



**LYNX Blue Line Extension
(Northeast Corridor)**

Light Rail Project

Contract #: 08-477

WBS #: 6.03

Transportation Methodology

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Prepared for:

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CHAPTER THREE - TRANSPORTATION

1. INTRODUCTION

Chapter 3 of the proposed LYNX Blue Line Extension Draft Environmental Impact Statement (BLE Draft EIS) will address existing and future transportation conditions in Charlotte's northeast transit corridor and quantify the transportation impacts of the No-Build, Transportation System Management (TSM), and Build Alternatives. The project will potentially have transportation and traffic impacts that will include impacts to streets and highways, bikeways, parking, railroad operations, and public transit impacts.

Following is a description of the proposed methodology for evaluating the impact to local and regional traffic and transportation services and facilities that would be caused by implementation of the proposed LYNX Blue Line Extension. This includes analysis methodologies used to describe existing and future transit services, forecast patronage, general impacts on travel patterns and the transportation environment, estimation of forecast year traffic volumes under the No-Build and Build Alternatives, and the analysis of impacts of the light rail operations at intersections and railroad/highway at-grade crossings. In addition, localized increases in traffic in and around stations and impacts on intersections impacted by station location/type and proposed development intensity will be analyzed.

Generally, data required for the traffic and transportation analyses will be developed by the study team, or will be provided by either the Charlotte Area Transit System (CATS) or the Charlotte Department of Transportation (CDOT). Where data from others is needed, this is noted in the task descriptions below. CATS will provide information on existing and planned transit services and performance, and CDOT will provide existing conditions traffic data and will be responsible for providing design year travel demand forecasts, for both No-Build and Build scenarios. This will include both regional travel demand data as well as specific transit route ridership forecasts. The base year for the analysis will be 2007. The design year, for analyzing the No-Build, TSM and Build scenarios, will be 2030.

The travel demand model is that prepared by CDOT for the Mecklenburg-Union Metropolitan Planning Organization's (MUMPO) Long Range Transportation Plan and regional air quality conformity testing. The model is based on the traditional four-step travel demand process of trip generation, trip distribution, mode split, and traffic assignment. The model includes a nested-logit model for transit network assignment. Documentation for the model development and calibration process is maintained by CDOT and CATS.

2. EXISTING CONDITIONS

Following is a description of the elements that will be used to define existing transportation conditions, and the procedures to be used in developing that definition.

2.1. Travel Patterns

Existing travel patterns, defined as the number of trips between different portions of the Charlotte region as a result of the distribution of population and employment, will be defined as a base for comparison of the impact of alternative scenarios. For analytical purposes in conducting transportation analysis, the Charlotte region has been divided into a series of five “corridors” and adjacent “wedges.” The Northeast (NE) Corridor, one of those five corridors, is flanked by the East and North wedges. The study will examine travel patterns within the NE Corridor, and between corridors and wedges that might be influenced by implementation of the proposed LYNX Blue Line Extension.

2.1.1. Travel by Purpose and Orientation

To describe travel both within the region and within the study area, person-trips will be quantified for four trip purposes:

- home-based work trips
- home-based other trips
- non-home based trips
- home-based university trips.

The source of this data will be the base year travel demand model developed by CDOT.

For these same trip purposes, travel patterns both within the proposed LYNX Blue Line Extension study area and between the study area and adjacent areas will be defined. Travel patterns for the four types of person-trips will be defined to include the following trip orientations:

- Travel to Charlotte Central Business District
Northeast Corridor to Charlotte Central Business District
East wedge to Charlotte Central Business District
North/Northeast wedge to Charlotte Central Business District
Concord/Kannapolis to Charlotte Central Business District
- Cross-Town Trips and Travel Between Transit Corridor
East Wedge to South Corridor
North/Northeast wedge to South Corridor
Northeast Corridor to South Corridor
Northeast Corridor to South Wedge
Northeast Corridor to Southeast Corridor
Northeast Corridor to West Corridor
Northeast Corridor to East Wedge
Northeast Corridor to Concord/Kannapolis
- Internal Travel
Within Northeast Corridor by District

Required Data from Others

- Person-trip totals for the region and for the above listed trip pairs (from CDOT) for the base year

Presentation of Findings

- Documentation of travel by purpose calculations
- Presentation of the above listed person-trip calculations in tabular format

