



**LYNX Blue Line Extension
(Northeast Corridor)
Light Rail Project
Contract #: 08-477
WBS #: 6.11**

Air Quality Technical Report

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1.0 INTRODUCTION

STV/Ralph Whitehead Associates, under contract with the City of Charlotte, examined the potential air quality changes associated with the proposed extension of the LYNX Blue Line Extension Northeast Corridor Light Rail Project (LYNX BLE).

1.1 Project Description

The proposed project would extend the existing LYNX Blue Line light rail system by approximately 10.6 miles and provide 13 transit stations, including six walk-up stations and seven park-and-ride facilities. The proposed Light Rail Alternative alignment, shown in Figure 1, would begin at the existing LYNX 7th Street Station and travel along CATS-owned right-of-way until approximately 12th Street where it would cross over the CSX rail tracks and then enter the existing Norfolk Southern and North Carolina Railroad (railroad) rights-of-way to the middle of the alignment, near Old Concord Road, where it would then transition into the median of North Tryon Street/US-29. The line would remain in the median until north of W.T. Harris Boulevard, where it would turn east crossing under the existing travel lanes of North Tryon Street/US-29, entering the UNC Charlotte campus before returning to the east side of North Tryon Street/US-29 to a terminus just south of I-485.

The project would be designed to accommodate two light rail tracks, one for northbound service and one for southbound service. In general, the tracks would be located at-grade. Some portions would be elevated to travel over existing freight tracks, water features or roads. The proposed Light Rail Alternative would include the depression of 36th Street under the existing railroad freight tracks and the proposed light rail tracks. Sugar Creek Road would be depressed under the existing railroad tracks as planned and undertaken as a separate project by the railroad. A structure specifically for light rail use would be constructed over a depressed Sugar Creek Road. A depression of the light rail tracks under the existing northbound travel lanes of North Tryon Street/US-29 would also occur where the alignment turns southeast to enter the UNC Charlotte campus.

The proposed project would include local, neighborhood circulator and express bus services to connect the light rail service with the CATS regional bus system, as well as any ancillary facilities such as traction power substations, signal houses, and crossing cases. Also included in the project is a Vehicle Light Maintenance Facility (VLMF) for light maintenance and vehicle storage.

Along North Tryon Street/US-29 north of Old Concord Road, where the proposed alignment would be in the median, station platforms would be located in the median with pedestrian access via crosswalks. All stations would include facilities for bicyclists, such as bike racks or bike lockers, shelters, lighting, benches, garbage cans, self-serve ticket-vending machines and CATS customer information, such as maps and schedules for the light rail line and any connecting bus routes. Seven stations would include park-and-ride facilities, providing over 4,000 parking spaces. The park-and-ride facility at the Sugar Creek Station under Sugar Creek Design Option 2 would include two four-story parking garages while the terminal station located at I-485 would include a five-story parking garage.

A design option for the proposed Light Rail Alternative, called the Light Rail Alternative – Sugar Creek Design Option, is also being studied in the Draft EIS and is discussed in this technical

report. The Sugar Creek Design Option alignment enters the median of North Tryon Street/US-29 in the vicinity of Sugar Creek Road approximately 500 feet before the Light Rail Alternative alignment. This design option includes park-and-ride facilities at a Sugar Creek Station and at Old Concord Road Station that are in different locations than those proposed for the Light Rail Alternative.

1.2 Alternatives Considered in the Draft EIS

The alternatives to be evaluated in the LYNX Blue Line Extension Draft EIS include:

- The No-Build Alternative, in which no changes to transportation service or facilities would be implemented in the corridor beyond already committed transportation projects;
- The TSM Alternative, in which low-to-medium cost improvements to the operations of the CATS local bus service would be implemented, in addition to the currently planned transit improvements in the corridor. Should this alternative be selected for implementation, it would be evaluated in separate environmental documentation; and,
- The Light Rail Alternative, in which light rail would be constructed between Center City Charlotte and I-485 near the Mecklenburg-Cabarrus County line, primarily using existing railroad right-of-way and North Tryon Street/US-29.

2.0 METHODOLOGY

An air quality analysis was performed to estimate the maximum localized 1-hour and 8-hour carbon monoxide (CO) concentrations caused by vehicular traffic associated with the No-Build and Light Rail Alternatives. An air quality analysis of the TSM Alternative was not completed as part of this analysis, since this alternative would be analyzed in separate documentation if selected for implementation. Concentrations of CO were determined in accordance with the guidance documents and regulations listed below.

2.1 Microscale Air Quality Guidance

Guidance in the following documents was used for microscale carbon monoxide modeling for various intersections and proposed parking facilities within the project study area.

- NC 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.

2.2 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) aided in the analysis of parking facilities.

2.2.1 MOBILE6.2 Emission Factors

The MOBILE6.2 emission factor model was used to provide input to the microscale model (CAL3QHC Version 2.0) and the PAL model for estimating CO concentrations along roadways and at parking facilities. According to 40 CFR Part 51, Appendix W, Section 5.2.3, the latest version of the MOBILE model should be used for emissions input to intersection models. MOBILE6.2 is the latest update to the MOBILE model for use by state and local governments to meet Clean Air Act requirements. 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 Blue Line Extension Northeast Corridor Light Rail Project. Input and assistance from the Mecklenburg County LUESA Air Quality Section was necessary to determine the emissions factors and to confirm use of MOBILE6.2 for this project-level hot-spot analysis.

The MOBILE6.2 input and output files used to generate the various emission factors for 2008 and 2030 are included in Appendix A. The emission factors by roadway type for 2008 can be found in Table 2-1 and Table 2-2. In Table 2-2, the CO emission factors are listed for warm and cold starts, which were necessary for CAL3QHC Version 2.0 and PAL input, respectively.

**Table 2-1
CO Emission Factors from MOBILE6.2**

Road Type-Mecklenburg County	2008 CO Emission Factors	
	(g/mi) ¹	(mph) ²
Urban freeway	9.567	55
Urban principal arterial	8.448	35
Urban minor arterial	8.441	35
Urban collector	8.381	30
Urban local	8.496	25
Road Type-Mecklenburg County	2030 CO Emission Factors	
	(g/mi)	(mph)
Urban freeway	4.996	55
Urban principal arterial	4.438	35
Urban minor arterial	4.431	35
Urban collector	4.448	30
Urban local	4.518	25

¹ g/mi (grams per mile traveled)

² mph (miles traveled per hour)

