

## **Attachment 6**

### **Charlotte Area Transit System Charlotte, NC LYNX Blue Line Extension Northeast Corridor Light Rail Project**

#### **PROJECT DESCRIPTION**

##### **Narrative Description:**

The LYNX Blue Line Extension Light Rail Project consists of the design and construction of a light rail line that begins in Center City Charlotte at the terminus of the existing CATS' LYNX Blue Line light rail line near 7th Street and extends northeast towards UNC Charlotte, terminating on the UNC Charlotte campus. The proposed project would generally exist within either existing railroad or roadway rights-of-way. Some portions would be elevated up and over existing freight tracks, roads or other geographic constraints. In one location, the tracks would be depressed under an existing road. The Project is an approximately 9.4 mile dual track light rail line, with 11 stations, 18 light rail vehicles, and a storage yard/dispatch facility. Four stations will have park and ride facilities, including two parking decks.

##### **Project Description by Standard Cost Category (SCC):**

The following provides a description of the Project by Standard Cost Categories. These Standard Cost Categories are the basis for the Baseline Cost Estimate and for the Baseline Schedule contained in Attachments 3 and 4, respectively.

#### **SCC 10 - GUIDEWAY & TRACK ELEMENTS**

The guideway for the BLE consists of a ballasted track section for the entire length except as interrupted by embedded track portions necessary for project's twenty (20) at-grade crossings.

##### **10.02 Guideway: At-grade semi-exclusive (allows cross-traffic)**

This Project includes approximately 4.4 miles of at-grade semi-exclusive guideway. This includes the section of the alignment that begins just north of 7th Street, crosses 8th, 9th, proposed 10th, 12th, and 16th Streets and continues parallel with N. Brevard Street to 30<sup>th</sup> Street. It also includes the at-grade guideway within the median of North Tryon Street beginning north of Old Concord Road and ending north of JW Clay Blvd, where the guideway enters the UNC Charlotte campus. Twenty (20) at-grade crossings are included at the following locations: 7th Street, 8th Street, 9th Street, Proposed 10th Street, 12th Street, 16th Street, LRV storage yard entrance, Old Concord Road park and ride, Orr Road, Arrowhead Road, Owen Boulevard, Tom Hunter Road, Orchard Trace Lane, University City Blvd. Station park and ride entrance, Shopping Center Drive, McCullough Drive, Ken Hoffman Drive, J.M. Keynes Drive, J.W. Clay Blvd., and Institute Circle.

##### **10.04 Guideway: Aerial structure**

This subcategory includes the includes eleven (11) grade separation structures which cross over or under roads, railroads and environmental features at the following locations: (1) LRT over CSX; (2) LRT over Little Sugar Creek; (3) LRT over AC&W; (4) LRT over 36th Street; (5) LRT over Craighead/NCRR/NS; (6) LRT over Old Concord/NB North Tryon; (7) LRT over I-85 Connector; (8) LRT over University City Blvd.; (9) LRT over WT Harris Blvd; (10) LRT under northbound North Tryon; and (11) LRT over Toby Creek. The total length of aerial structure is approximately 0.7 miles.

##### **10.05 Guideway: Built-up fill**

This includes the guideway is constructed within the existing railroad right of way parallel to existing freight tracks from north of 30<sup>th</sup> Street to Old Concord Road. It also includes the section of guideway from the entrance onto UNC Charlotte northward to the project terminus at the UNC Charlotte station. Approximately 1.9 miles of the guideway is on built-up fill.

**10.06 Guideway: Underground cut and cover**

This includes is the approximately 0.6 cut and cover underpass of the LRT under northbound N. Tryon Street.

**10.08 Guideway: Retained cut or fill**

This includes is the approximately 2.3 miles of guideway that is on retained cut or fill on the approaches to the grade separation structures or along the project corridor where retaining walls are used to minimize right of way costs and other significant impacts. In general, Mechanically Stabilized Earth (MSE) walls are used for situations involving fill. Soil nail and soldier pile walls are used at various cut and fill locations as applicable to the site. Cast-in-place cantilever walls are also used.

**10.10 Track: Embedded**

This includes embedded track for at-grade street crossings.

**10.11 Track: Ballasted**

This subcategory includes the 9.33 miles of ballasted track for the mainline LRT line, insulated joint bonds, field weld kits, and track appurtenances.

