	Method	Source	Rationale
<b>LAND USE (continued)</b>			
<p><b>Promotes transit supportive development within station areas</b></p> <ul style="list-style-type: none"> <li>• <b>Effective service area</b> <ul style="list-style-type: none"> <li>– Pedestrian Access</li> <li>– Vehicular Access</li> </ul> </li> <li>• <b>Market opportunities</b> <ul style="list-style-type: none"> <li>– TOD Opportunities</li> <li>– TOD Timing</li> </ul> </li> </ul>	<p><b>Effective service Area</b> - Defines the physical market area for TOD Development.</p> <ul style="list-style-type: none"> <li>• <b>Pedestrian Access:</b> Documents total acres of land within an 10-minute walk at 3 m.p.h. (1/2-mile)</li> <li>• <b>Vehicular Access:</b> Documents total land area within a 5-minute drive of LRT &amp; BRT and a 10-minute drive of commuter rail.</li> </ul> <p><b>Market Opportunities:</b> Provides general market overview of the transit corridor and proposed station areas for TOD Development.</p> <ul style="list-style-type: none"> <li>• <b>Vacant and Underutilized Land:</b> Documents the immediate opportunities for transit oriented development with total acres of vacant land and total acres of underutilized land defined as non-single family land uses where improved value of land is less than 40% of the total value of the property within ½ mile.</li> <li>• <b>Acres of Potential TSD:</b> Documents total land eligible for transit supportive development within ½ mile of the stations. Eligible land will include total acres of land not zoned single family, institutional, or park lands.</li> <li>• <b>TOD Opportunities:</b> An evaluation summary matrix and measurement of total acres will illustrate each district's general development potential by documenting the physical opportunities (high, medium, and low) by general land use classifications.</li> <li>• <b>TOD Timing:</b> An evaluation summary matrix and measurement of total acres will illustrate each district's general market readiness by documenting the timing of opportunities (immediate, short-term, and long-term) by general land use classifications.</li> </ul>	<p>Based on corridor land use analysis, GIS analysis, Transit Oriented Development Assessment, The Corridor Urban Design Framework; and Station Typologies.</p>	<p>Support local decision-making</p> <p>FTA New Starts Criteria - Factor 1 Existing Land Use; Factor 2 Containment of Sprawl; and, Factors 3, 4 &amp; 5 Transit Supportive Corridor Policies, Supportive Zoning Regulations Near Transit Stations, Tools to Implement Land Use Policies</p>

**TABLE 1 (CONTINUED)  
TRANSIT CORRIDOR PLANNING AND ENVIRONMENTAL IMPACT STATEMENTS  
CORRIDOR EIS EVALUATION MEASURES: SOURCES AND RATIONALE**

<b>Evaluation Category and Measure</b>	<b>Method</b>	<b>Source</b>	<b>Rationale</b>
<b>MOBILITY</b>			
<b>Total Daily Guideway Boardings</b>	2025 LRT, BRT or commuter rail boarding's	Travel forecasting model (CDOT)	FTA New Starts Criteria Differentiator
<b>New System Transit Trips</b>	(Total system daily build) – (total system daily future baseline)	Travel forecasting model CDOT)	FTA New Starts Criteria Differentiator
<b>Transportation System User Benefits – Hours</b>	FTA methodology	Travel forecasting model (CDOT)	FTA New Starts Criteria Differentiator
<b>Low Income Households Served</b>	Low income households within ½-mile of stations	U.S. Census data (Households with income below poverty level)	FTA New Starts Criteria
<b>Service Reliability</b>	Rate based on miles and percent of alternative's total alignment in dedicated (non-shared) alignment from street <i>(Low, low-medium, medium, medium-high, high)</i>	Measure off concept plans	Differentiator
<b>ENVIRONMENT</b>			
<b>Acquisitions &amp; Displacements</b>	Number of residences and businesses acquired entirely or partially because of construction	Measured off concept drawings	Measurable
<b>Noise &amp; Vibration Affected Receivers</b>	Number of receivers with projected noise and vibration levels above FTA impact thresholds.	Results of general assessment	Differentiator
<b>Local Traffic Effects</b>	Number of degraded intersections	Results of traffic analysis	Differentiator
<b>Cultural or Natural Resources Affected</b>	Number of historic and archaeological properties and parklands affected.	Based on concept plans and 4f and Section 106 assessments	Demonstration of Avoidance and/or Minimization

**TABLE 1 (CONTINUED)  
TRANSIT CORRIDOR PLANNING AND ENVIRONMENTAL IMPACT STATEMENTS  
CORRIDOR EIS EVALUATION MEASURES: SOURCES AND RATIONALE**