**Table 2-2
Hot and Cold Start CO Emission Factors from MOBILE6.2**

2008	CO Emission Factors (Warm)			CO Emission Factors (Cold)		
Road Type	g/mi ¹ @ 2.5 mph ²	g/mi @ 5 mph	Idle- g/hr	g/mi @ 2.5 mph	g/mi @ 5 mph	Idle-g/hr ³
Urban freeway	22.30	12.76	55.75	28.54	19.00	71.34
Urban principal arterial	22.93	12.90	57.31	29.58	19.55	73.94
Urban minor arterial	22.97	12.95	57.41	29.59	19.58	73.98
Urban collector	23.14	13.06	57.85	29.77	19.69	74.43
Urban local	23.41	13.34	58.51	29.89	19.82	74.73
2030	CO Emission Factors (Warm)			CO Emission Factors (Cold)		
Road Type	g/mi @ 2.5 mph	g/mi @ 5 mph	Idle- g/hr	g/mi @ 2.5 mph	g/mi @ 5 mph	Idle-g/hr
Urban freeway	11.71	6.88	29.27	15.05	10.22	37.61
Urban principal arterial	12.17	7.06	30.43	15.73	10.62	39.33
Urban minor arterial	12.18	7.08	30.46	15.73	10.63	39.32
Urban collector	12.37	7.19	30.91	15.92	10.74	39.79
Urban local	12.48	7.27	31.20	15.95	10.75	39.88

¹ g/mi - (grams per mile traveled)

² mph - (miles traveled per hour)

³ g/hr - (grams emitted per hour)

2.2.2 CAL3QHC Version 2.0 Microscale Modeling Methodology

2.2.2.1 Modeling Procedure

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 input variables include: calculated free flow and idle emission factors, roadway geometries, traffic volumes, site characteristics, background pollutant concentrations, signal timing, and meteorological conditions. CAL3QHC Version 2.0 predicts inert pollutant concentrations, averaged over a 1-hour period near roadways. This model was used to predict concentrations at the identified affected study area intersections.

The use of peak hour baseline and project-generated traffic conditions would also result in conservative predictions of pollutant levels and project impacts. Peak hour traffic represents the highest hourly traffic during the study period.

CAL3QHC Version 2.0 was used to model study area intersections for the existing condition (2008) and the expected Build year of the project (2030). The results were compared to the 1-hour and 8-hour NAAQS for CO to determine whether the receptors would experience air quality impacts. The existing maximum CO concentrations at each modeled intersection are listed in Table 4-1.

2.2.2.2 Roadway Intersection Selection

The following process, consistent with the *Guidelines for Modeling Carbon Monoxide from Roadway Intersections* (EPA, 1992), was used to identify appropriate intersections to be modeled within the project study areas. The steps, as defined in the regulation, are as follows:

Step 1: Intersections projected to experience changes in traffic volumes in 2030 as a result of project implementation (2030 Light Rail Build Alternative) were identified.

Step 2: Results of the traffic operations analysis were analyzed to select the intersections to be modeled in the microscale air quality analysis. Intersections selected using the screening procedure described below:

- Initially, the three intersections with the highest traffic volumes were modeled for the Build Alternative in 2030 (design year).
- Then, the three intersections with the worst traffic level of service (LOS) and highest traffic delay were modeled for the Build Alternative in 2030 (design year).
- Finally, intersections proposed to have major modifications were modeled if the capacity analyses predicted they would operate at LOS D (heavy delay) or worse. Major intersection modifications would be a result of increased volumes of traffic or construction related to a new project in the vicinity.

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 each of the project alternatives as well as the Light Rail Alternative – Sugar Creek Design Option. The results of this analysis are included in Appendix B. Based upon review of the capacity screening analyses and the interagency consultation process, Table 2-3 and Figure 2 illustrates the intersections that were identified for modeling using CAL3QHC Version 2.0 for 2008 and 2030.

**Table 2-3
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.

2.2.2.3 Traffic Volumes

The traffic volumes and LOS analysis for the intersections identified for modeling are included in Appendix C. The LOS analysis includes the corresponding Synchro output files for the modeled intersections. Synchro is a software program used to optimize signal timing and offsets along a traffic corridor.

2.2.2.4 Modeled Receptors

For each of the air quality intersections selected for detailed study, receptor locations were identified in accordance with the *Guidelines for Modeling Carbon Monoxide from Roadway Intersections* (EPA, 1992). The following criteria, as defined in the guidance, were used to select receptors:

- Receptors must be at least ten feet from each of the traveled roadways that comprise the intersection and must be at a height of six feet; these criteria generally apply to all receptors, with further refinements listed below.
- Receptors nearby occupied lots must be located along the nearest edge within the lot to which the general public has continuous access. If this cannot be determined, the property line of the lot nearest to traffic lanes should be used.
- Receptors nearby vacant lots must be located using the same criteria for receptors near occupied lots.
- For sidewalks, receptors should be located at least ten feet from each of the traveled roadways that comprise the intersection. If the width of the sidewalk allows, it is recommended that receptors be placed at the midpoint between the curb and the building line. At a minimum, receptors should be located near the corner and at midblock for each approach and departure at the intersection. Receptors should be placed on both sides of the road. For long approaches, it is recommended that receptors be located 80 feet and 160 feet from the intersection corner.
- Receptors (any location type) near breathing height (six feet) to which the general public has continuous access.

2.2.2.5 Background Concentrations and Persistence Factors

For the project study area, the latest background hourly average CO concentration and the persistence factor to be used for modeling purposes were provided by the Mecklenburg County LUESA Air Quality Section. The use of these background concentrations represents a worst-case scenario that conservatively results in the highest predicted 1-hour CO concentration. The background concentration provided by the LUESA was 1.1 parts per million (ppm) for 1-hour averages and 0.912 ppm for 8-hour averages. The persistence factor used was 0.83.

2.2.2.6 Other CAL3QHC Version 2.0 Model Input

Table 2-4 details the CAL3QHC Version 2.0 inputs that were used to predict CO concentrations for this project. Appendix D includes the CAL3QHC Version 2.0 input and output files for the 2008 and 2030 intersection CO analysis as well as the sketch for each modeled intersection.

**Table 2-4
CAL3QHC Version 2.0 Model Inputs**

Meteorological Variables	Unit of Measurement
Settling/Deposition Velocities	0/0 centimeters per second (cm/sec)
Surface Roughness (Zo)	175 cm (urban area)
Wind Speed (U)	1.0 meters per second (m/sec)
Averaging Time (ATIM)	60 minutes
Mixing Height	1,000 m
Ambient Concentrations	1.1 ppm
Stability Class	D
Site Variables	Receptor Location
Receptor Height:	6 feet
Receptor Locations	various locations in all four quadrants
Links	Most links at-grade; links on structures and depressed links were modeled as required. Approach and departure free-flow links. Left-turn, right-turn, and through queue links.
Traffic Variables	Unit of Measurement
Traffic Speed	Various
Traffic volumes	Projected 2030 a.m. and/or p.m. peak traffic volumes and turning movements

2.2.3 PAL Modeling Methodology

2.2.3.1 Parking Facilities Requiring Modeling

The proposed parking lots and garages were analyzed in accordance with Mecklenburg County Air Pollution Control Ordinance (MCAPCO) and the *Guidelines for Evaluating the Air Quality Impacts of Transportation Facilities* (EPA, 1992). As outlined in these guidance documents, the PAL algorithm was used to model carbon monoxide concentrations under worst case conditions at proposed parking lots and garages

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 will be sought from Mecklenburg County LUESA Air Quality Section as the project design advances and parking spaces and station site plans are finalized.

