

## 12.0 AIR QUALITY

This chapter describes the existing air quality within the study area for the proposed LYNX Blue Line Extension Northeast Corridor Light Rail Project (LYNX BLE) and discusses the National Ambient Air Quality Standards (NAAQS) and federal regulations protecting air quality. In addition, projected year (2030) air quality conditions at various intersections and proposed parking facilities associated with the alternatives under consideration in this Final Environmental Impact Statement (EIS) are also detailed. Mitigation measures are identified. Additional technical information may be found in the supporting *Air Quality Technical Report* (January 2010) and *Air Quality Technical Report Addendum #1* (May 2011).

### 12.1 Changes to this Chapter since the Draft EIS

This chapter has been revised to reflect the identification of the proposed Light Rail Alternative as the Preferred Alternative for the LYNX BLE. Additionally, since the Draft EIS, the design of the proposed LYNX BLE project has been refined as described in Chapter 2.0: Alternatives Considered. These refinements, including the potential changes to air quality, are also included in this chapter. The forecast year used for the project's regional level transportation evaluation measures has been changed from 2030 to 2035, consistent with the region's Long Range Transportation Plan. The forecast year used for the project's corridor and station area level transportation analysis continues to be 2030.

### 12.2 Legal and Regulatory Context

#### 12.2.1 Air Quality Standards

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

The EPA classifies urban environments as being either in "attainment" or "non-attainment." An urban area that exceeds the NAAQS for one or more pollutants is said to be in "non-attainment" of the NAAQS enforced under the CAA. The EPA established primary and secondary NAAQS for six air pollutants: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), particulate matter (PM) and lead (Pb). The designation of an area is determined on a pollutant-by-pollutant basis.

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

In accordance with 40 CFR 93.116, a "Federal Highway Administration/Federal Transit Administration project must not cause or contribute to any new localized CO or Particulate Matter of less than 10 micrometers or less (PM<sub>10</sub>) violation or increase the frequency or severity of any existing CO or PM<sub>10</sub> violation in CO and PM<sub>10</sub> 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."

#### 12.2.2 Project-Level Conformity Determination

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

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

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

Project level conformity decisions are made on entire projects as defined by the CAA. Any transportation project funded through the Federal Transit Administration (FTA) must be listed in the metropolitan region's Transportation Improvement Program (TIP). The TIP identifies the transportation projects and strategies that the Metropolitan Planning Organization (MPO) and state Department of Transportation plan to undertake. The TIP is the region's way of allocating its limited transportation resources among the various capital and operating needs of the area, based on a clear set of short-term transportation priorities. The TIP must conform to the SIP for air quality in accordance with the CAA. The LYNX BLE is included in the State and Mecklenburg-Union Metropolitan Planning Organization (MUMPO) conforming Transportation Improvement Program (TIP) entitled *FY2009-2015 Transportation Improvement Program*, (May 2008) and *2035 Long Range Transportation Plan* (LRTP).

The *Metrolina Conformity Analysis and Determination Report* (February 2010) documents the region's compliance with the provisions of the CAA in concurrence with all conformity requirements as detailed in 40 CFR Parts 51 and 93 (the Transportation Conformity Rule) and 23 CFR Part 450 (the Metropolitan Planning Regulations as established in the Transportation Equity Act for the 21st Century [TEA-21]). On May 3, 2010, based on the conformity determinations and comments by the EPA, the Federal Highway Administration and FTA issued its finding that the MUMPO *2035 LRTP* and *FY2009 – 2015 TIP* conform to the purposes of the SIP.

### 12.3 Affected Environment

This section discusses the existing air quality NAAQS compliance attainment status for the six criteria pollutants within the region. The affected environment section also reviews the model results for the existing CO concentrations by location of air quality monitoring site in Mecklenburg County.

#### 12.3.1 Existing Regional Level Air Quality Attainment Status

The Charlotte-Gastonia-Rock Hill, NC-SC area is the name of the present eight-county area classified by the EPA for NAAQS. This area is currently classified as an attainment area for all NAAQS, with the exception of 8-hour O<sub>3</sub>. Additionally, Mecklenburg County is also classified by the EPA for NAAQS. Mecklenburg is in attainment for all NAAQS except for 8-hour O<sub>3</sub> and is classified as a maintenance area (not classified) for CO. Table 12-1 lists the NAAQS Attainment by geography.