2.1.2. Travel by Mode

To describe travel within the study area, travel within and adjacent to the study area will be described by mode of travel for existing conditions. This base year data will be derived from the regional travel demand model prepared by CDOT. Mode shares will be reported for the Charlotte region as a whole and for the study area, and will be defined to include the following trips:

- Transit Person-Trips
 - Work related walk trips to transit
 - Work related drive trips to transit
 - Non-work related walk trips to transit
 - Non-work related drive trips to transit
- Auto Person-Trips
 - Work related trips
 - Non-work related trips
 - Drive Alone
 - Carpool 2+

Required Data from Others

- Person-trip totals for the above listed trip types (from CDOT) for the base year and for the 2030 alternatives

Presentation of Findings

- Documentation of travel by mode forecasts
- Presentation of the above listed person-trip calculations in tabular format

2.2. Public Transportation

2.2.1. Transit System Characteristics

Using existing system data provided by CATS, the following system characteristics will be described:

- Fleet characteristics
- Service area coverage
- Operating Characteristics

- Fare Structure

2.2.2. Study Area Transit Conditions

A description of existing transit services in the proposed LYNX Blue Line Extension project corridor will be provided. This will include the following:

- Route descriptions
- Route frequencies by time of day
- Hours of service
- Peak/Fleet Bus Requirements
- Ridership
- On-Time Performance by Route
- Transit Travel Times

Included will be maps illustrating proposed corridor transit services and coverage.

Required Data from Others

- Existing system route operating and performance information will be provided by CATS

2.3. Streets and Highway

2.3.1. Existing Roadway Network

A description of major north/south and east/west roadways in the proposed LYNX Blue Line Extension project corridor will be provided based on field observations within the study area and on previous documentation.

Presentation of Findings

- Documentation of the existing roadway network

2.3.2. Future Roadway Improvements

A description of future roadway improvements within the proposed LYNX Blue Line Extension project corridor will be provided. Improvements will be defined as either Programmed Improvements or Planned Improvements. Results will be summarized in tabular form.

Programmed improvements are classified as those that are included within the latest North Carolina Department of Transportation's (NCDOT) *Transportation Improvement Plan (TIP)* and the City of Charlotte *Capital Improvements Plan (CIP)* and scheduled to be undertaken within the next five to seven years.

Planned Improvements to the year 2030 are those that have been identified as needing improvements, and funding from Federal, State, and local sources is expected to be available for

their implementation by those years. These projects are identified in the draft MUMPO 2035 *Long Range Transportation Plan*.

Presentation of Findings

- Documentation of the future programmed and planned future roadway improvements
- Individual projects will be presented in tabular format.

2.3.3 Daily Traffic Volumes

Daily traffic volumes for all significant roadway segments within the proposed LYNX Blue Line Extension area of influence will be presented in tabular form. A list of the significant roadway segments are listed below, with concurrence on the significant roadway segments to be accomplished through consultation with CATS and CDOT. The most recent daily volumes available will be obtained from the CDOT and the NCDOT.

Through Street	From	To
North Tryon Street	32 nd Street	Sugar Creek Road
North Tryon Street	Sugar Creek Road	Eastway Drive
North Tryon Street	Eastway Drive	Old Concord Road
North Tryon Street	Old Concord Road	US-29 Split
North Tryon Street	US-29 Split	W.T. Harris Boulevard
North Tryon Street	W.T. Harris Boulevard	Mallard Creek Church Road
North Tryon Street	Mallard Creek Church Road	I-485
12 th Street	North Davidson Street	North Tryon Street
North Davidson Street	28 th Street	Sugar Creek Road
Sugar Creek Road	North Davidson Street	North Tryon Street
Eastway Drive	Curtiswood Drive	North Tryon Street
Old Concord Road	Orr Road	North Tryon Street
NC-49 (University City Boulevard)	I-85	North Tryon Street
NC-49 (University City Boulevard)	North Tryon Street	Shopping Center Drive
W.T. Harris Boulevard	I-85	North Tryon Street
W.T. Harris Boulevard	North Tryon Street	NC-49 (University City Boulevard)
Mallard Creek Church Road	I-85	NC-49 (University City Boulevard)
Sugar Creek Road	North Tryon Street	I-85
36 th Street	North Davidson Street	North Tryon Street
Craighead Road	Philemon Avenue	North Davidson Street
Orr Road	North Tryon Street	Old Concord Road