2.2.3.2 Selection of Parking Facilities to be Modeled

Under the No-Build Alternative, there would not be any additional parking facilities built. The TSM Alternative would be evaluated in separate environmental documentation, should this alternative be selected for implementation. Therefore, no further parking lot analyses would be required for the No-Build and TSM Alternatives.

Under the Light Rail Alternative, the Sugar Creek Station Option 2 and the I-485/N. Tryon Station parking garages are the only two of the seven proposed park-and-ride lots anticipated to exceed the criteria defined by MCAPCO. The proposed Sugar Creek Station Option 2 parking garage is estimated to have a maximum of 1,300 spaces and the proposed I-485/N. Tryon Station parking garage is estimated to have a maximum of 2,134 spaces. Therefore, a Transportation Facilities Construction Permit would be required from the Mecklenburg County LUESA Air Quality Section. As a result, these parking garages required modeling using the EPA's PAL model for parking facilities.

Table 2-5 is a complete listing of the seven stations with park-and-ride facilities and the corresponding estimated number of parking spaces based on 30 percent preliminary engineering concepts as of December 9, 2009. For purposes of this analysis, a worst-case assumption was used for the parking garages and is shown in parenthesis in Tables 2-5, 2-6 and 2-7. The worst-case scenario demonstrates the number of spaces if the maximum allowable parking spaces and maximum available square footage are used. Using the maximum amount of parking spaces and square footage will produce a worst case pollutant concentration since the emissions are a direct result of the number of cars idling and traveling in the garage. If this worst case scenario does not violate any state or federal air quality standard, then any lesser amount of vehicles will not violate any air quality standard either.

Table 2-5
Proposed Station Park-and-Ride Facilities

Proposed Station	Number of Parking Spaces (worst-case assumption)	Square Feet (approximate) (worst-case assumption)
Sugar Creek Station Option 1, Light Rail Alternative	897	179,400
Sugar Creek Station Option 2, Light Rail Alternative	1,040 (1,300)	208,000 (450,000)
Sugar Creek Station, Sugar Creek Design Option	893	178,600
Old Concord Road Station, Light Rail Alternative	548	109,600
Old Concord Road Station, Sugar Creek Design Option	458	91,600
Tom Hunter Station	143	28,600
University City Blvd. Station	774	154,800
McCullough Station	155	31,000
Mallard Creek Church Station	160	32,000
I-485/N. Tryon Station	2,002 (2,134)	400,400 (664,500)
TOTAL, Light Rail Alternative with Sugar Creek Station Option 1	4,686 (4,820)	937,200 (1,476,300)
TOTAL, Light Rail Alternative with Sugar Creek Station Option 2	4,829 (5,214)	965,800 (1,470,500)
TOTAL, Light Rail Alternative with Sugar Creek Design Option	4,577 (4,717)	915,400 (1,181,100)

2.2.3.3 PAL Model Input

The PAL model inputs that were used to predict CO concentrations for the proposed parking garages at the Sugar Creek Station Option 2 and the I-485/N. Tryon Station are shown in Table 2-6 and 2-7, respectively. A worst-case scenario demonstrates the number of spaces if the maximum allowable parking spaces and maximum available square footage are used. The proposed parking garages would have entrances/exits on the ground floor for the Sugar Creek Station Option 2 and on the ground and third floors for the I-485/N. Tryon Station

**Table 2-6
PAL Model Inputs for the
Proposed Sugar Creek Station Option 2¹**

Parking Lot Configuration	
Number of Levels:	Five levels per structure (2 structures, 10 levels total)
Spaces per Level:	130 spaces per level (worst-case assumption)
Total Spaces:	650 spaces per structure (1300 spaces total, worst-case assumption)
Dimensions:	250 feet x 180 feet per structure
Area:	4,181 square meters per level per structure
Emission Factors	
Roadway Line Source:	0.001206 g-sec-m*
Parking Level 1:	0.00001025 g-sec-m ^{2**}
Parking Level 2:	0.00002050 g-sec-m ^{2**}
Parking Level 3:	0.00005127 g-sec-m ^{2**}
Parking Level 4:	0.00002050 g-sec-m ^{2**}
Parking Level 5:	0.00001025 g-sec-m ^{2**}
Traffic Variables	
Traffic Speed:	Various
Traffic volumes:	Projected 2030 a.m. traffic volumes and turning movements. 2030 p.m. (worst-case assumption) 1,300 vehicles total (0 entering/ 1300 exiting in cold start mode)

*grams per second per meter (g-sec-m)

**grams per second per meter squared (g-sec-m²)

¹ Parking garage analysis done based on worst case scenario estimates as opposed to 30% design plan estimates

**Table 2-7
PAL Model Inputs for the
Proposed I-485/N. Tryon Station**

Parking Lot Configuration	
Number of Levels:	Five levels
Spaces per Level:	408 spaces per level (worst-case assumption)
Total Spaces:	2,134 spaces (worst-case assumption)
Dimensions:	300 feet x 443 feet
Area:	12,347 square meters per level (61,734 total)
Emission Factors	
Roadway Line Source:	0.00189 g-sec-m*
Parking Level 1:	0.0000083 g-sec-m ^{2**}
Parking Level 2:	0.0000042 g-sec-m ^{2**}
Parking Level 3:	0.0000199 g-sec-m ^{2**}
Parking Level 4:	0.0000083 g-sec-m ^{2**}
Parking Level 5:	0.0000042 g-sec-m ^{2**}
Traffic Variables	
Traffic Speed:	Various
Traffic volumes:	Projected 2030 a.m. traffic volumes and turning movements. 2030 p.m. (worst-case assumption) 1,067 vehicles total (0 entering/1067 exiting in cold start mode)

*grams per second per meter (g-sec-m)

**grams per second per meter squared (g-sec-m²)

3.0 AFFECTED ENVIRONMENT

This section discusses the National Ambient Air Quality Standards (NAAQS), existing air quality and NAAQS compliance, air quality monitoring sites in Mecklenburg County, and NAAQS compliance for the six criteria pollutants.

3.1 National Ambient Air Quality Standards

The federal Clean Air Act (CAA) of 1970 and 1990, as amended (42 USC Sections 7401-7671q), 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 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 Environmental Protection Agency (EPA) established primary and secondary NAAQS for six air pollutants: CO, nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone (O₃), particulate matter (PM), and lead (Pb). For ozone, North Carolina adopted the national 8-hour standard on April 1, 1999. The most recent NAAQS were obtained from EPA's website and are listed in Table 3-1.

