

APPENDIX H – LEGAL AND REGULATORY CONTEXTS/METHODOLOGIES

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The legal and regulatory context and methodologies for examination of potential impacts to important human and natural resources as a result of the proposed project is as follows:

CHAPTER 4.0: LAND USE, PUBLIC POLICY AND ZONING

Legal and Regulatory Context

The CEQ regulations (40 CFR §§ 1508.7 and 1508.8) define the impacts and effects that must be addressed and considered by Federal agencies in satisfying the requirements of the National Environmental Policy Act (NEPA) process. Such impacts and effects include direct, indirect, and cumulative impacts.

Section 4.1.5 includes a discussion of planning in the local context, and includes a description of municipal plans and policies that guide development in the corridor. Section 4.1.5 also discusses local zoning regulations and districts that provide the framework in which to promote and implement transit-supportive development.

Methodology

Study Area

The study area for the land use analysis extends ½-mile from each side of the proposed alignment and is illustrated in Figure 4-1 (see Chapter 4.0: Land Use, Public Policy and Zoning).

Existing Conditions and Future Land Use Goals

Information on existing land use was obtained from the City of Charlotte and Charlotte-Mecklenburg Planning Department, Charlotte Area Transit System (CATS) and the Charlotte Department of Transportation (CDOT). In addition, several plans that are intended to guide land use were reviewed and are described in this chapter. The following plans and data were obtained and reviewed to describe existing land use and land use goals in and affecting the study area.

- Existing land use data and zoning GIS layers (Charlotte-Mecklenburg County GIS 2008).
 - Landuse Buffer.shp
 - 500ft Parcel Clip Landuse File.shp
 - Vacant Parcels 11-12-08.shp
- Charlotte-Mecklenburg Planning Commission. (1998). *2025 Integrated Transit/Land Use Plan*.
- Charlotte-Mecklenburg Planning Department. (2008). *Center, Corridors and Wedges Growth Framework Draft 2008*.
- Metropolitan Transit Commission. (2006). *2030 Transit Corridor System Plan*.
- Charlotte Area Transit System. (2005). *Charlotte Northeast Corridor TOD Station Analysis*.
- Charlotte Area Transit System. (2009). *Northeast LRT Corridor FY 2011 New Starts Submittal*.
- Charlotte Area Transit System. (2009). *Blue Line Extension Design Criteria, Chapter 3, Urban Design Framework*.
- University City Partners. (2007). *University City Area Plan*.
- Charlotte-Mecklenburg Planning Commission. (2000). *Northeast Area Plan*.
- Charlotte-Mecklenburg Planning Commission. (1996). *Northeast District Plan*.
- Charlotte-Mecklenburg Planning Commission. (1995). *North Charlotte, An Historic Community*.
- Metropolitan Studies Group. (2008). *Charlotte Neighborhood Quality of Life Study*.
- STV/Ralph Whitehead Associates Field Surveys/Land Use Inventory (September/October 2008).

CHAPTER 5.0: SOCIO-ECONOMIC CONDITIONS

Legal and Regulatory Context

A Congressional Declaration of the National Environmental Policy Act (42 USC §§ 4331) requires a measurement of the influences of man's activity on socio-economic conditions. In addition, the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU) requires

documentation of the degree to which a transit project would impact local economic development as part of the Federal Transit Administration (FTA) National Environmental Policy Act (NEPA) review process.

Methodology

Study Area

An examination of socio-economic effects requires a multi-scale analysis that considers the relationships among the regional area and the project corridor. Thus socio-economic impacts of the proposed project are evaluated at three scales, namely: at the regional level, at a smaller county/city level, and at a more refined corridor/site specific level. This multi-scale analysis provides a summary of the anticipated socio-economic impacts of the project alternatives with regards to a range of considerations, from regional good and services to changes in the local (i.e., city) tax revenue.

The study area for the regional-scale socio-economic evaluation is defined as the Charlotte-Gastonia-Concord, North Carolina-South Carolina Metropolitan Statistical Area (MSA) that includes five counties in North Carolina, namely Anson, Cabarrus, Gaston, Mecklenburg, and Union; and York County in South Carolina. MSAs are large areas of adjacent communities that have a high degree of social and economic integration.

The study area for the county/city level of evaluation is defined based on the census tracts within the boundaries of the project corridor. Census tracts are contained within the political boundaries of Mecklenburg County and provide a useful tool to describe the demographics (e.g., population) and existing economic conditions (e.g., income, employment) within the county and project corridor.

With regards to the site-specific level of analysis, socio-economic impacts are evaluated for a study area of ½-mile around the proposed light rail stations. FTA considers ½-mile to be a safe and convenient distance to walk to public transit. Because of the accessibility and walkability, transit stations often become focused development areas that are expected to experience economic effects as a result of a transit project. Projected station-area socio-economic data was derived from data from Traffic Analysis Zones (TAZ). TAZs are comprised of census tracts.

Information on existing land use was obtained from the City of Charlotte and Charlotte-Mecklenburg Planning Department (Planning), Charlotte Area Transit System (CATS) and the Charlotte Department of Transportation (CDOT). In addition, several plans that are intended to guide land use were reviewed and are described in Chapter 4.0: Land Use, Zoning and Public Policy.

Additional information, such as income, ethnicity, age and poverty levels is used to describe the study area and specific constituent populations. Information on current and projected housing is also presented. Information presented in this analysis was obtained from the U.S. Census Bureau (2000 data); data compiled by CATS and the City of Charlotte for the Fiscal Year 2011 New Starts template workbook, including the Land Use template; data from the LYNX Blue Line Extension, Project Cost Estimate Based on 15% *Preliminary Engineering Design Plans* (September 11, 2009); data from *Operations and Maintenance Quantities and Costs for Light Rail Transit* (September 30, 2009); and data from *Operations and Maintenance Quantities and Costs for Bus* (September 30, 2009).

Impacts

The socio-economic impacts associated with construction, operation and maintenance of the proposed project are measured using regional multipliers from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA). The multipliers are derived from the Regional Input-Output Modeling System (RIMS II), which account for industry relationships within regions and is a useful tool for evaluating socio-economic impacts. RIMS II is widely used for socio-economic impact analyses and is based on an input-output (I-O) table framework, meaning that for each industry, an I-O table shows the inputs purchased associated with the outputs sold. BEA produces tables at the national level (1997 benchmark) to show the I-O structure of approximately 500 industries in the U.S. Regional data (2006 benchmark) is then used to adjust the national I-O table to reflect the structure and trading patterns of a particular region. Specific RIMS II regional multipliers were developed by BEA for the Charlotte-Gastonia-Concord, NC-SC MSA and were used in this analysis.

To determine the economic input of a proposed project, one must first consider the funding sources. Generally, funds that originate at the local level (except for sales tax funds) would be spent in the local economy regardless of the project (i.e. if the Light Rail Alternative were not built, the funds would be used to fund or build another transit-related project). Therefore, only the inflow of funds beyond the local level (i.e. those at the state and federal levels, would be considered new expenditures that would contribute to new economic output, jobs creation and income).

The types of impacts considered included population, housing and employment; economic output, jobs creation, and income; special economic activities; and government finance and tax sources. The potential for negative impacts is expressed quantitatively or with the following qualitative terms:

- No impact: This category applies if the alternative would not be expected to result in a negative impact to socio-economic conditions. Positive impacts that may also occur, such as increases in economic output or job creation, would also fall within this category.
- Potential impact: This category applies if the alternative may result in a minor negative impact to socio-economic conditions. Negative impacts include decreases in population, housing and employment, as well as no increases in job creation or special economic activities. Loss in existing tax revenue that may or may not require mitigation, depending on the overall impact to the economy would also be categorized as a potential impact.
- Potentially significant impact: This category applies if the alternative would likely result in substantial changes to a specific industry or to a business that has substantial economic value.

CHAPTER 6.0: NEIGHBORHOODS, COMMUNITY SERVICES AND ENVIRONMENTAL JUSTICE

Legal and Regulatory Context

Title VI of the Civil Rights Act of 1964 requires that Federal agencies ensure that no person is excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving Federal assistance on the basis of race, color or national origin.

There are no local, state, or federal regulations that specifically pertain to community services and facilities. Chapter 23.0 of the Design Criteria for the proposed light rail project provides safety and security guidelines to coordinate community service provisions. Mutual agreements with the City of Charlotte and Mecklenburg County provide guidance for the proposed project and for addressing potential adverse effects on community services and facilities.

Federal laws and regulations specifically require the evaluation of the effects of transportation actions on special populations. Executive Order (EO) 12898 requires that “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” The overall intent of the Order is to prevent projects and programs from placing disproportionate negative effects on minority and low-income communities and to ensure these communities have ample opportunity to participate in project development.

The federal guidance for evaluating environmental justice issues is found in *Guidance for Federal Agencies on Key Terms in Executive Order 12898*, which was developed by the Interagency Working Group on Environmental Justice, August 1995. In addition, both the U.S. Department of Transportation and the U.S. Environmental Protection Agency have developed guidelines for addressing environmental justice concerns.

Methodology

Study Area

The study area for the assessment of neighborhoods includes all neighborhood statistical areas (NSAs) located adjacent to the proposed project corridor. Existing community facilities within ½-mile of the proposed project corridor were identified. The environmental justice study area is defined as any Census Tract partially or wholly within ½-mile of the proposed alignments for the LYNX BLE. The 2000 U.S.

Census Tract boundaries were used.

Existing Conditions

Information on existing neighborhoods, community facilities and environmental justice populations was obtained from the City of Charlotte, Charlotte-Mecklenburg County and the United States Census Bureau. The following plans and data were obtained and reviewed as part of the assessment for this chapter.

- Existing Geographic Information System (GIS) layers (Charlotte-Mecklenburg County GIS 2008).
 - Neighborhoods : SDE_SDE_NDEV_NSA_V.shp
 - EJ – cenbg00.shp
 - Community Facilities – Field observations and Mecklenburg County Facilities shapefiles 2000
- 2000 Census demographic data
- Metropolitan Studies Group University of North Carolina at Charlotte. (2008). *Charlotte Neighborhood Quality of Life Study 2008*.
- Community issues and concerns gathered through public involvement.
- STV/Ralph Whitehead Associates field surveys (September/October 2008).

Impact Assessment

The assessment of neighborhoods, community services and special populations includes an evaluation of the effects of the proposed project on the cohesiveness of residential areas and the neighborhood setting in general. Issues that are important to neighborhoods (access, neighborhood travel patterns, loss of parking, overflow parking from stations, relocation, separation, isolation, noise, vibration and aesthetics) were identified. The chapter evaluates the direct impacts that would result from the proposed project on these communities and services and the effect that it would potentially have on their quality of life.