**10.12 – Track: Special (switches, turnouts)**

This includes the 6 crossovers on the project, which are located south of the light rail vehicle storage yard, north of the storage yard, north of Sugar Creek Rd, north of Arrowhead Rd, south of Shopping Center Drive, and south of UNC Charlotte Station.

**10.13 Track: Vibration and noise dampening**

The noise and vibration analysis identified several limited locations which warrant vibration and/or noise dampening. The mitigation includes rubber vibration control mats under the ballast. It also includes special trackwork and sound insulation for noise mitigation at several locations.

**SCC 20 - STATIONS, STOPS, TERMINALS, INTERMODAL**

There are eleven station locations along the BLE Project.

**20.01 At-grade station, stop shelter, mall, terminal, platform**

Includes the cost for the 10 at-grade stations and the at-grade portion of the one (1) combination aerial and at-grade station located at 36<sup>th</sup> St.

**20.06 Automobile parking multi-story structure**

This subcategory includes two parking garage structures: one at the University City Boulevard station with approximately 1,500 parking spaces and one at the JW Clay Station with approximately 650 spaces. Both garages include space for active ground floor uses. The site work, pedestrian bridges, and elevators are also included in this item.

**SCC 30 - SUPPORT FACILITIES: YARDS, SHOPS, ADMINISTRATION BUILDINGS****30.01 Administration Building: Office, sales, storage, revenue counting**

An approximately 5,000 SF daily services/dispatch facility (DSDF) will be located on the northern end of the new vehicle storage yard along N. Brevard Street. This category also includes a comfort station at the Sugar Creek park and ride and the UNC Charlotte station.

**30.03 Heavy Maintenance Facility**

This includes upfits to the existing South Blvd Light Rail Facility. These upfits include segmenting the shop, OCS cable, additional LRV jacks, additional shop equipment, and extending the Track 6 mezzanine.

**30.05 Yard and Yard Track**

This includes ballasted track, turnouts, crossings, track appurtenances, switch machines and the sub-base prep for the storage yard to be located along N. Brevard St. The storage yard will accommodate 24 vehicles. Additionally, a non-electrified maintenance of way equipment track will be provided. This also includes two additional storage tracks located at the South Blvd Light Rail Facility.

## **SCC 40 SITEWORK & SPECIAL CONDITIONS**

### **40.01 Demolition, Clearing and Earthwork**

This includes the demolition, clearing and finish grading for the corridor. The roadway and site earthwork is included. However, the guideway earthwork is included in SCC 10.02 and SCC 10.05.

### **40.02 Site Utilities, Utility Relocation**

This item includes the water and sewer relocations and the storm drainage systems. This item addresses Duke Energy, AT&T and City of Charlotte aerial and underground utilities relocations. The cost for all other utility relocations will be the responsibility of the individual utility owners. This primarily involves other utilities that occupy the poles owned by Duke Energy or AT&T.

### **40.03 Haz. Material, Contaminated Soil Removal/Mitigation, Ground Water Treatment**

Costs are included for sites where previous contamination was noted in the environmental investigations and contamination occurrence has not been closed. Potential soil contamination at the existing Norfolk Southern Intermodal facility where the daily services / dispatch facility and storage yard is proposed is also accounted for in this category.

### **40.04 Environmental mitigation, e.g. wetlands, historic/archeological, parks**

This includes providing mitigation through payment to the Charlotte Umbrella Mitigation Bank or Environmental Enhancement Program (EEP) for impacts to streams and minor wetland impacts.

### **40.05 Site structures including retaining walls and sound walls**

This item includes the retaining walls project-wide and sound walls at two locations.

### **40.06 Pedestrian / bike access and accommodation, landscaping**

This item includes the cost for the pedestrian and bike amenities within the park and ride and station areas. It also includes landscaping at station areas, park-and-ride lots and corridor landscaping along North Tryon Street. The allowance for Art in Transit is also included in this item.

### **40.07 Automobile, bus, van, accessways including roads, parking lots**

Roadway improvements for the project are included in this category. Specifically, this includes the cost for the widening of North Tryon Street to accommodate light rail in the median, the cost for any side street roadway improvements, cost associated with the park and ride lots and park and ride entrance / access roadways, and roadway costs associated with the 36th Street grade separation.

### **40.08 Temporary Facilities and other indirect costs**

This includes traffic control costs and the cost for temporary widening portions of North Tryon Street in order to facilitate maintenance of traffic. The cost for temporary traffic signal modifications to the existing traffic signals along N. Tryon Street during construction is also included.