On July 17, 1997, the EPA announced new NAAQS for ground level ozone and PM. For ozone, a new 8-hour standard of 0.08 parts per million (ppm) replaced the existing 1-hour standard of 0.12 ppm. On June 15, 2005, the 1-hour ozone standard was revoked for all areas except the 8-

hour ozone non-attainment Early Action Compact Areas (EAC) areas (those do not yet have an effective date for their 8-hour designations). This happened by virtue of 40 CFR 50.9(b). Charlotte is not one of the EAC areas for which the standard was revoked. On May 27, 2008, the EPA announced a new NAAQS for ground level ozone. The new 8-hour standard was set at 0.075 ppm. The 1997 standard of 0.08 ppm remains in place until the EPA undertakes rulemaking to address the change to the 2008 standard.

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 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.

For PM, the EPA revised the primary standards by adding a new annual particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$) standard set at 15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and a new 24-hour standard set at 35 $\mu\text{g}/\text{m}^3$. Current particulate matter less than 10 micrometers in diameter (PM_{10}) standards will remain, but the format of the standard will be modified slightly. Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the EPA revoked the annual PM_{10} standard. Secondary PM standards will be identical to the new primary standards.

**Table 3-1
National Ambient Air Quality Standards (NAAQS)**

Pollutant	Standard Value [parts per million (ppm); micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)]		Standard Type
Carbon Monoxide (CO)			
8-hour Average ¹	9 ppm	(10 $\mu\text{g}/\text{m}^3$)	Primary
1-hour Average ¹	35 ppm	(40 $\mu\text{g}/\text{m}^3$)	Primary
Nitrogen Dioxide (NO₂)			
Annual Arithmetic Mean	.053 ppm	(100 $\mu\text{g}/\text{m}^3$)	Primary & Secondary
Ozone (O₃)			
1-hour Average ^{1,6}	.12 ppm	(235 $\mu\text{g}/\text{m}^3$)	Primary & Secondary
8-hour Average ⁵	.075 ppm	(235 $\mu\text{g}/\text{m}^3$)	Primary & Secondary
Lead (Pb)			
Quarterly Average	.15 $\mu\text{g}/\text{m}^3$		Primary & Secondary
Particulate (PM₁₀)			
Annual Arithmetic Mean	(Revoked) ²		Primary & Secondary
24-hour Average ¹	(150 $\mu\text{g}/\text{m}^3$)		Primary & Secondary
Particulate (PM_{2.5})			
Annual Arithmetic Mean ³	(15 $\mu\text{g}/\text{m}^3$)		Primary & Secondary
24-hour Average ⁴	(35 $\mu\text{g}/\text{m}^3$)		Primary & Secondary

**Table 3-1 (continued)
National Ambient Air Quality Standards (NAAQS)**

Pollutant	Standard Value [parts per million (ppm); micrograms per cubic meter ($\mu\text{g}/\text{m}^3$)]		Standard Type
Sulfur Dioxide (SO₂)			
Annual Arithmetic Mean	.03 ppm	(80 $\mu\text{g}/\text{m}^3$)	Primary
24-hour Average ¹	.14 ppm	(365 $\mu\text{g}/\text{m}^3$)	Primary
3-hour Average ¹	.50 ppm	(1300 $\mu\text{g}/\text{m}^3$)	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 $\mu\text{g}/\text{m}^3$ ⁴ -3 year average of 98th percentile of 24-hour concentrations at each monitor within an area must not exceed 35 $\mu\text{g}/\text{m}^3$ 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.			

3.2 Existing Air Quality Designation and NAAQS Compliance

The EPA website was accessed to determine NAAQS compliance for the project corridor. The Charlotte-Gastonia-Rock Hill area currently is classified by the EPA as an attainment area for CO, O₃ (1-hour average), NO₂, SO₂, PM₁₀, PM_{2.5}, and Pb. Mecklenburg County is classified (as of November 29, 2004) as a maintenance area (not classified) for CO.

The “Charlotte-Gastonia-Rock Hill, NC-SC” area is the name of the present eight-county non-attainment area for O₃ (8-hour average), meaning the area exceeded the NAAQS in 2004. In accordance with 40 CFR 93.116, an “FHWA/FTA project must not cause or contribute to any new localized CO or 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.”

The Charlotte area is currently classified by the EPA as an attainment area for NO₂, SO₂, PM₁₀, and Pb. In 1995, the Charlotte area was re-designated by the EPA as an attainment area for ozone (1-hour average) and carbon monoxide.

As documented in the *State of the Environment 2008 Report*, one-hour ozone concentrations remained relatively flat and just above the 1-hour NAAQS over the period from 2003 – 2007. The 8-hour O₃ concentrations have remained relatively consistent over the period from 1987 – 2007. In Mecklenburg County for 2007, 8-hour O₃ concentrations were measured at 0.093 ppm, which is above the 8-hour NAAQS with 19 exceedance days (Mecklenburg County, 2008).

The EPA adopted a new standard for fine particles PM_{2.5} in 1997 and set February 17, 2004 as the deadline for states to recommend which areas in their states should be designated in non-

attainment under the new fine particle standard. The EPA sets non-attainment boundaries based in part on recommendations from the states. The designations have important implications for growth and development because areas that do not meet the attainment status are not eligible for federal funding for important transportation projects.

According to the *State of the Environment 2008 Report*, the PM_{2.5} concentration used to determine compliance with the annual NAAQS for Mecklenburg County in 2007 was just below the annual standard (15 µg/m³) at 14.9 µg/m³. Annual mean PM_{2.5} concentrations measured in Mecklenburg County remain very close to the annual standard. The 24-hour PM_{2.5} NAAQS is 65 µg/m³. The PM_{2.5} concentration used to determine compliance with the 24 hour NAAQS for Mecklenburg County in 2007 was below the standard (65 µg/m³) at 31 µg/m³ (Mecklenburg County, 2008). If non-attainment designations take effect in the near future, the state and local governments have three years to develop implementation plans designed to meet the standards by reducing air pollutant emissions contributing to fine particle concentrations.

Average PM₁₀ concentrations measured at monitoring sites operating in Mecklenburg County from 2003 – 2007 demonstrated compliance with the NAAQS. Additional monitoring conducted for concentrations of SO₂, CO, and NO₂ measured at monitoring sites in Mecklenburg County register compliance with the NAAQS for each of these pollutants (Mecklenburg County, 2008).

3.3 Local Air Quality Monitoring Sites

Each year, air quality data is collected from monitoring sites located in Mecklenburg County. Measurements taken at these monitoring stations provide the data necessary to make comparisons to the NAAQS.

According to the Mecklenburg County Air Quality LUESA website, there are seven air quality monitoring sites in Mecklenburg County that monitor one or more pollutants. The sites closest to the project area and pollutant concentrations monitored are summarized in Table 3-2.