Effects on neighborhoods and community facilities were evaluated and the types of impacts assessed are as follows:

- Travel patterns and accessibility
- Acquisitions and displacements
- Potential noise and vibration effects
- Visual and aesthetic impacts
- Disruption of community cohesion and the physical division of a neighborhood
- Disruption of community facilities and services
- Environmental Justice

The study area for the Environmental Justice impact evaluations is defined as any Census Tract partially or wholly within ½-mile of the proposed Light Rail Alternative. Data was 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) and was aggregated to the Census Tract level for presentation within this Draft EIS. The entire county was selected as the appropriate comparison tool because of the potential regional influence of this proposed project and because it best represents the regional project area.

The U.S. Department of Transportation Order (5610.2) on Environmental Justice provides clear definitions of the four minority groups addressed by Executive Order 12898. These groups are:

- **Black** – a person having origins in any of the black racial groups of Africa;
- **Hispanic** – a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race;
- **Asian American** – a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands; and,
- **American Indian and Alaskan Native** – a person having origins in any of the original people of North America and who maintain cultural identification through tribal affiliation or community recognition.

Those who considered themselves a combination of two or more races involving any of the aforementioned groups were also classified as minority for this study. In identifying study areas with minority residents, the total percentage of minority residents was estimated by adding together all residents who are any of those racial groups. Because Hispanic residents may be of any race, people who characterized themselves as White, Black, Asian, and Other in the 2000 Census may be non-Hispanic or Hispanic. To determine the total number of minority residents in each block group, the number of Black, Asian, Other, and Hispanic Whites were tallied. For this Draft EIS, a block group is considered a minority community when the percentage of minorities within it exceeds 49 percent, and low-income is defined as any Census Tract with a median income at or below 80 percent of the median household income for Mecklenburg County as a whole.

After identifying the minority and low-income communities, the next step in this environmental justice assessment was to determine the potential for environmental benefits and disproportionate or adverse impacts of the alternatives on minority and low-income neighborhoods. The impact assessment results from each of the major technical areas of the Draft EIS were analyzed to determine whether significant impacts would disproportionately occur mostly within communities of concern.

In many cases, details on specific impacts, such as land use changes, noise and vibration effects, and traffic access impacts are presented in other chapters of the Draft EIS. In this chapter, overall impacts to the neighborhoods, community services, and special populations within the proposed project corridor are assessed. The potential for impacts is expressed quantitatively or with the following qualitative terms:

- **No impact:** This category applies if the alternative is not expected to result in impacts on existing conditions. Positive impacts, such as improved access to neighborhoods and community facilities, may also occur and are represented as no impact. Also included in this category are impacts to individual residential properties that would not result in an impact to the collective neighborhood.
- **Potential impact:** This category applies if the alternative may result in a minimal or moderate impact. Minimal impacts include changes from the existing conditions that typically would not need mitigation; moderate impacts include changes from existing conditions that could be addressed through mitigation. For neighborhoods and community facilities, minimal impacts include proximity impacts that do not alter the primary use of the resource. For example, the introduction of a new visual element in an urban setting where similar visual elements are present, or the introduction of increased noise and vibration in areas with high noise and vibration levels, like active transportation corridors. Moderate noise and vibration levels are also classified as a potential impact. In addition, minor acquisitions that would not cause displacements or interfere with the functioning of a property are considered potential impacts.
- **Potentially significant impact:** This category applies if the alternative would likely result in substantial changes that represent an “adverse impact” to the activities relating to neighborhoods and community facilities, or to a community of concern. In some cases the impacts might not be fully addressed through the proposed mitigation. Significant impacts could include severe noise or visual impacts to several properties within a neighborhood, as well as acquiring property that would result in multiple displacements.

Only the direct impacts of the alternatives are presented in this chapter of the Draft EIS. Temporary impacts related to the construction of the proposed project are discussed in Chapter 18.0: Construction Impacts. The potential neighborhood impacts stemming from the secondary station area development called for in the station area concept plans are discussed in Chapter 19.0: Secondary and Cumulative Effects Analysis. Parks and recreation facilities, natural resources and historic and cultural resources are community features that are addressed in detail in other chapters of this Draft EIS, specifically, Chapter 9.0, Chapter 11.0 and Chapter 8.0, respectively. In addition, impacts to the transportation network are analyzed in Chapter 3.0: Transportation and a detailed list of property acquisitions and potential displacements is included in Chapter 17.0: Acquisitions and Displacements. The safety and security measures related to the development and operation of the proposed project are included in Chapter 16.0: Safety and Security.

CHAPTER 7.0: VISUAL AND AESTHETIC CONSIDERATIONS

Legal and Regulatory Context

The National Environmental Policy Act (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 Environmental Impact Statement (EIS) in determining the effects of a transportation project. The aesthetic quality of a community is comprised of visual resources, or the physical features that make up its visible landscape.

The following publications were used for guidance in conducting analyses related to visual and aesthetic conditions and impacts of the proposed project: Federal Highway Administration (FHWA), “Guidance for Preparing and Processing Environmental and Section 4(f) Documents” (Technical Advisory T 6640.8A, 1987); and, FHWA, “Esthetics and Visual Quality Guidance Information” (August 1986).

Methodology

The study area for visual and aesthetic impacts generally extends 200 feet on either side of the proposed alignment. In areas where grade separations would occur and in station areas, the study area extends to 1,000 feet on either side of the alignment in order to examine impacts from a broader viewshed.

The following steps were taken to define and analyze visual and aesthetic issues.

- Review of local plans and ordinances pertinent to visual and aesthetic considerations related to planning for, and constructing, transportation projects.
- Identification of project viewsheds and inventory of visual features in the study area, including landforms, manmade development, water features, and vegetation.
- Preparation of a description of the existing visual character of the study area.
- Description of the viewer groups in the study area, including people who would view the proposed project and people who would have a view from the proposed project elements.
- Review of public input gained from the station area planning process. No concerns have been expressed to-date. Additional station planning activities will take place in during final design.
- Review of the *CATS Design Criteria, Chapter 3, Blue Line Extension Urban Design Framework Treatment Matrix, (UDF)* (September 2009) as it pertains to visual impacts and mitigation techniques.
- Review of CATS Blue Line Extension Preliminary Engineering 15 percent Design Plans (January 6 and 20, 2009).
- Review of CATS Blue Line Extension Preliminary Engineering 30 percent Conceptual Design Map (June 2009 and updated December 2009).
- Review of renderings and station site plans to identify visually sensitive locations along the project corridor. A preparation of descriptions to detail how the proposed project may change these views from the visually sensitive locations, particularly at station sites and bridge structures.

The following classifications were used to determine the significance of potential visual impacts:

- **No Impact:** This category applies to conditions under which no physical changes are expected to result. The proposed project would be located in areas that do not exhibit a defined visual character, or the proposed project would be compatible with the visual character of the surrounding area.
- **Potential Impact:** A potential impact could occur if the proposed project involves elements that have a different scale, color, location, or orientation from surrounding structures, or the proposed project is located within an historic district, adjacent to an historic structure, or adjacent to a major public building that is designed as a focal point (e.g., City Hall).
- **Potentially Significant Impact:** A potentially significant impact could occur if the proposed project is out of scale in an area with a recognized visual character that is perceived by the community as an asset, or the proposed project would disrupt important views (e.g., natural areas, scenic areas or significant man-made structures).

CHAPTER 8.0: CULTURAL RESOURCES

Legal and Regulatory Context

The National Historic Preservation Act (NHPA) of 1966, as amended, is the primary federal statute that addresses the management of cultural resources. It establishes federal policy on historic preservation and provides the framework by which the nation's historic preservation program has been developed. The provision of the NHPA most applicable to the current project is Section 106 of the NHPA of 1966, as amended (16 U.S.C. § 470f), which protects properties that are listed or determined eligible for inclusion in the National Register of Historic Places. Section 106 requires that prior to conducting activities classified as federal undertakings, the effects of undertakings on historic properties must be taken into account and comment from the public, consulting parties, the SHPO, and the Advisory Council on Historic Preservation allowed.

The requirements of Section 106 are implemented under Title 36, Section 800 of the *Code of Federal Regulations* (36 CFR 800), "Protection of Historic Properties." Section 106 Guidance was revised by the Council and published in the *Federal Register* 65 Federal Regulations (FR) 77698-77739 on December 12, 2000. The new guidance became effective on January 11, 2001. In addition, Section 4(f) of the Department of Transportation Act of 1966, as amended (49 U.S.C. § 303) protects historic and cultural resources from any action for which there is at least one prudent and feasible alternative.

Methodology

Archaeological Resources

Study Area

The study area for archaeological resources was the APE and was determined in consultation with the SHPO. The APE for archaeology was the limits of construction activities.

Existing Conditions

To determine the existing conditions within the APE for archaeology, an archaeological identification survey was conducted. The purpose of the survey was to determine if archaeological resources that are listed in, eligible for or potentially eligible for the National Register were located within the APE.

Historic Resources

Study Area

The study area for historic architectural resources was the APE for which the project could potentially impact these resources. The APE was determined in consultation with the SHPO. The APE included all areas within which the project may cause changes to the character or use of historic properties, directly or indirectly. For historic architectural resources, the APE was defined as approximately 250 feet on either side of the proposed centerline of the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option.

Existing Conditions

A Phase II level historic architectural resources survey was conducted in conjunction with this Draft Environmental Impact Statement (EIS). The survey meets the guidelines for architectural surveys established by the North Carolina Historic Preservation Office and the North Carolina Department of Transportation (October 2003). The Phase II architectural survey methodology consisted of both historical research and fieldwork within the APE to identify all properties that are listed, or potentially eligible, for listing in the National Register. The properties considered are defined as those resources having at least one of the following designations:

- listed in the National Register;
- listed in the North Carolina Study list;
- listed on the roster of resources with preliminary determinations of eligibility by the SHPO;
- listed as a local landmark by the Charlotte-Mecklenburg Historic Landmarks Commission; and/or,
- listed as a local historic district by the Charlotte-Mecklenburg Historic District Commission.

In addition, all properties 50 years of age or greater were identified and evaluated to determine the potential eligibility of the resource for listing in the National Register. The architectural survey files at the Charlotte-Mecklenburg Historic Landmarks Commission and the Charlotte-Mecklenburg Planning Department in Charlotte and the SHPO in Raleigh were researched. Local historians, property owners, planners, and historic preservation specialists were also contacted.