<b>Evaluation Category and Measure</b>	<b>Method</b>	<b>Source</b>	<b>Rationale</b>
<b>ENVIRONMENT (continued)</b>			
<b>Acquisitions &amp; Displacements</b>	Number of residences and businesses acquired entirely or partially because of construction	Measured off concept drawings	Measurable
<b>Noise &amp; Vibration Affected Receivers</b>	Number of receivers with projected noise and vibration levels above FTA impact thresholds.	Results of general assessment	Differentiator
<b>Local Traffic Effects</b>	Number of degraded intersections	Results of traffic analysis	Differentiator
<b>Cultural or Natural Resources Affected</b>	Number of historic and archaeological properties and parklands affected.	Based on concept plans and 4f and Section 106 assessments	Demonstration of Avoidance and/or Minimization
<b>Connections to Activity Centers, Special Event &amp; Cultural Sites Connected</b>	Rate based on definition and count of sites ( <i>Low, low-medium, medium, medium-high, high</i> )	Count from maps of corridor	Informational
<b>Ecosystems, Farmlands &amp; Protected/Endangered Species</b>	Number of endangered species & wildlife impacted, acres of maintained/disturbed habitat	Measured off concept plans	Possible Differentiator
<b>Water Resources Affected</b>	Number of affected floodplains or groundwater sources; linear feet of surface waters and acres of wetlands impacted	Measured off concept plans	Differentiator
<b>Hazardous Materials</b>	Number of hazardous sites affected and required mitigation efforts	Measured off concept plans	Differentiator
<b>Construction Impacts</b>	Rate based on air quality, noise, vibration, water resources, etc. impacts	Results of assessment	Differentiator
<b>Air Quality</b>	Rate based on conformity with regional plan, creation of CO hot spots & VMT reduction	Travel forecasting model & air quality modeling	Differentiator
<b>Visual &amp; Aesthetic</b>	Number of new visual elements not in character with corridor	Results of assessment	Differentiator

**TABLE 1 (CONTINUED)  
TRANSIT CORRIDOR PLANNING AND ENVIRONMENTAL IMPACT STATEMENTS  
CORRIDOR EIS EVALUATION MEASURES: SOURCES AND RATIONALE**

<b>Evaluation Category and Measure</b>	<b>Method</b>	<b>Source</b>	<b>Rationale</b>
<b>FINANCIAL</b>			
<b>Operating &amp; Maintenance Costs</b>	Incremental O&M \$	O&M Costing Methodology	Differentiator
<b>Capital Costs</b>	Incremental Capital \$	Capital Costing Methodology	Differentiator
<b>Transportation System User Benefits</b>	Incremental users benefits relative to the Future Baseline (hours of travel time saving) computed by the application of the SUMMIT program within the CDOT regional travel forecasting model	FTA New Starts Criteria Technical Methods	FTA New Starts Criteria  Differentiator
<b>SYSTEM INTEGRATION / CONSISTENCY WITH ADOPTED SYSTEM PLAN</b>			
<b>Synergy with Other Corridors</b>	Rate based on passenger through service and connections ( <i>Low, low-medium, medium, medium-high, high</i> )	Travel forecasting model	Differentiator
<b>Operating Efficiency</b>	Rate based on ability to operate through services ( <i>Low, low-medium, medium, medium-high, high</i> )	Service plans	Differentiator
<b>Balance Use of System Capacity</b>	Rate based on use of Center City street and rail capacities ( <i>Low, low-medium, medium, medium-high, high</i> )	Service plans	Differentiator

## **23.0 PUBLIC INVOLVEMENT AND AGENCY COORDINATION**

This chapter will document the public and agency involvement held throughout the Draft EIS process. CATS will have the primary responsibility and take the lead for all public involvement meetings. Therefore, this chapter will summarize the documentation provided by CATS. Early and continual coordination with local, state and federal agencies will occur throughout the Draft EIS process. Copies of letters received from agencies with jurisdiction of the project will be copied by CATS and provided the STV/Ralph Whitehead team for inclusion in the EIS administrative record and the document control files. Meeting minutes for each environmental resource or regulatory agency coordination meetings in which the Consultant participates will be maintained in a summary format. These items will serve as the basis for the Draft EIS chapter that will list out the dates of all agency coordination meetings and summarize the input obtained through the coordination activities.

The Final EIS document will provide documentation of all comments received at the public hearing and during the circulation period of the Draft EIS. A chapter called "Draft EIS Comments and Responses" will be added to the Final EIS and will detail each comment and provide a response on how the comment was addressed in the Final EIS. Copies of correspondence letters and communications will be provided in an Appendix.

### **23.1 Data Needs**

The location, date, attendance level and notes from all neighborhood, public, station area planning, agency, and Growth Strategy Steering Team to be provided to the Consultant Team by CATS.

### **23.2 Deliverables**

- Draft and Final new Chapter 23.0, Public & Agency Involvement (Draft and Final EIS).
- Draft and Final new Chapter 24.0, Draft EIS Comments and Responses (Final EIS).