Required Data from Others

- Existing conditions daily traffic volumes from CDOT and NCDOT

Presentation of Findings

- Documentation of existing daily traffic volumes
- Presentation of daily volumes will be in tabular format

2.3.4 Roadway Levels of Service

Roadway Levels of Service will be calculated for the same roadway segments that were examined for daily traffic volumes. Levels of Service will be calculated using the Florida Department of Transportation's (FDOT) *2002 Generalized Level of Service Tables*. The basis for FDOT's procedures is the Transportation Research Board's Highway Capacity Manual. The calculated Levels of Service will be presented in tabular form.

Presentation of Findings

- Documentation of Level of Service calculations
- Presentation of Levels of Service will be in tabular format
- Miles of Roads by LOS in Northeast Corridor
- High Congestion Intersections

2.3.5 Travel Time

Morning and afternoon peak hour travel time studies will be conducted to determine the time required to travel from the intersection of US-29/I-485 to the Charlotte Transportation Center (Uptown Charlotte) in the morning peak period and the time required to travel from Uptown Charlotte to the intersection of US-29/I-485 in the afternoon peak period. In addition, travel time studies will also be conducted from the intersection of I-85/I-485 to the Charlotte Transportation Center (via I-77 and the Brookshire Freeway) in the morning peak period and the time required to travel from Uptown to the intersection of I-85/I-485 (via I-77 and the Brookshire Freeway) in the afternoon peak period. Two travel time runs will be performed for each route and run results, average times, and average speeds for each route will be summarized in tabular form.

Presentation of Findings

- Documentation of travel time studies
- Presentation of travel time runs will be in tabular format

2.3.3. Parking

A description of existing parking lots and garages along the proposed LYNX Blue Line Extension project corridor will be provided. Identification of each type of parking facility will be completed, along with a table depicting each type and size. An analysis of additional parking facilities needed to accommodate future riders will also be completed.

Presentation of Findings

- Documentation of the existing park facilities

2.3.4. Grade Crossing Inventory

A description of existing railroad grade crossings in the proposed LYNX Blue Line Extension project corridor will be provided. Identification of each type of grade crossing will be completed, along with a table depicting each street name, the number of tracks at the individual grade crossings, and the number of lanes and average daily traffic on the crossing roadway.

Presentation of Findings

- Documentation of the existing railroad grade crossings

2.4 Railroads

2.4.1 Freight

A description of existing freight railroad services in the proposed LYNX Blue Line Extension project corridor will be provided. There is a strong presence of freight providers in the Charlotte region. Norfolk Southern and CSX own and operate freight rail. In addition, MUMPO has updated freight railroad services in the 2030 Long Range Transportation Plan.

Presentation of Findings

- Documentation of existing freight railroad services

2.4.2 Passenger

A description of existing passenger rail services in the proposed LYNX Blue Line Extension project corridor will be provided. There is a strong presence of passenger rail providers in the Charlotte region. In addition, a potential high speed rail corridor is under study by NCDOT, and any information from the study relevant to the project will be incorporated in the analysis of the proposed LYNX Blue Line Extension

Presentation of Findings

- Documentation of existing passenger railroad services

2.5 Bikeways and Major Pedestrian Ways

2.5.1 Bicycle Facilities

The latest bicycle plan for the City of Charlotte will be researched to identify priority bikeway improvements within the Northeast Corridor. Improvements will be presented in tabular and figure format.

The City of Charlotte's Urban Street Design Guidelines will be researched to determine classifications of and appropriate bicycle facilities for major roadways within the proposed LYNX Blue Line Extension project corridor. Findings will be presented in tabular format.

Presentation of Findings

- Documentation of bicycle facility research

2.5.2 Pedestrian Ways

A general description of the conditions of sidewalks and their availability in the proposed LYNX Blue Line Extension project corridor will be presented. This description will be based on general observations made during field visits, review of aerial photography, review of station area planning documentation, and review of the City of Charlotte Capital Improvement Program. At station locations, specific descriptions and conditions will be noted of the existing sidewalk widths and setbacks.

Presentation of Findings

- Documentation of sidewalk availability and conditions. This documentation will be general in nature and will not include a detailed inventory of sidewalk locations and conditions.