Fieldwork, conducted during October and November 2008, consisted of an architectural survey and site inspections of selected properties and neighborhoods that warranted intensive analysis within the APE. All residential, commercial, and industrial historic districts, as well as individual buildings, were examined. Potential historic properties identified during the research and fieldwork phase were evaluated against the Section 106 criteria for eligibility for listing in the National Register (36 CFR 60.4.), which are defined as follows:

“The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- that are associated with events that have made a significant contribution to the broad patterns of our history (Criterion A); or
- that are associated with the lives of persons significant in our past (Criterion B); or
- that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguished entity whose components may lack individual distinction (Criterion C); or,
- that have yielded, or may be likely to yield, information important in prehistory or history (Criterion D).”

Impact Assessment

In accordance with Section 106 of the National Historic Preservation Act, impacts were assessed by applying the following criteria which are defined in 36 CFR 800.5:

- No Effect: There would be No Effect, either adverse or beneficial, on historic properties.
- No Adverse Effect: There would be an effect, but it has been determined that the effect would not compromise those characteristics that qualify the resource for listing on the National Register.
- Adverse Effect: There would be an effect that may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association. Specifically, an adverse effect would occur if there is: physical destruction or damage; alteration of a property; removal of a property from its physical location; change of the character of a property's use or of physical features within the property's setting that contribute to its historic significance; introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features; neglect of a property that causes its deterioration; and, transfer, lease, or sale out of Federal control without adequate preservation restrictions.

CHAPTER 9.0: PARKLANDS

Legal and Regulatory Context

Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966, as amended, protects historic 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 use includes all possible planning to minimize harm to these resources. Section 4(f) applies to historic sites regardless of ownership, but only to publicly-owned parks, recreation areas and refuges.

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), legislation established in 2005, authorizes the federal surface transportation programs for highways, highway safety, and transit for the five-year period 2005-2009. SAFETEA-LU also revises Section 4(f) for the first time since 1966. The legislation amends both Title 49 U.S.C. Section 303 and Title 23 U.S.C.

Section 138 simplifying the process and allowing for the approval of projects that would have only de minimis impacts on those lands identified during the Section 4(f) analysis. This new provision allows USDOT agencies to make a de minimis impact finding in situations where impacts to Section 4(f) resources would be minimal. This new provision provides the USDOT, instead of the U.S. Department of Interior, with the ability to determine if a transportation use of a Section 4(f) property results in a de minimis impact. If so, then an analysis of avoidance alternatives would not be required and the Section 4(f) evaluation process would be finalized.

The U.S. Land and Water Conservation Fund Act of 1965 established a funding source for federal acquisition of recreational lands, wildlife and waterfowl refuges and other similar resources. The Act also establishes a funding source for matching grants to state and local governments for recreation planning, acquisition and development. Section 6(f) of the Act contains provisions to protect and maintain the quality of lands purchased using these funds, preventing these resources from being converted to land uses other than public outdoor recreational use.

Methodology

Study Area

The study area for the public parklands evaluation was defined as the area located within 1,000 feet on either side of the proposed Light Rail Alternative and its design options. Information on park and recreation facilities was obtained through field surveys conducted in September and October 2009, the City of Charlotte geographic information system (GIS), Mecklenburg County GIS, the Mecklenburg County Park and Recreation (MCPR) web site and in coordination with MCPR. The study area is comprised of a combination of urban, suburban, and natural settings. Urban settings are those which are part of a high density multi-use land use, whereas suburban settings are typically comprised of residential areas outside of the urban core. Natural settings can be found within urban and suburban settings in Charlotte and are typically comprised of wooded areas, water features (such as creeks and ponds), and areas with limited amounts or impervious surface. Many of the public parklands within the study area exhibit both urban/suburban and natural characteristics.

Impacts

Impacts to park and recreation facilities were determined based on the proximity of the identified resources to the proposed Project. The types of impacts considered included: real estate acquisitions; easements; visual impacts; noise and vibration impacts; and changing access to and from park resources. The potential for negative impacts is expressed quantitatively or with the following qualitative terms:

- No impact: This category applies if the alternative is not expected to result in a negative impact to park or recreation facilities. Positive impacts, such as improved access to park facilities, may also occur and would fall within this category.
- Potential impact: This category applies if the alternative may result in an impact, however, the impact is not considered significant. Potential impacts are changes from the existing condition that may or may not need mitigation, depending on the context of the park and intensity of the impact. Potential impacts could include modest proximity impacts (such as visual or noise) on a passive park.
- Potentially significant impact: This category applies if the alternative would likely result in substantial changes that represent an “adverse impact” to the activities relating to the features and attributes of a resource. In some cases the impacts might not be fully addressed through the proposed mitigation. Significant impacts could include severe noise or visual impacts that interfere with the properties that make the resource significant, as well as acquiring property from developed part of a park. Demolition of the resource due to a full property acquisition would also be considered a significant impact.

CHAPTER 10.0: NATURAL RESOURCES

Legal and Regulatory Context

The Farmland Protection Policy Act (FPPA) of 1981 (7 CFR 658) requires all federal agencies to consider the impact of land acquisition and construction activities on prime, unique, statewide and locally important

farmland soils, as defined by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (Public Law 97-98, Subtitle 1, Section 1540). The Federal Endangered Species Act (ESA) of 1973 (16 USC 1531 et. seq.), as amended, is the federal regulatory tool that serves to administer permits, implement recovery plans and monitor listed endangered and threatened species. The U.S. Fish & Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) administer the ESA. North Carolina protects locally or regionally rare species in addition to federally listed species. Protection for plants and animals in North Carolina is recognized under two separate laws. Animals are currently addressed by the North Carolina Endangered Species Act administered by the North Carolina Wildlife Resources Commission. Endangered, threatened and rare plants are addressed in the North Carolina Plant Protection and Conservation Act administered by the Plant Conservation Program in the North Carolina Department of Agriculture.

Methodology

Definitions of area descriptions used in this chapter are as follows:

- study area denotes the area bounded by the proposed construction limits and/or right-of-way limits and is the area studied for potential impacts; and,
- project corridor refers to the larger geographic description of the project location.

Background research on soils, protected species and other area features was conducted prior to field investigations. Sources consulted include the following:

- U.S. Geological Service (USGS) 7.5-minute quadrangle maps (Charlotte East (1991), Derita (1993), and Harrisburg (1993)).
- U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory Map (Charlotte East, Derita and Harrisburg).
- U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) (now known as Natural Resources Conservation Service (NRCS)) Soil Survey of Mecklenburg County, North Carolina (1980).
- USDA NRCS Web Soil Survey 2.2 (2008).
- Charlotte-Mecklenburg Property Ownership and Land Records Information System (POLARIS).
- Parsons Transportation Group, *Northeast Corridor Light Rail Project Conceptual Engineering/Environmental Impact Statement CE/EIS (2006)*.

Information concerning the occurrence of federal and state protected species in the study area was gathered from the following sources:

- North Carolina Natural Heritage Program website list of Mecklenburg County Endangered Species, Threatened Species, and Federal Species of Concern (Accessed September and December, 2008.)
- USFWS website of Mecklenburg County Endangered Species, Threatened Species, and Federal Species of Concern (Accessed September and December, 2008.)
- Habitat Assessment and Restoration Program, Inc., *A Threatened and Endangered Species Survey of the Proposed Right-of-Way and Station Sites for the Northeast Corridor Light Rail Project (2007)*.

Field surveys were conducted along the proposed Light Rail Alternative corridor by STV/RWA scientists on multiple dates between September 2, 2008 and December 5, 2008. Additional field surveys were conducted along the railroad right-of-way portion of the alignment on February 9, February 11, and February 13, 2009. Additional field surveys for areas added to the project were conducted on June 6, July 21 and 28, October 1 and November 5, 2009. The field investigators walked the following locations: the proposed Light Rail Alternative right-of-way, which measures approximately 200 feet wide; the proposed station locations; the proposed park-and-ride facility locations; and, the area encompassing the Light Rail Alternative – Sugar Creek Design Option. Stream crossings were examined and plant communities and their associated wildlife were identified and recorded. Wildlife identification involved using one or more of the following observation techniques: active searching, visual observations and identifying by characteristic signs of wildlife sounds, scat, remains, tracks and burrows.

Previous field surveys, findings of which are incorporated herein, were conducted by Parsons Transportation Group scientists September 19-23, 2005. The exceptions to this were the areas within the railroad right-of-way, the University of North Carolina at Charlotte (UNC Charlotte) campus portion and the areas added to the project in 2009. Additional field surveys were conducted by Habitat Assessment and Restoration Program (HARP) scientists during the last week of September and first week of October, 2007. The exceptions to this were the areas at the proposed University City Blvd. Station park-and-ride lot, the proposed Mallard Creek Church Station park-and-ride lot and the areas added to the project in 2009.

CHAPTER 11.0: WATER RESOURCES

Legal and Regulatory Context

Jurisdictional "waters of the U.S.," including wetlands, streams, open waters, et al., are defined by 33 CFR 328.3(b) and are protected by Section 404 of the Clean Water Act (33 U.S.C. 1344), which is administered and enforced in North Carolina by the U.S. Army Corps of Engineers (USCOE), Wilmington District. Section 404 regulates the discharge of dredged or fill material in waters of the U.S. Fill material can be soil, rock, concrete, asphalt, brick or other building materials. Permit review and issuance follows a sequence process that encourages avoidance of impacts, followed by minimizing impacts and requiring mitigation for unavoidable impacts to the aquatic environment.

Floodplain management ordinance requirements are listed in the Code of Federal Regulations Title 44 Volume 1, Section 9. This regulation sets forth the policy, procedure and responsibilities to implement and enforce Executive Order 11988, Floodplain Management and Executive Order 11990, Protection of Wetlands. These regulations apply to all agency actions which have the potential to affect floodplains or wetlands or their occupants, or which are subject to potential harm by location in floodplains or wetlands. The Federal Emergency Management Agency (FEMA), in cooperation with federal, state, and local governments, has developed floodway and floodplain boundaries and Flood Insurance Rate Maps (FIRM) for Mecklenburg County.

United States Department of Transportation Order 5650.2, *Floodplain Management and Protection*, prescribes policies and procedures for ensuring that a detailed analysis is included in the environmental document and that proper consideration is given to the avoidance and mitigation of adverse floodplain effects. This analysis should discuss any risk to, or resulting from, the proposed project, the impacts on mutual and beneficial floodplain values, the degree to which the proposed project provides direct or indirect support for development in the floodplain and measures to minimize harm or restore or preserve the natural and beneficial floodplain values affected by the project.