**Table 3-2
Representative Ambient Air Quality Data (2006)**

Pollutant	Monitor	Averaging Time	Value	NAAQS
Ozone	Garinger High School	8-hour	.103 ppm*	.08 ppm
CO	Garinger High School	8-hour	2.3 ppm	9 ppm
		1-hour	3.6 ppm	35 ppm
NO ₂	Garinger High School	Annual	N/A	0.053 ppm
PM ₁₀	Fire Station #11	Annual (revoked)	25.5 µg/m ³	50 µg/m ³
		24-hour	47.0 µg/m ³	150 µg/m ³
PM _{2.5}	Garinger High School	Annual	14.6 µg/m ³	15 µg/m ³
		24-hour	35.8 µg/m ³ *	35 µg/m ³
SO ₂	Garinger High School	3-hour	.0071 ppm	0.50 ppm
		24-hour	.0017 ppm	0.14 ppm (365)
		Annual	.0003 ppm	0.03 ppm

*exceedance of NAAQS

Source: EPA Air Quality Data 2006 values

3.4 Long Range Transportation Planning and Regional Air Quality Conformity

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. The process of ensuring that a region’s transportation planning activities contribute to attainment of the NAAQS, or “conform” to the purposes of the State Implementation Plan (SIP), is referred to as transportation conformity. In order to receive federal transportation funds within the non-attainment 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, as part of the Mecklenburg-Union Metropolitan Planning Organization (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 Transportation Equity Act for the 21st Century (TEA-21)).

Project level conformity determinations are made on entire projects as defined by the National Environmental Policy Act (NEPA). The EPA’s transportation conformity rule (revised May 11, 2000) defines a highway project to consist of all required phases necessary for implementation. On July 1, 2004, the EPA published a final rule in the Federal Register to amend the transportation conformity rule to include criteria and procedures for the new 8-hour ozone and fine particulate matter (PM_{2.5}) NAAQS standards.

In North Carolina, the North Carolina Department of Environment and Natural Resources, Division of Air Quality (DAQ) develops the State Implementation Plan (SIP), which is the document that describes how North Carolina will maintain or achieve compliance with the NAAQS. Both the CAA and TEA-21 require conformity between a proposed transportation system and the SIP. The transportation conformity regulations are intended to ensure that a state does not undertake federally funded or approved transportation projects, programs, or plans that are inconsistent with the state’s obligation to meet and maintain the NAAQS. Metropolitan Planning Organizations (MPOs) must show 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 transportation plans/programs must conform to the SIP.

The 2030 LRTP sets forth the metropolitan area’s long range (20-year) plan for providing intermodal mobility to its citizens. The plan is based on projected population and employment information for the planning horizon. It integrates all components of surface transportation (e.g. roads, transit, bicyclist and pedestrian provisions, as well as freight movement).

4.0 CONSEQUENCES

This section discusses the existing air quality conditions, the future No-Build scenario, and the probable air quality effects of the Light Rail Alternative. Measures to mitigate adverse effects are also discussed.

4.1 Environmental Impacts and Benefits

The following sections describe the results of the air quality assessment for the existing, No-Build, TSM and Light Rail Alternative. Where applicable, traffic volume and other differences in input data are described.

4.1.1 Existing Conditions (2008)

The results of the mobile source air quality modeling analysis under existing conditions (2008) are provided in Table 4-1. The values shown are the maximum CO concentrations estimated near each intersection during the peak traffic period. As shown in Table 4-1, no violations of the 1-hour or 8-hour NAAQS for CO are estimated to occur under existing conditions.

**Table 4-1
Existing Maximum Carbon Monoxide Concentrations at Intersections (2008)**

Intersection	Maximum CO Concentration (ppm)		Location of Maximum CO Concentration
	1-Hour Average NAAQS – 35ppm	8-Hour Average NAAQS – 9ppm	
North Tryon Street/US-29 & Sugar Creek Road	3.9	3.2	Receptor 14- At Sidewalk-west of Sugar Creek Road and approximately 130 feet north of North Tryon Street/US-29
North Tryon Street/US-29 & I-85 Connector	2.0	1.7	Receptor 2- Parking lot north of North Tryon Street/US-29
North Tryon Street/US-29 & University City Boulevard	1.9	1.6	Receptor 2- Parking lot south of N US 29 Bypass Highway
North Tryon Street/US-29 & W.T. Harris Boulevard	3.9	3.2	Receptor 8- Sidewalk north of North Tryon Street/US-29, about 100 feet east of W.T. Harris Boulevard
North Tryon Street/US-29 & Mallard Creek Church Road	3.1	2.6	Receptor 14- Sidewalk west of East Mallard Creek Church Road and about 120 feet north of North Tryon Street/US-29

4.1.2 No-Build and TSM Alternatives (2030)

The results of the mobile source air quality modeling analysis under No-Build (2030) conditions are provided in Table 4-2. The No-Build Alternative represents the future without the proposed

project and takes into account the impact from other improvement projects that would be undertaken. The values shown are the maximum CO concentrations estimated near each intersection during the peak traffic period.

As shown in Table 4-2, no violations of the 1-hour or 8-hour NAAQS for CO are expected under the No-Build condition. Therefore, there would be no air quality impacts under the No-Build Alternative.

**Table 4-2
No-Build Maximum Carbon Monoxide Concentrations at Intersections (2030)**

Intersection	Maximum CO Concentration (ppm)		Location of Maximum CO Concentration
	1-Hour Average NAAQS - 35ppm	8-Hour Average NAAQS - 9ppm	
North Tryon Street/US-29 & Sugar Creek Road	2.5	2.1	Receptor 13- At Sidewalk-west of Sugar Creek Road and about 215 feet north of North Tryon Street/US-29
North Tryon Street/US-29 & I-85 Connector	1.6	1.3	Receptor 1- Parking lot south of North Tryon Street/US-29
North Tryon Street/US-29 & University City Boulevard	1.7	1.4	Receptor 3- Parking lot at northwest corner of North Tryon Street/US-29 and Stetson Drive
North Tryon Street/US-29 & W.T. Harris Boulevard	2.5	2.1	Receptor 23- West of W.T. Harris Boulevard, about 70 feet south of North Tryon Street/US-29
North Tryon Street/US-29 & Mallard Creek Church Road	2.4	2.0	Receptor 14- West of East Mallard Creek Church Road and about 120 feet north of North Tryon Street/US-29

The TSM Alternative includes the highway and transit improvements associated with the No-Build Alternative, along with additional service and facilities to improve service along the Northeast Corridor. These improvements include skip-stop bus service along North Tryon Street/US-29, more frequent service, and significant additions or improvements to the park-and-ride facilities in the corridor. The TSM Alternative was not assessed for impacts as part of this analysis. If chosen for implementation, separate environmental documents for federally funded portions would be prepared by the sponsors of those projects. However, because No-Build Alternative would have no adverse air quality impacts, it is anticipated that the transit improvements associated with the TSM Alternative would be comparable to the No-Build Alternative.