3. TRANSPORTATION IMPACTS

Following is a description of the elements that will be used to define traffic, transit, and other transportation measures that will be used to define the impact of the proposed transit action, and the procedures to be used in defining those impacts. Potential impacts will be defined by comparison of the No-Build, TSM and Build scenarios.

3.1. Travel Pattern Impacts

3.1.1. Changes in Total Travel

Using regional output from the regional travel demand model for both the No-Build, TSM and Build scenarios, comparisons will be made of the following regional travel attributes:

- Vehicle-miles of travel
- Vehicle-hours of travel
- Person-miles of travel
- Person-hours of travel

Required Data from Others

- Regional model output will be provided by CDOT for both No-Build and Build scenarios

3.1.2. Changes in Trip Purpose and Orientation

Regional impacts on travel and congestion will be measured by comparing changes in vehicle miles of travel, vehicle hours of travel, and average operating speeds forecast for the 2030 No-Build Alternative, TSM and any Build Alternatives.

Required Data from Others

- Year 2030 System level output from the regional travel demand model (CDOT)

Presentation of Findings

- Summary of the regional impacts on travel
- Presentation of the measures of effectiveness comparison will be in tabular format

3.1.3. Changes in Mode of Travel

Changes in mode of travel that would result from implementation of the proposed LYNX Blue Line Extension will be determined by examination of regional travel demand model output. Data will be compiled and examined at the regional level for the No-Build, TSM and Build scenarios. Trips will be broken down into the following:

- Transit Trips
Work
Non-Work
Total
- Highway Trips
Work
Non-Work
Total

Required Data from Others

- Output of transit trips from the regional travel demand model (from CDOT)

Presentation of Findings

- Summary of the regional transit trips based on the data provided by CDOT

3.1.3 Changes in Travel Times between Major Activity Centers

Travel time estimates between major activity centers that would be served by the proposed transit action will be developed through the use of the regional travel demand model and transit operating plans. A list of major activity centers will also be produced, and include the following:

- Southeast Cabarrus County
- UNC Charlotte
- University City

- Central Business District
- NoDa

Required Data from Others

- Estimated travel times generated from the regional travel demand model (from CDOT)
- Approved listing of major activity centers

Presentation of Findings

- Summary of travel times between major activity centers generated from the regional model, including Drive Alone trips, Carpool/HOV, and transit trips.

3.2. Public Transportation

3.2.1. Impact on Transit Service

Based on the detailed definitions of alternatives and the operating plans used for preparing ridership forecasts, the impact of the proposed action on transit service within the study area will be defined. For the Build scenario, this will include both the implementation of the proposed LYNX Blue Line Extension and adjustments to bus service within the study area that would be required to service the proposed build action. For routes within the corridor, a description of each route will be provided that describes:

- Service area coverage
- Route alignment
- Route frequencies by time of day
- Span of service
- Fare Structure
- Peak/Fleet Bus Requirements
- Operating Statistics

Included will be maps illustrating proposed corridor transit services and coverage.

Required Data from Others

- Feeder bus operating plans for each alternative (from CATS/CDOT)

3.2.2 Impact on Transit Ridership

As described above, the impact of the TSM and Build Alternatives on transit system ridership and mode splits will be defined on a regional basis. In addition, year 2030 transit ridership forecasts for the study area will be prepared and compared. The basis for the ridership estimates will be the regional travel demand model applied by CDOT. Using model output, the following results will be reported for both the No-Build, TSM and Build scenarios:

- Daily fixed guide way ridership
- Fixed guide way station boardings and alightings
- Fixed guide way station ridership by method of access (walk or drive)

- Study area bus ridership
- Special event ridership

Required Data from Others

- Year 2030 route ridership forecasts (CDOT)

3.3 Street and Highway Impacts

3.3.1 Corridor Roadway Levels of Service

For the major roadways within and in the vicinity of the study area (the same facilities for which existing conditions levels of service are prepared), year 2030 levels of service will be estimated, using the FDOT 2002 *Generalized Level of Service Tables*. Analysis will be conducted for both the No-Build and Build scenarios. Analysis will be based on link volume forecasts provided by CDOT from the regional travel demand model. The roadway network will reflect the currently adopted MPO long range transportation plan for roadway improvements.