Groundwater standards are listed in the North Carolina Administrative Code (NCAC) Title 15A – Environment and Natural Resources, Subchapter 2L. These standards are intended to maintain and preserve the quality of groundwaters, prevent and abate pollution and contamination of the waters of the state, protect public health and permit management of the groundwaters for their best usage by the citizens of North Carolina. The North Carolina Division of Water Quality (NCDWQ) is a division of the North Carolina Department of Environment and Natural Resources (NCDENR). The Groundwater Protection Unit of the NCDWQ Aquifer Protection Section is charged with regulating groundwater by preventing pollution, managing and restoring degraded groundwater and protecting groundwater resources. This is accomplished by implementing both groundwater and surface water pollution prevention strategies, compliance assessments and abatement programs, all of which contribute to the protection of human health and the environment.

The NCDWQ Groundwater Investigation Unit (GWIU) supports NCDWQ's efforts to assess water quality impacts and to implement effective planning and monitoring programs. The GWIU provides technical expertise on drilling, well locations, and construction details during the planning stages of water quality investigations, and provides logistical support for water quality monitoring and aquifer testing and performs well repair and abandonment. The Groundwater Protection Unit of the NCDWQ Aquifer Protection Section helps protect and preserve the quality of North Carolina's groundwater resources by implementing pollution prevention strategies, compliance assessments, and abatement programs.

Methodology

Background research on water resources, including streams, wetlands and other area features was conducted prior to field investigations. Sources consulted include the following:

- U.S. Geological Service (USGS) 7.5-minute quadrangle maps (Charlotte East (1991), Derita (1993), and Harrisburg (1993)).
- U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory Map (Charlotte East, Derita and Harrisburg).
- U.S. Department of Agriculture (USDA) Soil Conservation Service (SCS) (now known as Natural Resources Conservation Service (NRCS)) Soil Survey of Mecklenburg County, NC (1980).
- USDA NRCS Web Soil Survey 2.2 (2008).
- Charlotte-Mecklenburg Property Ownership and Land Records Information System (POLARIS).
- NCDENR Division of Water Quality website (Accessed September, 2008).
- Charlotte-Mecklenburg Land Use and Environmental Services Agency (LUESA) website (Accessed September, 2008).

Field surveys were conducted along the proposed Light Rail Alternative corridor by STV/RWA scientists on multiple dates between September 2, 2008 and December 5, 2008. Additional field surveys were conducted along the railroad right-of-way portion of the alignment on February 9, February 11, and February 13, 2009. Additional field surveys for areas added to the project were conducted on June 6, July 21 and 28, October 1 and November 5, 2009. The field investigators walked the following locations: the proposed Light Rail Alternative right-of-way, which measures approximately 200 feet wide; the proposed station locations; the proposed park-and-ride facility locations; and, the area encompassing the Light Rail Alternative – Sugar Creek Design Option.

Wetlands were identified in general accordance with the methods prescribed in the USCOE Wetland Delineation Manual (Environmental Laboratory, 1987) and were delineated and flagged in the field with blue and white striped surveyors tape. The boundaries were surveyed with a Trimble GeoXT hand-held Global Positioning System (GPS) unit capable of sub-meter accuracy and mapped using ArcGIS 9.1 software. Streams were identified and assessed in the study area and photographs were taken. Stream and wetland jurisdictional boundaries, as well as the hydrologic classification were field-verified by the USCOE and NCDWQ on July 21, 2009 (Action I.D. 200901062). Subsequent to this agency field review, the USCOE issued a Notification of Jurisdictional Determination dated October 21, 2009 and updated December 2, 2009.

CHAPTER 12.0: AIR QUALITY

Legal and Regulatory Context

Air Quality Standards

Air quality is regulated under the federal Clean Air Act (CAA) of 1970 and 1990, as amended (42 USC Sections 7401-7671q). The CAA was enacted for the purposes of protecting and enhancing the quality of the nation's air resources to benefit public health, welfare and productivity. The Environmental Protection Agency (EPA) is the federal regulatory agency charged with administering the CAA. The CAA established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation and buildings.

The EPA classifies urban environments as being either in "attainment" or "non-attainment." An urban area that exceeds the NAAQS for one or more pollutants is said to be in "non-attainment" of the NAAQS enforced under the CAA. The EPA established primary and secondary NAAQS for six air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), particulate matter (PM) and lead (Pb). The designation of an area is determined on a pollutant-by-pollutant basis.

Attainment areas can be further categorized as a maintenance area for attainment, which means that the urban area has exceeded NAAQS levels for one or more pollutants in the past. Efforts in these maintenance areas must be made in order to maintain the status quo and not exceed the NAAQS. Non-attainment areas are classified in severity by pollutant depending on the degree of exceedance(s) over the NAAQS.

In accordance with 40 CFR 93.116, a “Federal Highway Administration/Federal Transit Administration project must not cause or contribute to any new localized CO or Particulate Matter of less than 10 micrometers or less (PM₁₀) violation or increase the frequency or severity of any existing CO or PM₁₀ violation in CO and PM₁₀ non-attainment and maintenance areas. This criterion is satisfied if it is demonstrated that no new local violations will be created and the severity or number of existing violations will not be increased as a result of the project.”

Project-Level Conformity Determination

The CAA requires that a State Implementation Plan (SIP) be prepared for each non-attainment or maintenance area. The SIP is a state plan of ways it will meet the NAAQS under the deadlines established by the CAA. The SIP is approved by the EPA, but contained within the state air pollution laws.

In North Carolina, the North Carolina Department of Environment and Natural Resources, Division of Air Quality (DAQ) develops the SIP, which is the document that describes how North Carolina will maintain or achieve compliance with the NAAQS (NCGS 143-215). Metropolitan Planning Organizations (MPOs) must then demonstrate that expected emissions from their transportation system are within the mobile source emission budgets in the applicable SIP. Transportation projects must come from conforming transportation plans/programs, and conforming transportation plans/programs must conform to the SIP.

The process of ensuring that a region’s transportation planning activities contribute to attainment of the NAAQS, or “conform” to the purposes of SIP, is referred to as transportation conformity. In order to receive federal transportation funds within a non-attainment area or a maintenance area, the area must demonstrate through a federally mandated conformity process that the transportation investments, strategies and programs, taken as a whole, contribute to the air quality goals defined in the state air quality plan. Mecklenburg County is required to complete conformity analyses on its transportation plan with respect to mobile source emission budgets due to the air quality “maintenance area” designation for CO.

Project level conformity decisions are made on entire projects as defined by the CAA. Any transportation project funded through the Federal Transit Administration (FTA) must be listed in the metropolitan region’s Transportation Improvement Program (TIP). The TIP identifies the transportation projects and strategies that the Metropolitan Planning Organization (MPO) and state Department of Transportation plan to undertake. The TIP is the region’s way of allocating its limited transportation resources among the various capital and operating needs of the area, based on a clear set of short-term transportation priorities. The TIP must conform to the SIP for air quality in accordance with the CAA. The LYNX BLE is included in the Mecklenburg-Union Metropolitan Planning Organization (MUMPO) conforming Transportation Improvement Program (TIP) entitled (*2009-2015 Transportation Improvement Program*, May 2008).

Additionally, Mecklenburg County, as part of MUMPO, prepared a *Conformity Analysis and Determination Report*, dated June 8, 2005 and amended October 1, 2005. The purpose of this report was to comply with the provisions of the CAA in concurrence with all conformity requirements as detailed in 40 CFR Parts 51 and 93 (the Transportation Conformity Rule) and 23 CFR Part 450 (the Metropolitan Planning Regulations as established in the Transportation Equity Act for the 21st Century [TEA-21]).

Methodology

This section describes the methodology for the air quality analysis performed. The methodology reviews the established NAAQS concentration levels, the guidance used for modeling air quality, and the types of models used as part of the LYNX BLE air quality analysis.

National Ambient Air Quality Standards

The most recent NAAQS (CO, NO₂, SO₂, O₃, PM₁₀, PM_{2.5}, and Pb) were obtained from EPA’s website and are listed in Table H-1. North Carolina adopted national 8-hour standard for O₃, on April 1, 1999.

**Table H-1
National Ambient Air Quality Standards (NAAQS)**

Pollutant	Standard Value [parts per million (ppm); micrograms per cubic meter (µg/m ³)]		Standard Type
Carbon Monoxide (CO)			
8-hour Average ¹	9 ppm	(10 µg/m ³)	Primary
1-hour Average ¹	35 ppm	(40 µg/m ³)	Primary
Nitrogen Dioxide (NO₂)			
Annual Arithmetic Mean	.053 ppm	(100 µg/m ³)	Primary & Secondary
Ozone (O₃)			
1-hour Average ^{1,6}	.12 ppm	(235 µg/m ³)	Primary & Secondary
8-hour Average ⁵	.075 ppm	(235 µg/m ³)	Primary & Secondary
Lead (Pb)			
Quarterly Average	.15 µg/m ³	--	Primary & Secondary
Particulate (PM₁₀)			
Annual Arithmetic Mean	(Revoked) ²	--	Primary & Secondary
24-hour Average ¹	(150 µg/m ³)	--	Primary & Secondary
Particulate (PM_{2.5})			
Annual Arithmetic Mean ³	(15 µg/m ³)	--	Primary & Secondary
24-hour Average ⁴	(35 µg/m ³)	--	Primary & Secondary
Sulfur Dioxide (SO₂)			
Annual Arithmetic Mean	.03 ppm	(80 µg/m ³)	Primary
24-hour Average ¹	.14 ppm	(365 µg/m ³)	Primary
3-hour Average ¹	.50 ppm	(1300 µg/m ³)	Secondary
Source: USEPA website: http://www.epa.gov/air/criteria.html			
¹ -Not to be exceeded more than once per year			
² -As of December 17, 2006, the EPA revoked the annual PM ₁₀ standard			
³ -3 year average of annual mean within an area must not exceed 15 µg/m ³			
⁴ -3 year average of 98th percentile of 24-hour concentrations at each monitor within an area must not exceed 35 µg/m ³			
⁵ -3 year average of the 4th highest daily maximum 8-hour average ozone concentrations, measured at each monitor within an area over each year, must not exceed 0.075 ppm.			
⁶ -As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone non-attainment Early Action Compact (EAC) Areas.			

Air Quality Analysis Guidance

In order to demonstrate NAAQS would not be exceeded by the alternatives studied in this Draft EIS, an air quality analysis was performed to estimate the maximum localized 1-hour and 8-hour CO concentrations caused by vehicular traffic associated with the No-Build and Light Rail Alternatives. Guidance in the following documents was used for microscale CO modeling for various intersections and proposed parking facilities within the project study area.

- North Carolina Division of Air Quality, (September 2007) *Guidelines for Evaluating the Air Quality Impacts of Transportation Facilities*.