4.1.3 Light Rail Alternative (2030)

The results of the mobile source air quality modeling analysis under proposed Light Rail Alternative (2030) conditions are provided in Table 4-3. The values shown are the maximum CO

concentrations estimated near each intersection during the peak traffic period. As shown in Table 4-3, no violations of the 1-hour or 8-hour NAAQS for CO are projected to occur under the Light Rail Alternative. Therefore, there would be no microscale level air quality impacts under the Light Rail Alternative.

**Table 4-3
Light Rail Alternative
Maximum Carbon Monoxide Concentrations at Intersections (2030)**

Intersection	Maximum CO Concentration (ppm)		Location of Maximum CO Concentration
	1-Hour Average NAAQS - 35ppm	8-Hour Average NAAQS - 9ppm	
North Tryon Street/US-29 & Sugar Creek Road	2.6	2.2	Receptor 13- At Sidewalk-west of Sugar Creek Road and about 215 feet north of North Tryon Street/US-29
North Tryon Street/US-29 & I-85 Connector	1.7	1.4	Receptor 1- Parking lot south of North Tryon Street/US-29
North Tryon Street/US-29 & University City Boulevard	1.7	1.4	Receptor 3- Parking lot at northwest corner of N. Tryon Street/US-29 and Stetson Drive
North Tryon Street/US-29 & W.T. Harris Boulevard	2.5	2.1	Receptor 23- West of W.T. Harris Boulevard, about 70 feet south of North Tryon Street/US-29
North Tryon Street/US-29 & Mallard Creek Church Road	2.4	2.0	Receptor 14- West of East Mallard Creek Church Road and about 120 feet north of N. Tryon Street/US-29

4.1.3.1 Project-Level Conformity

Transportation conformity is regulated under Mecklenburg County Air Pollution Control Ordinance (MCAPCO) Section 2.2000 that requires that planned transportation projects be included in the Mecklenburg County Transportation Conformity Demonstration, which is prepared by an inter-agency group supporting the MUMPO. The proposed LYNX BLE Project is an element of MUMPO's adopted 2030 LRTP, and is included in the County's conformity document as a regionally significant project. Therefore, the proposed Light Rail Alternative is included in a transportation program that conforms to the SIP.

The two documents that demonstrate transportation conformity are as follows:

- 1) *Conformity Analysis and Determination Report: Demonstrating Conformance of the Mecklenburg-Union Metropolitan Planning Organization - FY 2004-2010 Transportation Improvement Program with the Provisions of the North Carolina State Implementation Plan and the Transportation Equity Act for the 21st Century.* (MUMPO, 2005)
- 2) *Conformity Analysis and Determination Report: Demonstrating Conformance of the Mecklenburg-Union Metropolitan Planning Organization 2030 Long-Range*

Transportation Plan with the Provisions of the North Carolina State Implementation Plan and the Transportation Equity Act for the 21st Century. (MUMPO, 2005)

For this project, the transit and roadway improvements encompassing the Light Rail Alternative were included in the conformity analysis. The conformity report concluded that the MUMPO Transportation Plans conform to the purpose of the North Carolina SIP and therefore should not cause or contribute to a violation of the NAAQS.

Since the region has air quality problems, the 2030 LRTP must comply with the state-wide air quality attainment plan and must be updated every at least every four years. The 2030 LRTP covers most of Union County, including Monroe and Wingate, and was approved by April 20, 2005. The plan is currently within the EPA allowed 12-month grace period and is expected to be finalized by Spring 2010. The update of the LRTP will continue to include the LYNX BLE Project.

4.1.3.2 Parking Facilities

The two parking structures that comprise the proposed parking garage for the Sugar Creek Station Option 2 and the I-485/N.Tryon Station would be the only two proposed parking facilities that would require a Transportation Facilities Construction Permit from the Mecklenburg County LUESA Air Quality Section. The Sugar Creek Station Option 2 parking garage worst-case scenario is proposed to include a maximum of 1,300 parking spaces on five levels. The I-485/N.Tryon Street Station parking garage worst-case scenario is proposed to include 2,134 parking spaces and approximately 80 surface parking spaces. The EPA's computer model PAL 2.1 was used to predict maximum CO concentrations generated by traffic at these proposed parking facilities. The worst case scenario (maximum vehicular capacity which would result in maximum emissions) was modeled to calculate the potential impacts from the parking garages as opposed to the 30% design plans which are still under development.

The parking garages were evaluated using 2030 emissions factors and traffic volumes generated by full operation of the parking facilities. It was conservatively assumed that the parking garages would operate at 100 percent capacity during the a.m. and p.m. peak hours and that all cars would be entering in the a.m. and exiting in the p.m. It was also assumed that all cars would enter and exit on the ground level for the Sugar Creek Station Option 2 parking garage. For the I-485/N.Tryon Station parking garage, it was assumed that all cars on the ground level and second level would exit via the ground level exit, while the vehicles on the third, and fourth levels would use the exit on the third level.

Carbon monoxide concentrations from the PAL model output were given in grams/cubic meter and were converted to ppm. Table 4-4 lists the predicted 2030 maximum CO concentrations (which include the background concentration of 1.1 ppm) for the design proposed for each station park-and-ride lot and garage subject to MCAPCO.

**Table 4-4
Predicted Maximum Carbon Monoxide Concentrations at Parking Garages (2030)**

Station Name	Maximum CO Concentration (ppm)		Location of Maximum CO Concentration
	1-Hour Average NAAQS – 35 ppm	8-Hour Average NAAQS – 9 ppm	
Sugar Creek Station Option 2	2.1	1.7	Residence on Sugar Creek Road and Bearwood Avenue
I-485/North Tryon Station	1.8	1.5	Southwest Corner of Garage

As shown in Table 4-4, no violations of the 1-hour or 8-hour NAAQS for CO are expected due to the operation of these parking facilities. These results are expected to satisfy the permit requirements as outlined by MCAPCO.

4.1.3.3 Regional Emissions

The Light Rail Alternative would provide a reduction in regional vehicle miles traveled (VMT) by approximately 55 million miles. This reduction in VMT would provide an air quality benefit that would not be realized if the No-Build Alternative was selected for implementation. As shown in Table 4-5, the Light Rail Alternative would reduce annual CO, NO_x and VOC emissions by 268 tons, 10 tons, and 14 tons, respectively.

**Table 4-5
Comparison of Regional Emissions
No-Build and Light Rail Alternatives (2030)**

	No-Build Alternative	Light Rail Alternative	Change from No-Build
Annual Regional VMT (millions of miles/year)	36,954	36,899	- 55
Annual CO Emissions (tons) ¹	180,782	180,514	- 268
Annual NO _x Emissions (tons) ²	6,355	6,345	- 10
Annual VOC ³	9,939	9,925	- 14

¹ EPA Emissions Factor 2030 – 4.438

² EPA Emissions Factor 2030 – 0.156

³ EPA Emissions Factor 2030 – 0.244

4.1.4 Light Rail Alternative – Sugar Creek Design Option

The results of the mobile source air quality modeling analysis for the Light Rail Alternative-Sugar Creek Design Option (2030) conditions are provided in Table 4-6. The Sugar Creek Design Option (SCDO) represents the future conditions with the proposed project and takes into account the variations in traffic due to the alignment turning north just northeast of Sugar Creek

Road to enter the median of North Tryon Street/US-29 instead of at Old Concord Road under the Light Rail Alternative. The values shown are the maximum CO concentrations estimated near each intersection during the peak traffic period.