Required Data from Others

- Year 2030 daily roadway link forecasts (CDOT)

3.3.2 Effects on Local Roadway Operations

Analysis Locations

Local roadway operations will be based on level of service analysis at major intersections within the study area. Individual element analysis will be performed for existing or proposed (for the build alternatives) signalized intersections or major un-signalized intersections within a ¼ mile of the proposed LYNX Blue Line Extension.

The list of intersections, signalized and un-signalized, to be analyzed, are below:

3hr AM/PM Peak Turning Movement Counts & Ped Counts	Signalized or Un-signalized	Data Collection
North Tryon Street & Sugar Creek Road	S	CDOT
North Tryon Street & Old Concord Road	S	CDOT
North Tryon Street & Orr Road/Pounds Street	U	STV Team
North Tryon Street & Austin Drive	U	STV Team
North Tryon Street & Arrowhead Drive	U	STV Team
North Tryon Street & Heathway Drive	U	STV Team
Tryon Street & Owen Boulevard	U	STV Team
North Tryon Street & Tom Hunter	S	CDOT

North Tryon Street & Gloryland Avenue	U	STV Team
North Tryon Street & Orchard Trace Lane	U	STV Team
North Tryon Street & Mineral Springs Road	U	STV Team
North Tryon Street & Kemp Street	U	STV Team
North Tryon Street & Sandy Avenue (future Signalized Intersection)	U	STV Team
North Tryon Street & US-29 (future Signalized Intersection)	U	STV Team
North Tryon Street & N I-85 Service Road (future Signalized Intersection)	U	STV Team
North Tryon Street & Stetson Drive (future Signalized Intersection)	U	STV Team
North Tryon Street & Rocky River Road (future Signalized Intersection)	U	STV Team
North Tryon Street & City Boulevard (future Signalized Intersection)	U	STV Team
North Tryon Street & Brookside Lane	U	STV Team
North Tryon Street & Shopping Center Drive	U	STV Team
North Tryon Street & Clark Boulevard	U	STV Team
North Tryon Street & Hampton Church Road	U	STV Team
North Tryon Street & McCullough Drive	S	CDOT
North Tryon Street & Ken Hoffman Drive	S	CDOT
North Tryon Street & W.T. Harris Boulevard	S	CDOT
North Tryon Street & JM Keynes/Hospital Drive	S	CDOT
North Tryon Street & JW Clay Boulevard	S	CDOT
North Tryon Street & Grove Lake Drive	U	STV Team
North Tryon Street & Barton Creek Drive	U	STV Team
North Tryon Street & UNCC Research Drive	U	STV Team
North Tryon Street & Mallard Creek Church Road	S	CDOT
North Tryon Street & US-29 Access Road	U	STV Team
North Tryon Street & US-29 Service Road	U	STV Team
Davidson Street & 36 th Street	S	CDOT
Parkwood Avenue & 16th Street	U	STV Team
North Brevard Street & East 28th Street	U	STV Team
Parkwood Avenue & North Brevard Street	U	STV Team
Davidson Street & Craighead Road	U	STV Team
Davidson Street & Sugar Creek Road	U	STV Team

Craighead Road & Raleigh Street	U	STV Team
North Tryon Street & Beechway Circle	U	STV Team
North Tryon Street & Wellingford Street	U	STV Team
North Tryon Street & Dorton Street	U	STV Team
North Tryon Street & Mellow Drive	U	STV Team
North Tryon Street & Bennett Street	U	STV Team
North Tryon Street & Bingham Drive	U	STV Team
North Tryon Street & Lambeth Drive	U	STV Team
North Tryon Street & Eastway Drive	S	CDOT
North Tryon Street & Northcase Drive	U	STV Team
Sugar Creek Road & Greensboro Street/Asian Corner Entrance	S	CDOT
Eastway Drive & North Park Mall 2nd Entrance	S	CDOT
Eastway Drive & North Park Mall 1st Entrance	U	STV Team
Eastway Drive & Curtiswood Drive	U	STV Team
College Street & 12th Street	S	CDOT

In addition, analysis will be conducted of expected delay at up to four at-grade crossing locations along the corridor. Potential crossing locations will be developed and presented to CATS and CDOT for review.