- US EPA Office of Air Quality Planning and Standards, EPA-454/R-92-005, (November 1992), *Guidelines for Modeling Carbon Monoxide from Roadway Intersections*.
- Federal Highway Administration, (July 2001), *Transportation Conformity Reference Guide*.
- All applicable federal, State and local regulations, including:
 - 40 CFR 93 (Determining Conformity of Federal Actions to State or Federal Implementation Plans)
 - 15 North Carolina Administrative Code 2D.0800, 2D.1600 (General Conformity), 2D.2000 (Transportation Conformity)
 - Mecklenburg County Air Pollution Control Ordinance (MCAPCO)

In accordance with 40 CFR 93.105(c)(1)(i), Interagency Consultation Procedures, the Air Quality Section of the Mecklenburg County Land Use and Environmental Services Agency (LUESA) was consulted in March 2009, prior to initiating the microscale assessment and employing the planned project methodology.

Impacts

The potential for negative impacts is expressed quantitatively or with the following qualitative terms. Because the regulations require that a project does not result in a new violation of the NAAQS, impacts are assessed in two categories:

- No impact: This category applies to an alternative if there would be no change in ambient air quality in the corridor or an improvement would result.
- Potential impact: This category applies to an alternative if there would be a violation of 1-hour or 8-hour NAAQS.

Models for Predicting Carbon Monoxide Concentrations

Three computer models were utilized as part of the LYNX BLE Air Quality Analysis. MOBILE6.2 was used to generate emission factors; CAL3QHC Version 2.0 was employed for microscale intersection analyses; and, Point, Area, and Line Source Algorithm (PAL) used for the analysis of parking facilities.

MOBILE6.2 Emission Factors

The MOBILE6.2 emission factor model, the latest update to the MOBILE model for use by state and local governments to meet CAA requirements, was used for estimating CO concentrations along roadways and at parking facilities within the proposed project corridor. MOBILE6.2 was used for the regional transportation conformity demonstration as part of the 2030 Long Range Transportation Plan (LRTP) update, which included the LYNX BLE. Input and assistance from the Mecklenburg County LUESA Air Quality Section was necessary to confirm the use of MOBILE6.2 for this project-level hot spot analysis, determine the emissions factors, and to obtain background concentrations and the persistent factor for CO.

CAL3QHC Version 2.0 Microscale Modeling Methodology

Mobile source dispersion models are the basic analytical tools used to estimate pollutant concentrations from the emissions generated by motor vehicles under given conditions of traffic, roadway geometry and meteorology. CAL3QHC Version 2.0 is a line-source dispersion model that predicts pollutant concentrations near congested intersections and heavily traveled roadways. CAL3QHC Version 2.0, which predicts inert pollutant concentrations, averaged over a 1-hour period near roadways, was used to predict concentrations at the identified affected study area intersections.

A traffic operations analysis was performed on all of the existing intersections and intersections proposed to have major modifications in the project study area. The analysis was performed for 2008 and 2030 for the No-Build Alternative, Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option. The results of this analysis are included in the *Air Quality Technical Report* (January 2010).

Based upon this analysis and the interagency consultation process, key intersections were identified for modeling. Table H-2 illustrates the intersections that were identified for modeling using CAL3QHC Version 2.0 for 2008 and 2030. The modeling results were compared to the 1-hour and 8-hour NAAQS for CO to determine whether the receptors, identified in accordance with the *Guidelines for Modeling Carbon Monoxide from Roadway Intersections* (EPA 1992), would experience air quality impacts.

**Table H-2
Intersections Identified for Modeling**

Intersection	Peak Periods
North Tryon Street/US-29 & Sugar Creek Road	a.m. and p.m.
North Tryon Street/US-29 & I-85 Connector	a.m. and p.m.
North Tryon Street/US-29 & University City Boulevard	a.m. and p.m.
North Tryon Street/US-29 & W.T. Harris Boulevard	a.m. and p.m.
North Tryon Street/US-29 & Mallard Creek Church Road	a.m. and p.m.

PAL Modeling Methodology

In accordance with Mecklenburg County Air Pollution Control Ordinance (MCAPCO) and the *Guidelines for Evaluating the Air Quality Impacts of Transportation Facilities* (EPA, 1992), the PAL algorithm was used to model carbon monoxide concentrations at proposed parking lots and garages. All parking lots and garages subject to evaluation under MCAPCO were evaluated using the PAL algorithm.

The Mecklenburg County LUESA Air Quality Section requires permits (under MCAPCO Section 2.0805) if new construction or expansion of a parking deck or garage is undertaken resulting in a parking capacity of at least 750 spaces or a potential parking area of at least 225,000 square feet. Permits also are required if new construction or expansion of a combination of parking lots, decks and garages is undertaken resulting in a parking capacity of at least 1,000 spaces or a potential parking area of at least 300,000 square feet. Similarly, permits are required if new construction or expansion of an existing parking lot or combination of parking lots is undertaken resulting in a parking capacity of at least 1,500 spaces or a potential parking area of at least 450,000 square feet. Exceptions to these general rules are contained in the regulations, but do not currently apply to the proposed Light Rail Alternative or the design option. Confirmation of permit applicability would be sought from Mecklenburg County LUESA Air Quality Section as the proposed project design advances and parking spaces and station site plans are finalized.

CHAPTER 13.0: NOISE AND VIBRATION

Legal and Regulatory Context

The process for assessing the potential impact for noise and vibration reported in this Draft EIS followed the U.S. Federal Transit Administration (FTA) guidance manual *Transit Noise and Vibration Impact Assessment* (May 2006). This process involves three levels of assessment: 1) screening, 2) general assessment, and 3) a detailed assessment. A screening is typically done for locating project alignments and involves the identification of noise sensitive receptors along a corridor. A general assessment identifies the existing noise levels, the noise sensitive receptors along a corridor, projects a project-related noise level, estimates potential impact and recommends a range of mitigation options. A detailed assessment is usually completed during final design and identifies specific noise conditions for each sensitive receptor along with specific mitigation methods. For purposes of this Draft EIS, a general assessment was conducted. As a result of the potential impacts a detailed noise assessment will be initiated.

Human Perception of Noise

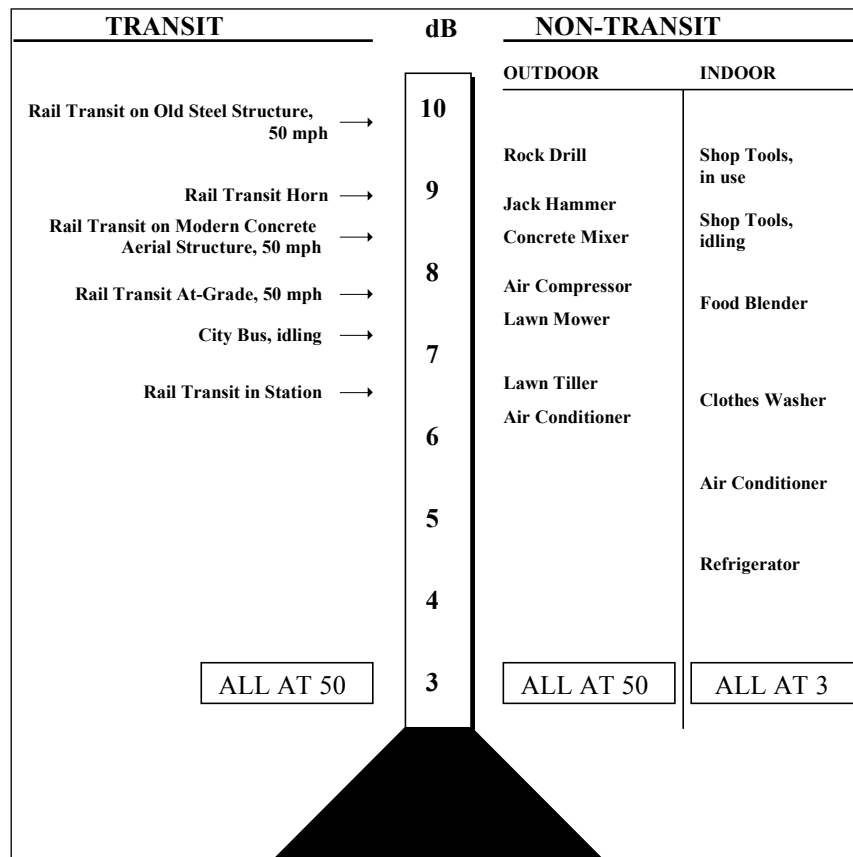
Noise is typically defined as unwanted or undesirable sound. Urban environments are comprised of “background noise” consisting of daily urban sounds such as traffic, air conditioners, telephones, bird calls and other familiar noises. Human reaction to sounds above this background noise is dependent on the intensity or level (such as high or low pitch sounds), the frequency and the variation in the sound level. The US Environmental Protection Agency (EPA) has studied human annoyance to noise and has quantified the level of noise that most humans recognize in an urban environment as new noise. Community reaction in the EPA studies identified ranges of reaction from “no reaction” to “vigorous action.” The body of research developed by the EPA on the subject of noise served as the basis for the development of the FTA guidance manual for identifying noise and vibration impacts for transit projects entitled *Transit Noise and Vibration Impact Assessment* (May 2006).

Noise is generated in two ways: through the air as “airborne noise” and through the ground as “ground-borne noise.” Airborne noise is the most common form of noise while ground-borne noise is created from vibration, such as the rattling of dishes that occurs in houses located close to freight railroad tracks.

Noise is measured in a logarithmic unit called a decibel (dBA). Human perception of noise is measured in decibels on a scale that has been weighted to middle and high frequency sounds that are more discernible to humans. This scale is called an A-weighted scale. By using this scale, the range of normally encountered sound can be expressed by values from 0 to 120 decibels. On a comparative basis, a 3-decibel change in sound level generally represents a barely-noticeable change outside the laboratory, whereas a 10-decibel change in sound level would typically be perceived as a doubling (or halving) in the loudness of a sound.

Noise levels are commonly measured and analyzed in two ways: Leq (sound level equivalent) and Ldn (24-hour day night average). Leq is a steady sound level over a specified period of time, such as one hour. It is often used to determine noise near areas where quiet is essential at all hours, such as a school or a park. The Ldn is commonly used to describe the 24-hour day-night average and assigns a 10-decibel penalty to nighttime hours. Ldn is commonly used to analyze noise impacts in areas where people sleep. Figure H-1 provides examples of typical noise environments and criteria. In most communities, Ldn is generally found to range between 55 dBA and 75 dBA. As shown in Figure H-1, this spans the range between an “ideal” residential environment and the threshold for an unacceptable residential environment according to U.S. Federal agency criteria.