**Table 12-1  
NAAQS Attainment Status, 2009**

NAAQS	Charlotte-Gastonia-Rock Hill, NC-SC Area Attainment Status	Mecklenburg County Attainment Status
CO	Attainment	Maintenance
O <sub>3</sub> (8-hour average)	Non-attainment	Non-attainment
NO <sub>2</sub>	Attainment	Attainment
SO <sub>2</sub>	Attainment	Attainment
PM <sub>10</sub>	Attainment	Attainment
PM <sub>2.5</sub>	Attainment	Attainment
Pb	Attainment	Attainment

**12.3.2 Existing Corridor Level Carbon Monoxide Concentrations**

The results of the mobile source air quality modeling analysis under existing conditions (2009) are provided in Table 12-2. The values shown are the maximum CO concentrations estimated near each intersection during the peak traffic period. As shown in Table 12-2, no violations of the 1-hour or 8-hour NAAQS for CO are estimated under existing conditions.

**Table 12-2  
Existing Maximum Carbon Monoxide Concentrations at Intersections, 2009**

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 and 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 and I-85 Connector	2.0	1.7	Receptor 2 - Parking lot north of North Tryon Street/US-29
North Tryon Street/US-29 and University City Blvd./NC-49	1.9	1.6	Receptor 2 - Parking lot south of North US 29 Bypass Highway
North Tryon Street/US-29 and 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

**12.4 Environmental Consequences**

This section includes an evaluation of the direct air quality impacts of the No-Build Alternative and Preferred Alternative. Maximum CO concentrations at intersections by alternative are shown in Table 12-3 and described in this section. Construction-related impacts are discussed in Chapter 18.0: Construction Impacts.

**12.4.1 No-Build Alternative**

The No-Build Alternative would not result in a reduction in vehicle miles traveled (VMT) as would occur with the Preferred Alternative. Therefore, the selection of the No-Build Alternative would require that the LRTP be updated to remove the proposed LYNX BLE project. This would also require that MUMPO re-evaluate the conformity analysis for the LRTP.

The results of the mobile source air quality modeling analysis under No-Build (2030) conditions are provided in Table 12-3. 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 No-Build Alternative, as no additional parking facilities would be built. As a result, there would be no air quality impacts under the No-Build Alternative and no further parking lot analyses would be required for this alternative.

**Table 12-3  
Maximum Carbon Monoxide Concentrations at Intersections by Alternative, 2030**

Intersection	1-Hour Average NAAQS – 35ppm		8-Hour Average NAAQS – 9ppm		Location of Maximum Concentration	
	No-Build	Preferred Alternative	No-Build	Preferred Alternative	No-Build	Preferred Alternative
North Tryon Street/US-29 and Sugar Creek Road	2.5	2.6	2.1	2.2	At Sidewalk-west of Sugar Creek Road and about 215 feet north of North Tryon Street/US-29	At Sidewalk-west of Sugar Creek Road and about 215 feet north of North Tryon Street/US-29
North Tryon Street/US-29 and I-85 Connector	1.6	1.7	1.3	1.4	Parking lot south of North Tryon Street/US-29	Parking lot south of North Tryon Street/US-29
North Tryon Street/US-29 and University City Blvd./NC-49	1.7	1.7	1.4	1.4	Parking lot at northwest corner of North Tryon Street/US-29 and Stetson Drive	Parking lot at northwest corner of North Tryon Street/US-29 and Stetson Drive
North Tryon Street/US-29 and W.T. Harris Boulevard	2.5	2.5	2.1	2.1	West of W.T. Harris Boulevard, about 70 feet south of North Tryon Street/US-29	West of W.T. Harris Boulevard, about 70 feet south of North Tryon Street/US-29

**12.4.2 Preferred Alternative**

**12.4.2.1 Regional Level Impacts**

The Preferred Alternative would provide a reduction in regional VMT by approximately 75 million miles (Table 12-4). This regional reduction in VMT would subsequently reduce annual CO, NO<sub>x</sub> and VOC emissions (Table 12-4), which would not be achieved under the No-Build Alternative.