Development of Design Year (2030) Peak-Hour Traffic

Local roadway operations analysis will be based on projected year 2030 peak hour traffic. Year 2030 No-Build and Build Alternative peak-hour traffic will be developed in a sequential basis, by application of a growth factor developed by comparing base year and design year No-Build screenline traffic volumes to existing traffic counts, as follows:

- Recent a.m. and p.m. peak hour signalized intersection turning movement provided by CDOT and un-signalized intersection turning movement will be conducted and normalized for the 2007 base year.
- Year 2030 No-Build traffic will be developed by applying 2008-2030 growth factors to base year intersection movement counts. Growth factors will be developed by comparison of roadway link volumes drawn from base year and year 2030 No-Build traffic forecasts. Growth factors will be derived by comparing summed link volumes across one or more screenlines that capture all major roadways within and immediately adjacent to the study area.
- Year 2030 Build scenario traffic will be developed by preparing manual reassignments of traffic diverted from proposed grade-crossing closures, plus traffic anticipated to be accessing transit park-and-ride lots (based on “drive-to-transit” data generated from the

transit ridership forecasts). For both diverted traffic and station-access traffic, adjustment will be made on a case-by-case basis, with examination of the roadway network in the vicinity of the crossing or station, and application of general rules for auto occupancy, ratio of peak to daily traffic, and peak directionality. For the drive-to-transit portion of the build traffic, the following assumptions, consistent with the procedures contained in NCHRP Report 187, will be used:

- Auto occupancy: 1.1 persons per auto
- Peak-to-daily ratio: 50% of daily drive-to-transit ins and outs will occur in the peak hour
- Peak-hour/peak-direction: 82% of peak hour traffic will be moving in the peak direction
- Generally, no more the 1/3 of riders will back-track to get to stations

Intersection Analysis Approach

Utilizing the design hour volumes that are developed as defined above, the following methodology will be applied for both No-Build and Build scenarios, for all defined analysis locations.

- Intersection capacity analyses are to be performed for both a.m. and p.m. peak hours at specified intersections along the corridors. Intersection analysis will be performed using Synchro, version 7.0 and V/C ratios shall be reported for both peak hour traffic conditions.
- For intersections with overall intersection v/c ratios less than 0.95 for both peak hours (existing and future conditions), no further analysis is necessary. For intersections with overall v/c ratios equal to or exceeding 0.95 in either the a.m. or p.m. peak hour (existing and future conditions), an extended period of analysis will be performed to determine the extent of congestion. The maximum number of hours to be evaluated will not exceed six hours (three a.m. peak hours and three p.m. peak hours). Analyses will be performed in 15 minute volume increments. The 15 minute volumes are to be inflated to hourly conditions by dividing the volumes by a peak hour factor of 0.25. CDOT will provide volume files that can be imported directly into Synchro 7 for use in these analyses.
- For intersections with v/c ratios over 100%, the duration of congestion will be documented. In addition, movements causing the intersection to be over capacity will be identified.

Existing year 2008 roadway geometry conditions will be the basis for the analysis, as determined from recent field verified aerial photography. Intersection improvements consistent with planned and programmed roadway improvements will be developed, to provide intersection geometry (number of through and turning lanes) for design year analysis.

For signalized intersections, existing traffic signal timings, obtained from the City of Charlotte, will be used to perform the intersection analysis. Existing coordination plans and time of day plans will be obtained for the a.m. and p.m. peak hours. Existing signal timings will be adjusted to accommodate future traffic and geometry conditions.

For un-signalized intersections, 2008 intersection counts will be performed. Existing intersection control will be analyzed unless the intersection operates with unacceptable levels of service by the year 2030 and meets the peak hour traffic signal warrant for signalization. In that case, the intersection will be analyzed as signalized.

A corridor-wide peak hour factor and heavy vehicle factor will be developed for the a.m. and p.m. peak hours. These factors will be determined from historical peak hour turning movement counts and AADT tube counts.

Pedestrian and bicycle Level of Service analysis will be performed for signalized intersections analyzed for traffic levels of service. The analysis will be performed following the City of Charlotte's Pedestrian and Bicycle Level of Service methodology.