Figure H-1
Typical Noise Environments



Source: FTA *Transit Noise and Vibration Impact Assessment*, May 2006.

FEDERAL TRANSIT ADMINISTRATION NOISE CRITERIA

The general noise assessment identifies buildings or properties within proximity to the project area with the potential to experience a noise impacts. With respect to rail noise, the FTA has established criteria to assess potential impacts of transit projects. These criteria do not generally apply to industrial or commercial areas since they are generally compatible with high noise levels. These criteria group noise sensitive land uses into the following three categories:

Category 1: Buildings or parks where quiet is an essential element of their intended purpose.

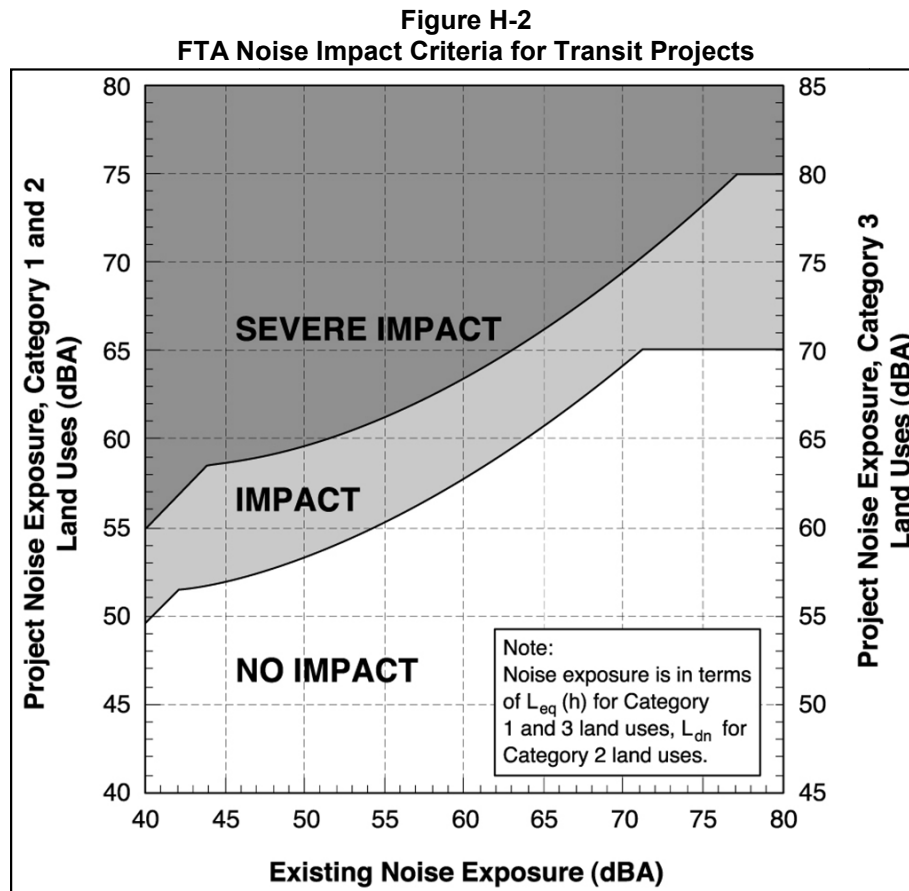
Category 2: Residences and buildings where people normally sleep. This includes residences, hospitals and hotels where nighttime sensitivity is assumed to be of utmost importance.

Category 3: Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material.

Noise impacts resulting from a proposed project are determined by comparing the existing and future project-related outdoor noise levels as illustrated in the graph provided in Figure H-2. Existing noise exposure is shown on the x-axis, horizontal, of the graph, and the y-axis, vertical, shows the additional noise exposure from the transit project that would cause either moderate or severe impact. Essentially, as the existing level of ambient noise increases, the allowable level of transit noise also increases, but the total amount, by which that community's noise can increase, without an impact, is reduced. Noise level increases, defined by the FTA guidance as "moderate impacts" or "severe impacts", occur when the existing levels are surpassed by more than the allowable increase by the project-related noise.

The FTA definitions for levels of impact are summarized as follows:

- **No Impact:** In this range, the project-related noise levels would not introduce a new source of noise that would be discernable over existing noise.
- **Moderate Impact:** In this range of noise impact other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation and the cost effectiveness of mitigating noise to more acceptable levels. The change in cumulative noise is noticeable to most people, but may not be sufficient to cause strong, adverse community reactions.
- **Severe Impact:** Severe noise impacts are considered "significant" as used in the National Environmental Policy Act (NEPA) and in the implementing regulations (40 CFR 1508.27). Noise mitigation would normally be specified for severe impact areas unless there is no practical method of mitigating the noise.

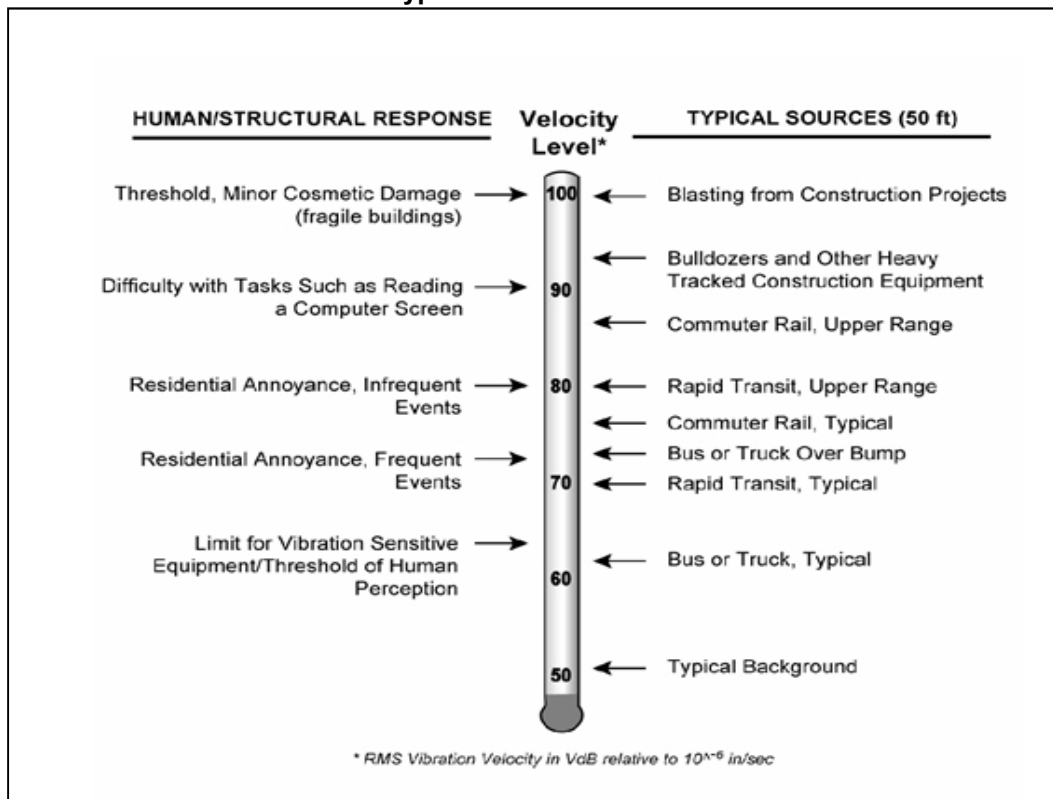


Human Perception of Ground-Borne Vibration

In addition to noise, rail transit projects have the potential to cause ground-borne vibration. Ground-borne vibration generally occurs most frequently with transit systems that are built underground. However, at-grade rail transit projects can also result in ground-borne vibration under certain soil and rock conditions. Ground-borne vibration is vibration that moves through the ground to a stationary object, such as a building. An example of ground-borne vibration is movement of wall hangings as a freight train passes by a residence. Ground-borne vibration from transit vehicles is usually characterized in terms of the “smoothed” root mean square (RMS) vibration velocity level, in decibels (VdB), with a reference quantity of one micro-inch per second. VdB is used in place of dB to avoid confusing vibration decibels with sound decibels.

Figure H-3 illustrates typical ground-borne vibration levels for common sources. As shown, the range of interest is from approximately 50 to 100 VdB, from imperceptible background vibration to the threshold of damage. Although the approximate threshold of human perception of vibration is 65 VdB, annoyance is usually not significant unless the vibration exceeds 70 VdB.

Figure H-3
Typical Vibration Levels



Source: FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

Federal Transit Administration Vibration Criteria

Similar to the FTA noise criteria, the FTA vibration criteria are based on three land use categories, although the categories are somewhat different. One important difference is that outdoor spaces are not included in category 3 for vibration. This is because human annoyance from ground-borne vibration requires the interaction of the ground vibration with a building structure. Consequently, the criteria apply to indoor spaces only and there are no vibration impact thresholds for outdoor spaces such as parks. Table H-3 illustrates the FTA ground-borne vibration impact criteria, based on land use and train frequency. For residential buildings (category 2), the threshold applicable to this project is 72 VdB. The applicable threshold for schools and churches (category 3) is 75 VdB. There are some buildings, such as concert halls, recording studios and theaters, which can be very sensitive to vibration but do not fit into any of the three categories listed in Table H-3. Due to the sensitivity of these buildings, they usually warrant special attention during the project development process of a transit project.

It should also be noted that Table H-3 includes separate FTA criteria for ground-borne noise, the “rumble” that can be radiated from the motion of room surfaces in buildings due to ground-borne vibration. Although expressed in dBA, which emphasizes the more audible middle and high frequencies, the criteria are set significantly lower than for airborne noise to account for the annoying low-frequency character of ground-borne noise. Because airborne noise often masks ground-borne noise for above-ground (i.e. at-grade or elevated) rail systems, ground-borne noise criteria are primarily applied to subway operations where airborne noise is not a factor. For the at-grade transit system associated with the Light Rail Alternative and Light Rail Alternative – Sugar Creek Design Option, ground-borne noise criteria are applied only to buildings with sensitive interior spaces that are well insulated from exterior noise where a potential for exposure may occur.

**Table H-3
Ground-Borne Vibration (GBV) and Ground-Borne Noise (GBN) Impact
Criteria for General Assessment**

Land Use Category	GBV Impact Levels (VdB re: 1 micro-inch / sec)			GBN Impact Levels (dBA re: 20 micro Pascals/sec)		
	Frequent Events ¹	Occasional Events ²	Infrequent Events ³	Frequent Events ¹	Occasional Events ²	Infrequent Events ³
Category 1: Buildings where vibration would interfere with interior operations	65 VdB	65 VdB	65 VdB	n/a ⁴	n/a ⁴	n/a ⁴
Category 2: Residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primary daytime use	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

¹ “Frequent Events” is defined as more than 70 vibration events per day.