No violations of the 1-hour or 8-hour NAAQS for CO are expected under the Light Rail Alternative – Sugar Creek Design Option. A comparison of the predicted carbon monoxide concentrations listed above to the NAAQS (See Table 3-1) indicates no predicted exceedances of these standards in 2008 or 2030. Therefore, there would be no microscale air quality impacts for the Light Rail Alternative – Sugar Creek Design Option. On a regional level, the Light Rail Alternative – Sugar Creek Design Option would achieve the same benefits to air quality as the Light Rail Alternative as shown in Table 4-5.

**Table 4-6
Light Rail Alternative – Sugar Creek Design Option
Maximum Carbon Monoxide Concentrations at Intersections (2030)**

Intersection	Maximum CO Concentration (ppm)		Location of Maximum CO Concentration
	1-Hour Average NAAQS – 35ppm	8-Hour Average NAAQS – 9ppm	
North Tryon Street/US-29 & Sugar Creek Road	2.5	2.1	Receptor 20- At Sidewalk-south of North Tryon Street/US-29 and about 130 feet west of Sugar Creek Road
North Tryon Street/US-29 & I-85 Connector	1.6	1.3	Receptor 1- Parking lot south of North Tryon Street/US-29
North Tryon Street/US-29 & University City Boulevard	1.7	1.4	Receptor 3- Parking lot at northwest corner of North Tryon Street/US-29 and Stetson Drive
North Tryon Street/US-29 & W.T. Harris Boulevard	2.5	2.1	Receptor 23- West of W.T. Harris Boulevard, about 70 feet south of North Tryon Street/US-29
North Tryon Street/US-29 & Mallard Creek Church Road	2.4	2.0	Receptor 14- West of East Mallard Creek Church Road and about 120 feet north of North Tryon Street/US-29

4.2 Mitigation

The following sections describe the proposed mitigation for the No-Build, TSM and Light Rail Alternative. In addition to proposed mitigation, agency coordination measures are discussed briefly.

4.2.1 No-Build and TSM Alternatives

Mitigation includes the enhancement of positive effects as well as the minimization or elimination of negative effects of a project. The No-Build Alternative would not result in a reduction in VMT as would occur with the Light Rail Alternative. Therefore, the selection of

either the No-Build or TSM Alternative would require that the LRTP be updated to remove the proposed LYNX BLE Project. This would also require that MUMPO seek other means to meet the region's emissions budget for conformance with the CAA. Additionally, if the TSM Alternative would be selected for implementation, these impacts and resulting mitigation measures would be examined in separate environmental documentation.

4.2.2 Light Rail Alternative

Since traffic volumes at the "worst-case" intersections (intersections expected to generate the highest microscale CO concentrations) would not be predicted to cause exceedances of the NAAQS, no remaining intersections carrying project-generated vehicular traffic would be expected to cause exceedances of the NAAQS. Therefore, the Light Rail Alternative would not be predicted to cause exceedances of the NAAQS, and mitigation would not be required.

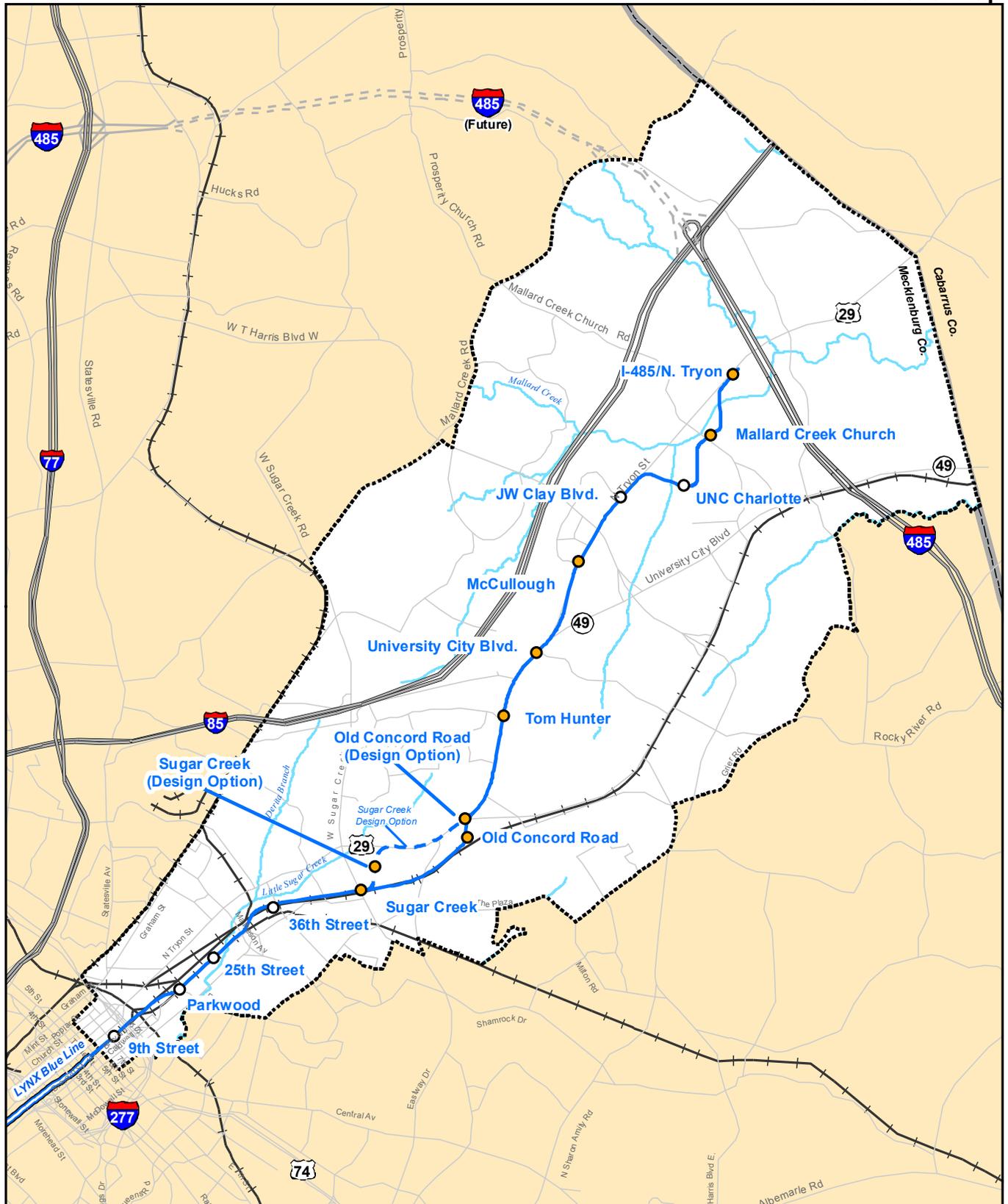
CATS will continue coordination with the Mecklenburg County LUESA Air Quality Section regarding the required Transportation Facilities Construction Permit. Coordination will need to occur prior to permit application to confirm the applicability of the permit for each proposed park-and-ride facility. These activities shall take place once station site plans have been approved for construction.