## **SCC 50 - SYSTEMS**

The system components of the Project include the following elements.

### **50.01 Train control and signals**

This includes a system-wide signal and train control system with all necessary appurtenances including interlockings, block designs, Automatic Train Protection (ATP), TWC, testing and general requirements.

### **50.02 Traffic signals and crossing protection**

This item includes the Highway Warning Crossing System protection provided for at-grade crossings along the alignment, and costs associated with the implementation of traffic signals where applicable. This includes all traffic signals that require pre-emption, intersections that require crossing protection, and new traffic signals located at the grade separations along N. Tryon St.

#### **50.03 Traction power supply: substations**

This includes seven (750 Vdc) traction power substations (TPSS) to supply power throughout the alignment, TPSS site work, testing, start-up utility service and spare parts, training and general requirements.

#### **50.04 Traction power distribution: catenary and third rail**

The BLE system is powered by an overhead catenary system (OCS). This includes OCS poles, auto/fixed tension catenary, disconnect switches, TPSS feeder cables, testing, and general requirements.

#### **50.05 Communications**

Includes the cost for communication facilities at every passenger station, park and ride lots, and parking garages including: Closed Circuit Television (CCTV), Public Announcement (PA), Variable Message Signs (VMS), SCADA, Fiber optic system, Emergency Blue Light Telephone system, Passenger Assistance Telephone system, Service Telephone system, Rail Intrusion Alarm system, ROCC monitoring and control of all elements. Also includes a Central Communication House to provide the capability to maintain full operation of the system should the ROCC be offline.

#### **50.06 Fare Collection system and equipment**

This item includes a minimum of two (2) Ticket Vending Machines (TVMs) at each station and/or park and ride facility.

#### **50.06 Technology Allowances**

This item includes allowances for technology items to support the project.

### **SCC 60 - RIGHT OF WAY**

#### **60.01 Purchase or lease of real estate**

This item includes the acquisition of right of way, permanent easements and temporary construction easements. It includes a contingency against condemnation. It also includes the cost of a capital lease for the use of the applicable North Carolina Railroad right of way.

#### **60.02 Relocation of existing households and businesses**

This item Includes payment for relocation of households and businesses in accordance with the federal Uniform Act for Relocation and Acquisition.

### **SCC 70 - VEHICLES**

#### **70.01 Light Rail**

This item includes the purchase of eighteen (18) light rail revenue vehicles. An allowance is also included to account for engineering and safety certifications.

#### **70.06 Non-revenue vehicles**

This item includes non-revenue vehicles to facilitate operation of the larger system. This includes standard sedans, heavy maintenance vehicles, and specialty vehicles for track and catenary maintenance for a total of 10 additional non-revenue vehicles.

#### **70.07 Spare parts**

This item includes allowances for the purchase of radio equipment and spare parts.

### **SCC 80 - PROFESSIONAL SERVICES**

The estimate includes soft costs to represent the costs of engineering, project and construction

management and administration, insurance, permits and fees, training/start-up/testing and force account work. Detailed labor estimates were developed for each category.

**80.01 Preliminary Engineering**

Professional, technical and management services related to the design of the project during the preliminary engineering phase of project development, including environmental work, design, engineering and architectural services, value engineering, risk assessment, scheduling, ridership modeling and analysis.

**80.02 Final Design**

Professional, technical and management services related to the design of the project during the final design phase of project development, including environmental work, design, engineering and architectural services, value engineering, risk assessment, scheduling, and operations analysis.

**80.03 Project Management for Design and Construction**

Agency staff costs to for project management during preliminary engineering, final design and construction phases.

**80.04 Construction Administration and Management**

Professional services for construction administration and management. Also includes design services during construction.

**80.05 Professional Liability and Other Non-Construction Insurance**

Includes Railroad Protective Liability Insurance costs.

**80.06 Legal; Permits; Review Fees by Other Agencies, Cities, etc.**

Includes legal services, permitting fees, and review fees.

**80.07 Surveys, Testing, Investigation and Inspection**

Includes system testing, safety and security certification.

**80.08 Start up**

Includes labor costs for pre-revenue service phase.

**SCC 90 - UNALLOCATED CONTINGENCY**

The estimate includes unallocated contingencies of 8% to be used during the construction phase of the project.

**SCC 100 - FINANCE CHARGES**

Finance charges as determined by the project financial plan.