² “Occasional Events” is defined as between 30 and 70 vibration events per day.

³ “Infrequent Events” is defined as less than 30 vibration events per day.

⁴ n/a means “not applicable”. Vibration-sensitive equipment is not sensitive to ground-borne noise.

Source: FTA, *Transit Noise and Vibration Impact Assessment*, May 2006.

Methodology

The procedures utilized for the Noise and Vibration general assessment were based on guidelines contained in the FTA’s *Transit Noise and Vibration Impact Assessment* (May 2006). In general, the approach follows the General Assessment guidelines outlined in the FTA Guidance Manual.

FTA Approach

The FTA approach, recommended for projects in the Draft EIS phase of project development, is as follows:

1. Identification of representative noise-sensitive and vibration-sensitive receptors (i.e. residences, schools, churches, medical facilities and passive use public recreation areas). Sensitive land uses along the corridor were identified first using aerial photography and subsequent field visits. Sensitive receptors were then grouped together based on their location relative to the tracks, grade crossings and other geography and LYNX BLE operational factors that might affect noise and vibration levels. Within each grouping, a representative receptor was included in the noise model (see step 3).
2. Determination of existing noise and vibration levels. The monitoring of existing noise levels was conducted at a number of locations along the corridor. Both short-term (1-hour) and long-term (24-hours) noise monitoring was conducted. Twenty-four hour monitoring was conducted at more sensitive, receptors and or locations where significant variations in hour-to-hour noise levels could occur. Vibration monitoring data previously conducted by the University of North Carolina at Charlotte (UNC Charlotte) was also reviewed.
3. Application of FTA’s noise and vibration screening procedures were utilized to eliminate noise- and vibration-sensitive receptors at which impacts would be unlikely. For receptors that were not eliminated by the screening process, noise and vibration general assessment procedures were used to predict future noise and vibration levels from proposed LYNX BLE operations. When the required input data was available, the FTA equations for detailed noise analysis were used in the assessment. Noise prediction equations were based on the forecasted number of daily light rail vehicles and the

distribution of these vehicles throughout the day (early morning, daytime and nighttime), the distance from the tracks, the vehicle speed and other site-specific conditions such as acoustic shielding, substations, access roads and grade crossings. For the prediction of potential vibration impacts, generalized curves provided in the FTA guidance manual were utilized along with a speed adjustment equation. Special consideration was given to sensitive vibration receptors at UNC Charlotte.

4. Assessment of potential noise and vibration impacts were conducted for the Light Rail Alternative as well as the Light Rail Alternative – Sugar Creek Design Option using noise prediction models, the generalized vibration curve and speed adjustment equations for vibration from the FTA Manual. Assessments for these options were specifically conducted to address receptor locations that would not be affected by, or are affected differently from, the Light Rail Alternative or the Light Rail Alternative – Sugar Creek Design Option. In addition to these quantitative assessments, sensitive noise locations affected by wheel squeal were identified and assessed qualitatively.
5. Mitigation measures were identified to reduce potential noise and vibration impacts.

Analysis Assumptions

To perform the general assessment for noise and vibration, the following assumptions related to operational data and methodological approach were included in the analysis. The following serves as a reference for these assumptions:

- 12.4 trains per hour during the day (7:00 a.m. to 10:00 p.m.);
- 5.33 trains per hour during nighttime (10:00 p.m. to 7:00 a.m.);
- Two cars per train;
- Speed limits range from 25 to 55 miles per hour (mph);
- Retaining walls with at least 3 feet above the rail would act as sound barriers, resulting in a four-decibel noise reduction;
- All light rail vehicles approaching roadway-rail grade crossings blow their horn for five seconds prior to reaching a grade crossing;
- Existing LYNX Blue Line vehicle skirt coverings are for aesthetic purposes only and do not result in any appreciable noise attenuation;
- Wheel squeal noise levels are highly variable and therefore not included in actual noise projections;
- Roadway-rail crossings assumed at 7th Street, 8th Street, 9th Street, 12th Street, 16th Street, Orr Road, Arrowhead Drive, Owen Road, Tom Hunter Road, Orchard Trace Lane, University City Boulevard Station Park and Ride entrance, Shopping Center Drive, McCullough Drive, JM Keynes Drive, Ken Hoffman Drive, JW Clay Boulevard and Mallard Creek Church Road.
- For the Light Rail Alternative – Sugar Creek Design Option, roadway-rail crossings also assumed at Lambeth Drive, Eastway Drive, Old Concord Road and Raleigh Street.

CHAPTER 14.0: ENERGY USE

Legal and Regulatory Context

There are no additional regulations, other than the National Environmental Policy Act (NEPA), that direct the analysis of potential impacts to energy use.

Methodology

Study Area

The study area for energy is comprised of the alignment and stations for the Light Rail Alternative and the Light Rail Alternative – Sugar Creek Design Option.

Existing Conditions

Information on existing energy expenditures was obtained from the following documents and plans:

- US Department of Energy. (2008). *Transportation Energy Data Book: Edition 27-2008*.

- Energy Information Administration. (2009). *State Energy Profiles: North Carolina*. Accessed May 7, 2009 from http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=NC.

Impacts

Direct energy consumption for the No-Build Alternative, Transportation System Management (TSM) Alternative and the Light Rail Alternative was calculated for the year 2030 based on regional travel forecasts in terms of vehicle miles traveled (VMT) and energy consumption levels by vehicle classification. Data for energy consumption levels were obtained from:

- US Department of Energy. (2008). *Transportation Energy Data Book: Edition 27-2008*.
- City of Charlotte. (2009). Regional Travel Demand Model (TC 5 Calib6 MHYBRID H60).
- City of Charlotte. (2009). LYNX Blue Line Extension Bus and Rail Operating and Maintenance Cost Estimates.

Indirect energy consumption is estimated based on the proposed infrastructure and associated energy factors obtain from the following documents and plans:

- Charlotte Area Transit System (2009). *LYNX Blue Line Extension 15% Preliminary Engineering Design Plans and Cost Estimate (May 2009)*.
- Caltrans. (1983). *Energy and Transportation Systems*.

The potential for negative impacts is expressed quantitatively or with the following qualitative terms.

- No impact: This category applies to an alternative if there would be no change in energy in the corridor or if a benefit would result.
- Potential impact: This category applies to an alternative if it entails an increase in direct regional transportation energy or if the indirect energy would not be offset by operational energy savings over the life of the project.
- Potentially significant impact: This category applies if there would be an increase in direct regional transportation energy of more than 0.5 percent, or if the proposed action would result in energy demands for construction and ongoing operations that could significantly affect regional energy sources or fuel availability.

CHAPTER 15.0: HAZARDOUS AND CONTAMINATED MATERIALS

Legal and Regulatory Context

Numerous regulations govern the handling of hazardous and contaminated materials. A summary of key regulations directing the investigations pertinent to this Draft Environmental Impact Statement (Draft EIS) include:

- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), (42 U.S.C. §9601, et seq)
 - Provides for liability, compensation, cleanup and emergency response for hazardous substances released into the environment and the cleanup of inactive hazardous waste disposal sites.
- Superfund Amendments and Reauthorization Act (SARA),
 - Amends CERCLA in 1986 to provide a program to address abandoned hazardous waste sites.
- Resource Conservation and Recovery Act of 1976 (RCRA), as amended, (42 U.S.C. §6901, et seq)
 - Regulates the treatment, storage, transportation and disposal of solid hazardous waste. Subtitle I establishes regulatory program that prevents, detects and cleans up releases from underground storage tank systems (USTs) containing petroleum or hazardous substances.

Methodology

Study Area

The study area included the LYNX BLE stations park-and-ride locations and properties immediately adjacent to the Light Rail Alternative and the Light Rail Alternative – Sugar Creek Design Option alignments.

Existing Conditions

Hazardous/contaminated materials evaluations were conducted within the study area during 2009. These evaluations were conducted to identify recognized environmental conditions (RECs), historical recognized environmental conditions (HRECs) and the likelihood of soil and groundwater contamination. These evaluations were conducted in general accordance with the American Society for Testing and Materials (ASTM) Standard for Environmental Site Assessments (ESA): *Phase I Environmental Site Assessment Process (ASTM E-1527-05)*.

The long nature of the rail corridor and the objectives of determining immediate potential impacts to the proposed LYNX BLE necessitated some deviation from the ASTM standards. These limitations are documented in each of the limited Phase I ESA's performed.

Activities completed during the limited Phase I Environmental Site Assessment (ESA) included:

- Field Review - a limited site reconnaissance was conducted to identify potential evidence of contamination;
- Database Search - a review of state and federal databases of previously reported environmental violations; and,
- Review of Phase I ESAs - a review of ESAs completed in the study area for other projects as provided by other City departments.

The findings of these evaluations are summarize and are documented in more detail in the limited Phase I ESA completed under separate cover, for each of the following:

- *Phase I ESA, Proposed Light Rail Alternative Alignment Corridor Study* (September 2009);
- *Phase I ESA, Sugar Creek Station Proposed Park-and-Ride, Light Rail Alternative* (May 2009);
- *Phase I ESA, Sugar Creek Station Proposed Additional Park-and-Ride Lot, Light Rail Alternative* (September 2009);
- *Phase I ESA, Sugar Creek Station Proposed Park-and-Ride Lot, Light Rail Alternative Option 2* (December 2009);
- *Phase I ESA, Sugar Creek Station Proposed Park-and-Ride, Light Rail Alternative – Sugar Creek Design Option* (May 2009);
- *Phase I ESA, Old Concord Road Station Proposed Park-and-Ride, Light Rail Alternative* (April 2009);
- *Phase I ESA, Old Concord Road Station Proposed Park-and-Ride, Light Rail Alternative – Sugar Creek Design Option* (May 2009);
- *Phase I ESA, Tom Hunter Station Proposed Park-and-Ride* (April 2009);
- *Phase I ESA, University City Blvd. Station Proposed Park-and-Ride Option 1* (December 2009);
- *Phase I ESA, McCullough Station Proposed Park-and-Ride* (April 2009);
- *Phase I ESA, Mallard Creek Church Station Proposed Park-and-Ride* (April 2009); and,
- *Phase I ESA, I-485/N.Tryon Station Proposed Park-and-Ride* (April 2009 and Addendum Letter, December 2009).