During construction, measures will be taken to minimize air quality impacts by adhering to the regulations outlined in Mecklenburg County's Dust ordinance – MCAPCO Regulation 1.5108. The regulation states:

- (a) No person shall discharge into the atmosphere dust in such quantities or of such toxic or corrosive nature that may be injurious to humans or animals or may cause damage to the property of others.
- (b) Fugitive dust shall not be discharged from an industrial establishment in such a manner and in such quantity that the ambient air quality standards are exceeded at the property line.
- (c) No owner or lessee of a storage lot, parking lot, automotive sales lot, access roadway, or any other place shall permit dust or other material readily scattered by wind to leave such property unless the owner or lessee shall have first taken reasonable precautions or otherwise have maintained such property in such a manner as to minimize air pollution.
- (d) No person shall operate any vehicle in such a manner that particulate matter loaded thereon is discharged onto a public highway, street, road, or right-of-way, except public employees in the exercise of their duties, or contractors and their employees building, paving, or repairing the section of highway, street, road, or right-of-way in question.

4.2.3 Light Rail Alternative – Sugar Creek Design Option

Mitigation for this design option would be the same as the Light Rail Alternative as described in Section 4.2.2. Therefore, no additional mitigation is required.



Legend

- | | | |
|--------------------------------------|------------------|-------------|
| Northeast Corridor Limits | LYNX Blue Line | Railroads |
| Proposed Light Rail Alternative | Highway | Streams |
| Design Option | Major Roads | County Line |
| Proposed Stations | Highway (Future) | |
| Proposed Stations with Park-and-Ride | | |

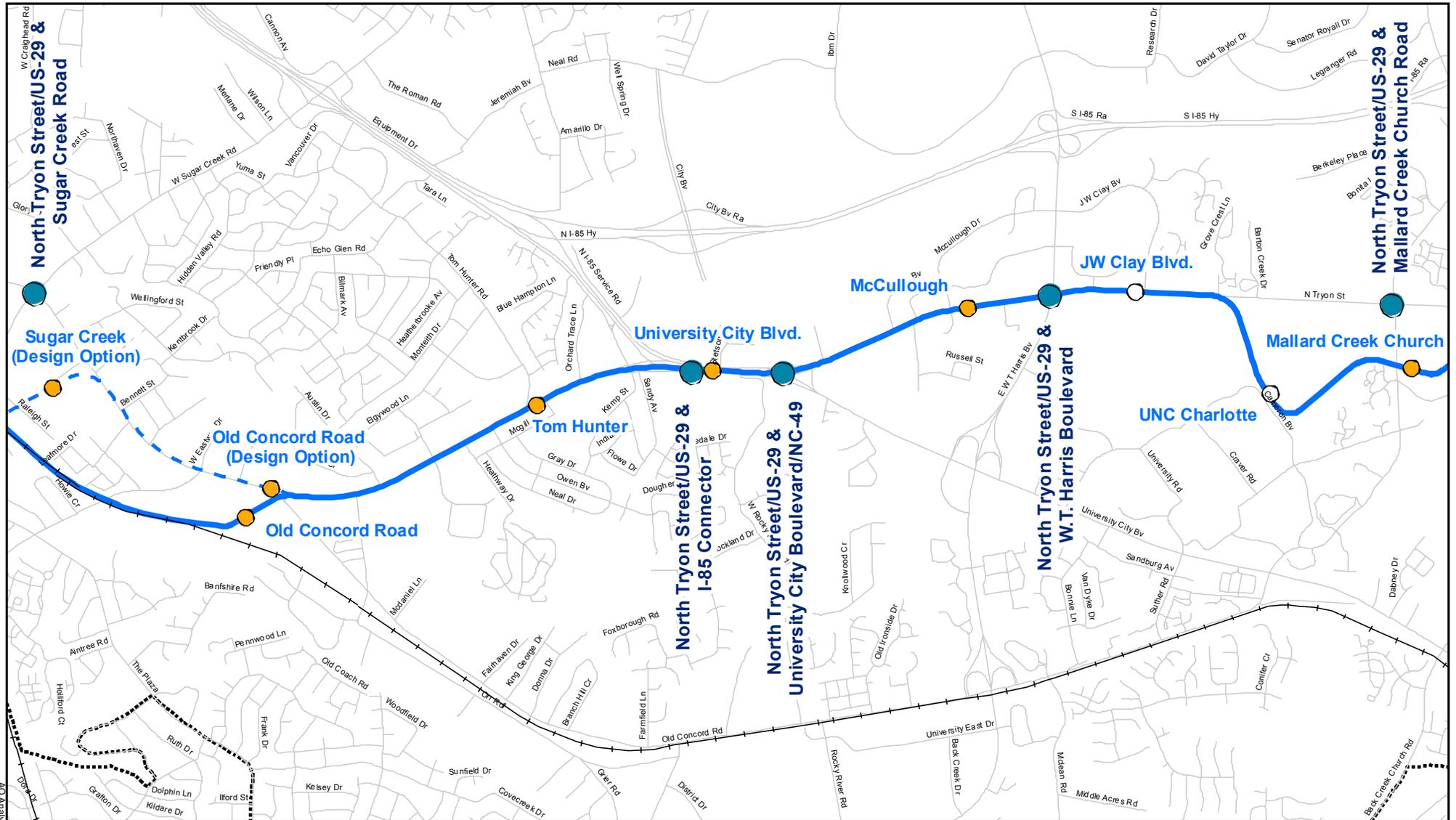
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Data Source:
CATS, City of Charlotte GIS, and Mecklenburg County GIS

AQ_INE_Corridor_Base_Map_Rev00.pdf

03.21.09

Intersection Locations for Air Quality Analysis



<p>Legend</p> <ul style="list-style-type: none"> Northeast Corridor Limits Proposed Light Rail Alternative Design Option Proposed Stations Proposed Stations with Park-and-Ride 	<ul style="list-style-type: none"> Lynx Blue Line Roads Interstate Railroads 	<ul style="list-style-type: none"> Intersections for Air Quality Analysis 	<p>Map Vicinity</p>	<p>1,000 500 0 1,000 Feet 1 inch = 2,984 feet</p> <p><small>Data Source: Charlotte Area Transit System, STV/RWA, Mecklenburg County GIS</small></p>
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Air Quality Analysis Intersection Locations - Fig2 Rev 01.pdf

10/30/20