**Table 12-4  
Comparison of Regional Emissions for the No-Build and Preferred Alternative, 2035**

Factor	No-Build Alternative	Preferred Alternative	Change from No-Build
Annual Regional VMT (millions of miles/year)	33,971	33,896	-75
Annual CO Emissions (tons) <sup>1</sup>	157,878	157,530	-348
Annual NO <sub>x</sub> Emissions (tons) <sup>2</sup>	5,550	5,537	-13
Annual VOC <sup>3</sup>	8,680	8,661	-19

<sup>1</sup>EPA Emissions Factor 2035 – 4.216, <sup>2</sup>EPA Emissions Factor 2035 – 0.148, <sup>3</sup>EPA Emissions Factor 2035 – .232

**12.4.2.2 Corridor Level Impacts**

The results of the mobile source air quality modeling analysis under the Preferred Alternative (2030) conditions are provided in Table 12-3. 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 projected under the Preferred Alternative. The proposed LYNX BLE project is an element of MUMPO’s adopted 2035 LRTP and is included in the FY2009–2015 Transportation Improvement Program, which were both found to conform to the purposes of the SIP on May 3, 2010. Therefore, the Preferred Alternative is included in a transportation program that conforms to the SIP.

**12.4.2.3 Station Area Impacts**

The structure that comprises the proposed parking garage for the University City Blvd. Station would be the only proposed parking facility that would require a Transportation Facilities Construction Permit from the Mecklenburg County Land Use & Environmental Services Agency (LUESA) Air Quality Section. As such, the EPA’s computer model PAL 2.1 was used to predict maximum CO concentrations generated by traffic at this proposed parking facility. (Note: A parking garage is also proposed at the JW Clay Blvd. Station. However, this parking garage would contain approximately 690 spaces, falling below the permit threshold of 750 spaces.)

Preliminary engineering conceptual plans were used to model the proposed maximum number of spaces for this deck in order to represent a “worst-case” scenario. For air quality modeling purposes, the University City Blvd. garage includes a maximum of approximately 1,506 parking spaces on up to six levels.

Carbon monoxide concentrations from the PAL model output were given in grams/cubic meter and were converted to ppm. Table 12-5 lists the predicted 2030 maximum CO concentrations (which include the background concentration of 1.1 ppm) for the design proposed at the University City Blvd. Station. No violations of the 1-hour or 8-hour NAAQS for CO are expected due to the operation of this parking facility. These results are expected to satisfy the permit requirements as outlined by Mecklenburg County Air Pollution Control Ordinance (MCAPCO).

**Table 12-5  
Preferred Alternative  
Predicted Maximum Carbon Monoxide Concentration, 2030**

Station Name	Maximum CO Concentration (ppm)		Location of Maximum CO Concentration
	1-Hour Average NAAQS – 35 ppm	8-Hour Average NAAQS – 9 ppm	
University City Blvd.	2.8	2.4	Southwest Corner of Proposed Garage

**12.5 Mitigation**

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 proposed project-generated vehicular traffic would be expected to cause exceedances of the NAAQS. Therefore, the Preferred Alternative would not be expected to cause exceedances of the NAAQS and mitigation would not be required.

During development of the Draft EIS, Mecklenburg County LUESA Air Quality Section notified CATS about the newly developed EPA on-road mobile source emissions model known as the Motor Vehicle Emissions Simulation model (MOVES 2010a) (see Appendix B: Agency Correspondence). At this time, EPA has not approved MOVES 2010a for project-level conformity analyses (i.e., LYNX BLE), thus the use of MOBILE6.2 remains acceptable for analyzing emissions from motor vehicles.

CATS will continue coordination with Mecklenburg County LUESA Air Quality Section. This coordination will need to occur prior to modeling air quality for a Transportation Facilities Construction Permit, and before permit application. CATS will confirm the determination of the use of MOVES 2010a, as well as the applicability of the permit for each proposed park-and-ride facility. All of these activities will take place once the station site plans have been approved for construction.