Reports, completed by others, reviewed for this assessment:

- Parsons *Preliminary Phase I Corridor Report* dated April 2006;
- Hart and Hickman reports, *Impacted Soil Removal N. Tryon Street Widening* October 2004, *Results of Site Assessment Activities Former Newco Fibre Properties Charlotte, NC* September 2007, and *Phase I ESA Norfolk Southern Intermodal Facility* August 2008 provided by City of Charlotte;
- URS, *Limited Phase II Environmental Site Assessment 400 E. 33rd Street*, report received from the City of Charlotte dated September 2008;
- URS Phase I report, *400 East 33rd Street*, received from the City of Charlotte dated June 2008;
- CESI, *Report of Environmental Services at Parcel 04722133* for Crescent Resources dated March 2007;

- Law Engineering and Environmental Services Phase II report, *N.C.49/U.S. 29 Interchange Reconstruction*, received from the City of Charlotte dated September 2000; and,
- Geoscience Group, *Phase I Environmental Site Assessment Newco Fibre Site* April 2005, and *Former UST Soil Samples Newco Fibre Site* June 2005, reports provided by City of Charlotte.

Hazardous and Contaminated Materials Impact Assessment

The intent of the limited Phase I ESA's was to provide 1) an early indication of hazardous or contaminated materials that may be encountered and 2) identification of mitigation measures and associated mitigation costs for activities associated with the implementation of the alternatives under study.

CHAPTER 16.0: SAFETY AND SECURITY

Legal and Regulatory Context

CATS and the City of Charlotte follow safety and security policies of local, state, and national safety codes and standards, including:

- National Fire Protection Association (NFPA), NFPA 130, *Standards for Fixed Guideway Transit and Passenger Rail Systems* (2003);
- North Carolina State Building Code;
- International Organization for Standardization (ISO);
- American National Standards Institute (ANSI); and,
- American Society for Testing and Materials Standards (ASTM).

A Project Management Plan (PMP) is required for all projects that seek federal funds from the Federal Transit Administration (FTA) before a project is able to advance beyond the preliminary engineering phase of project development, as detailed in 49-CFR 633. The LYNX BLE PMP is required to contain a Safety and Security Management Plan (SSMP) and a Safety and Security Certification Plan (SSCP) that outlines how CATS complies with, or plans to comply with, the detailed requirements of the State Safety Oversight Program listed in 49-CFR Part 659, *Rail Fixed Guideway Systems; State Safety Oversight*. FTA administers the approval of the PMP, SSMP and the SSCP while the North Carolina Department of Transportation (NCDOT) serves as the oversight agency for all operating rail systems within the state.

Methodology

Study Area

The study area for safety and security is comprised of the Light Rail Alternative and Design Options alignments and stations.

Existing Conditions

Information on existing safety and security procedures was obtained from the CATS Office of Safety and Security. Specific information and plans were obtained and reviewed to describe existing procedures. These include the following documents and plans.

- Charlotte Area Transit System. (November 2007). *System Safety Program Plan, Revision 4*.
- Charlotte Area Transit System. (September 2007). *Northeast Corridor Safety and Security Management Plan*.
- Charlotte Area Transit System. (January 2009). *LYNX Blue Line Extension Safety and Security Certification Plan*.
- Charlotte Area Transit System. (December 2008). *LYNX Blue Line Extension Design Criteria*.

Safety and Security Impact Assessment

Potential impacts are assessed in this chapter by identifying whether or not adequate provisions for safe and secure operations would be made; if the project is expected to alter patterns of auto, transit, and/or pedestrian accidents and what design features are included to minimize these accidents; and, whether or not the alternatives would improve safety and security compared to existing conditions in the corridor. Impacts are assessed using the following three categories.

- No impact – this category would apply when there would be no change in safety and security provided in the corridor, or if a benefit would result from the proposed action.
- Potential Impact – this category would apply when a potential impact may result, even if adequate provisions for safe and secure operations are in place.
- Significant Impact – this category would apply in instances where either no provisions for safety and security would be provided, the proposed project would have negative impacts on the safety and security of transit patrons, or when the project is expected to result in increased auto, transit, or pedestrian accidents.

CHAPTER 17.0: ACQUISITIONS AND DISPLACEMENTS

Legal and Regulatory Context

The Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970 (Uniform Act) provided for uniform and equitable treatment of persons displaced from their homes, businesses or farms by federal and federally assisted programs and established uniform and equitable land acquisition policies. The Uniform Act ensures that property owners receive fair market value for their property and that displaced persons receive fair and equitable treatment and do not suffer disproportionate injuries because of programs designed for overall public benefit. The North Carolina Relocation Assistance Act (North Carolina General Statutes Chapter 40A and 136) and Municipal Code of the City of Charlotte (Article V, Section 7.81) are similar state and local regulations that also ensure property owner protection.

As described in this chapter, “full acquisitions” entail the purchase of an entire parcel, whereas “partial acquisitions” entail the purchase of a portion of a parcel. “Displacements” would occur when a full acquisition is necessary, or when a partial acquisition would result in an impact that would affect the continued economic viability or use of a property. Owners and renters that would be displaced as a result of the proposed Light Rail Alternative would be eligible for relocation assistance according to federal, state and local regulations. “Temporary construction easements” (TCEs) are granted rights to use a property during construction and would not result in permanent acquisition or displacement since they would be temporary.

Methodology

Study Area

The study area for potential acquisitions and displacements is site specific and is based on the anticipated construction limits for the proposed Light Rail Alternative. Existing land uses within the anticipated construction limits include vacant land and lands adjacent to, or contiguous with, existing street or railroad rights-of-way (ROWs), industrial, residential and commercial uses.

Impacts

Impacts were determined based on the proximity of the identified properties to the proposed Light Rail Alternative. Parcel acquisitions are approximate estimates and are based on an analysis of design requirements, location of stations or line segments construction requirements and construction techniques. Potential impact information included within this chapter is based on preliminary engineering at a 30 percent design level. Specific proposed property acquisitions and displacements would be identified during final design and would be subject to coordination with railroad owners, the North Carolina Department of Transportation (NCDOT) and individual property owners along the proposed project corridor. The Final Environmental Impact Statement (Final EIS) will reflect revisions to the existing data based on the refined plans for the LYNX BLE.

The types of impacts considered herein include full and partial real estate acquisitions and displacements. The potential for negative impacts is expressed quantitatively or with the following qualitative terms:

- No impact: This category applies if an alternative is not expected to result in a negative impact to a property due to acquisition or displacement.
- Potential impact: A potential impact could occur if an alternative would result in partial acquisition of property, but would not likely result in substantial changes to property. For example, partial

acquisitions that do not affect access to a property or the general function of a property would be considered potential impacts.

- Potentially significant impact: A potentially significant impact could occur if an alternative would likely result in substantial changes that represent an “adverse impact” to the activities relating to the features and attributes of a property. Significant impacts would include full property acquisitions that result in a displacement, or partial acquisitions that represent substantial changes to the property.

The following plans and data were obtained and reviewed for development of this chapter.

- City of Charlotte/Charlotte Area Transit System. (2007). *Northeast Corridor Light Rail Project Real Estate Acquisition and Relocation Plan (Draft)*.
- STV/Ralph Whitehead Associates, Inc. Field Surveys/Land Use Inventory. September/November 2008.
- Mecklenburg County. (2009). *Mecklenburg County Tax and Property Appraiser Database*. Retrieved February 17-27, 2009, from <http://charmeck.org/Departments/Geospatial+Information+Services/Home.htm>.
- Potential acquisitions and displacements data as provided by the City of Charlotte Engineering and Property Management Department.

CHAPTER 18.0: CONSTRUCTION IMPACTS

Legal and Regulatory Context

Not applicable.

Methodology

Not applicable.

CHAPTER 19.0: SECONDARY AND CUMULATIVE EFFECTS

Legal and Regulatory Context

The evaluation of secondary and cumulative effects is based on federal and state laws, regulations, and guidelines. The Council of Environmental Quality (CEQ) regulations (40 CFR Sections 1500-1508) implement the procedural provisions the National Environmental Policy Act (NEPA) of 1969, as amended. The CEQ regulations require federal agencies to consider the potential for secondary and cumulative effects from a proposed project. These regulations also define the concepts of secondary and cumulative effects.

In addition, the assessment of secondary and cumulative effects is also a requirement of the North Carolina State Environmental Policy Act (SEPA) of 1976. North Carolina SEPA of 1976 (NCGS 113A), as amended, specifically refers to indirect and cumulative effects. These references are published in the North Carolina Administrative Code (NCAC) under the General Provisions (1 NCAC 25.0108). North Carolina uses the same definitions of indirect and cumulative effects as the federal government defines in NEPA.

Secondary Effects

The CEQ Regulations (40 CFR Section 1508.8) define “effects” as direct and secondary (indirect) effects:

- Direct Effects: Effects which are caused by the [proposed] action and occur at the same time and place (40 CFR 1508.8 (a)).
- Indirect Effects: Effects which are caused by the [proposed] action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related to effects on air and water and other natural systems, including ecosystems (40 CFR 1508.8 (b)).

The terms “effects” and “impacts” are considered synonymous, as used in the CEQ regulations. For the purpose of this chapter, “indirect effects” are referred to herein as “secondary effects.” An example of a secondary effect is when a bypass is built around a town and commercial development ensues at the interchange that would not have otherwise occurred without the construction of the bypass. The commercial development is therefore considered a secondary effect of the construction of the bypass.

Cumulative Effects

The CEQ defines the term cumulative impact as: the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

In the simplest terms, analyzing cumulative effects means considering, and accounting for, the impacts of a proposed action in the context of everything else that is going on, has gone on, or probably will go on in the vicinity of the proposed project. Once the effects have been determined, appropriate mitigation strategies can be defined to wholly or partially manage the effects contributed by the proposed project.

An example of cumulative effects would be the construction of a new bridge, a gas station and a 60-lot residential subdivision. All of which would cause the removal of nine acres of wetlands and each project would need to mitigate its proportional impact on the nine acres of wetlands. When looked at individually, each individual project impacts on wetlands seem minor, but when looked at in total, the wetland loss is much more significant.

Methodology

The following resources were used to select methods for analyzing potential indirect and cumulative effects:

- *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina*. NCDOT. (November 2001).
- *Considering Cumulative Effects under the National Environmental Policy Act*. CEQ Guidance. (1997).
- *Interim Guidance: Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process*. FHWA. (January 2003).

The following reports were used for assessing potential indirect and cumulative effects:

- The *Charlotte Northeast Corridor TOD Station Analysis* Robert Charles Lesser & Co., LLC. (September 22, 2005);
- Other Draft EIS technical reports prepared for the proposed project; and,
- Non project-related studies uncovered as part of a literature review.

Additional detail on the assessment is available in the supporting *LYNX BLE Secondary and Cumulative Effects Assessment Technical Memorandum*.