Required Data from Others

- Recent intersection a.m. and p.m. peak hour turning movement counts for all intersections to be analyzed (from CDOT and STV Team)
- Any tube counts on roadways within the study area (from NCDOT and CDOT)
- Traffic signal timings for all intersections to be analyzed (from CDOT –if within Charlotte, from NCDOT or from outside sources)
- Year 2030 No-Build AAWT volumes from the MUMPO regional model for all roadways within the project study area (from CDOT)
- Year 2030 build AAWT volumes for both build alternatives from the MUMPO regional model for all roadways within the project study area (from CDOT)
- Transit headways (from CATS) for use in the at-grade transit crossing system analysis

Presentation of Findings

Documentation for each scenario will include the following items:

- Summary of the year 2030 forecast model output and determination of a.m. and p.m. peak hour turning movement volumes
- Summary of the intersection individual element analysis
- Intersection analysis forms from HCS, Synchro 7, and ICU spreadsheets
- Figures presenting intersection lane configurations and traffic control, a.m. and p.m. peak hour intersection turning movement volumes, and peak hour intersection levels of service and v/c ratios
- Summary of pedestrian and bicycle Level of Service analysis

3.3.3 Traffic Conditions Analysis – At-Grade Crossing Analysis

The VISSIM analysis will evaluate the operation of the LYNX Blue Line Extension along North Tryon Street for the NCCR alignment, as well as the Sugar Creek alignment. The analysis will also evaluate the operation of LRT along the corridor wherever at-grade transit crossings with adjacent intersections occur. The evaluation and analysis along North Tryon Street and all at-grade crossing

locations will be performed using VISSIM, version 4.3. The No-Build and Build Alternatives a.m. and p.m. peak hour conditions will be evaluated using peak hour traffic volumes calculated for the individual element analysis.

The No-Build conditions analysis will be based on the No-Build intersection geometry and traffic control. This analysis will be used as a base case against which to compare the build alternatives. Appropriate transit headways, provided by CATS, will be used in the VISSIM model and system wide measures of effectiveness such as total network delay, travel time and total stops will be calculated for the Build alternatives.

Required Data from Others

- Transit headways (from CATS)

Presentation of Findings

- Documentation of the at-grade crossing analysis methodology
- Presentation of the VISSIM results in tabular format
- VISSIM Simulation animation files in .avi format

3.3.4 Bikeways and Major Pedestrian Ways

This section will present how bikeways and pedestrian ways will be integrated into the station area planning process. This information will be obtained from the Station Area planning documents to be prepared by CATS Land Use/Station Area planning consultants. Evaluation will compare the degree to which bicycle and pedestrian movement within the study area is either enhanced by or restricted by the Build scenario.

Presentation of Findings

- Brief summary of bicycle and pedestrian facilities proposed as part of the station area plans based on the documentation provided by the Land Use/Station Area Planning consultants.

3.4 Impacts on Railroad Operations

3.4.1 Freight Rail

No-Build conditions will analyze additional impacts on freight operations without improvements to the transportation network. A summary of the additional impacts will be compiled.

For the build condition, analysis will comprise of new and enhanced impacts created by the transit mode and alignment on the freight operations.

Presentation of Findings

- Documentation of the direct and indirect impacts on freight service

3.4.2 Passenger Rail

No-Build conditions will analyze additional impacts on passenger operations without improvements to the transportation network. A summary of the additional impacts will be compiled.

For the Build condition, analysis will comprise of new and enhanced impacts created by the transit mode and alignment on the passenger operations.

Presentation of Findings

- Documentation of the direct and indirect impacts on passenger service

4. Mitigation Plan

4.1. Corridor Level

This section will describe both the existing and build LOS analyses along the proposed LYNX Blue Line Extension project corridor, and detail the effects of both construction and operation of rapid transit on vehicular, bicycle and pedestrian traffic circulation, and access and parking on the street system and any parallel networks. Measures to mitigate adverse effects by modification of the roadwork or features incorporated in the running ways for the transit system will be developed and outlined with examples of their application in other comparable corridors or systems.

Presentation of Findings

- Summary of impacts created due to transit system construction and operation including any modification of traffic or pedestrian circulation and access to adjacent streets and properties along with an outline of typical measures to mitigate representative examples of situations where conditions in the Build alternative would be considered unacceptable.

4.2 Station Area

This section will describe the existing connection of commercial, residential and industrial uses to the thoroughfare and transit network. Since certain parcels and land uses could have access cut-off or minimized, a detailed analysis of impacts resulting from project construction, traffic circulation, access, and operations will be conducted. Mitigation measures to address project impacts will be described.

Presentation of Findings

- Summary of impacts resulting from construction, traffic circulation, access, and operations of the project and mitigation measures based on solutions and tools used in other corridors and projects.