

**Appendix B: Proposed Refinements
Resources with No Impacts
Supporting Documentation**

Durham-Orange Light Rail Transit Project



October 2018

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List of Acronyms and Abbreviations

Acronym/Abbreviation	Definition
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
ACS	American Community Survey
CO	carbon monoxide
DEIS	Draft Environmental Impact Statement
D-O LRT	Durham-Orange Light Rail Transit Project
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FEIS	Final Environmental Impact Statement
LOS	level of service
LRTP	Long Range Transportation Plan
NAAQS	National Ambient Air Quality Standards
NCCU	North Carolina Central University
NCDOT	North Carolina Department of Transportation
NCRR	North Carolina Railroad
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NS	Norfolk Southern
O_3	ground-level ozone
Pb	airborne lead
$\text{PM}_{2.5}$	fine inhalable particulate matter
PM_{10}	inhalable particular matter
ppb	parts per billion
ppm	parts per million
ROD	Record of Decision
SIP	State Implementation Plan
SO_2	sulfur dioxide
TIP	Transportation Improvement Program
VMT	Vehicle Miles Traveled

1. Introduction

GoTriangle reviewed each resource assessed in the National Environmental Policy Act (NEPA) documentation for the Previous Design and considered whether the Proposed Refinements would result in a change in effects to those resources. Where effects are anticipated, GoTriangle conducted a full analysis of the effects of the Proposed Refinements for disclosure in the Supplemental Environmental Assessment (EA). This document summarizes the resources that would not be affected by the Proposed Refinements relative to the Previous Design or the No Build Alternative. No impacts were determined to the following resource categories:

- Freight and passenger railroads
- Airports
- Air quality
- Socioeconomic and demographic conditions

2. Freight and Passenger Railroads

The Previous Design showed no direct impacts on the daily rail operations for freight or passenger rail service. The Proposed Refinements do not change the Durham-Orange Light Rail Transit (D-O LRT) alignment in a location that would have an effect on railroads. The light rail alignment would remain on the southern side of the North Carolina Railroad (NCRR) right-of-way on separate tracks largely within the existing Pettigrew Street cross section. The light rail alignment would maintain the minimum distance of 40 feet from any potential future railroad track and a minimum distance of 55 feet from the nearest existing railroad track, as identified and required by NCRR. Mitigation is not required for the implementation of the Proposed Refinements; however, coordination with NCRR, Norfolk Southern (NS), and North Carolina Department of Transportation (NCDOT) Rail Division will continue through design and construction for use of the NCRR right-of-way.

3. Airports

The Federal Aviation Administration (FAA) recommends safe distances for proposed land uses that would increase wildlife hazards for airport facilities. To protect the approach, departure, and circling of airspace, the recommended separation distances are 5,000 feet, 10,000 feet, and 5 miles, depending on the presence of either piston-powered or turbine-powered aircraft. The Previous Design showed no direct impact to airport-owned property but that portions of the alignment would be located within the 5-mile protection zone. The Proposed Refinements would include the addition of Blackwell-Mangum Streets Station that would be located outside of the 5,000/10,000-foot protection zones, but would be within the 5-mile protection zone. No impacts are expected because the station would be shielded by existing structures and located in the congested area of the city where the shielded light rail station would not adversely affect safety in air navigation. There would be no impacts to airport protection zones as a result of the Proposed Refinements. Mitigation is not required for the implementation of the Proposed Refinements.

4. Air Quality

This section describes the potential air quality impacts from the D-O LRT Project as determined in the NEPA documentation for the Previous Design and the changes anticipated with the Proposed Refinements. All prior documentation, including the relevant technical reports and environmental evaluations, are incorporated by reference.

4.1 Legal and Regulatory Framework

Please refer to the legal and regulatory framework identified in Appendix K23 of the Draft Environmental Impact Statement (DEIS).

Both Durham and Orange Counties are currently designated as being in attainment with the National Ambient Air Quality Standards (NAAQS) for the six criteria pollutants: particulate matter, as inhalable particulate matter (PM₁₀) and fine inhalable particulate matter (PM_{2.5}); ground-level ozone (O₃); carbon monoxide (CO); sulfur dioxide (SO₂); nitrogen dioxide (NO₂); and airborne lead (Pb). On March 6, 2015, the U.S. Environmental Protection Agency (EPA) published a rule in the Federal Register (<https://www.gpo.gov/fdsys/pkg/FR-2015-03-06/pdf/2015-04012.pdf#page=1>) establishing a final rule for implementing the 2008 8-hour ozone NAAQS. The final rule, which revoked the 1997 8-hour O₃ NAAQS for Durham and Orange Counties and most areas of the nation, states that Transportation and General Conformity requirements no longer apply for ozone in maintenance and nonattainment areas for which the 1997 8-hour NAAQS was revoked.

However, on February 16, 2018, the U.S. Court of Appeals for the D.C. Circuit issued a decision in South Coast Air Quality Management District v. EPA, No. 15-1115, which struck down portions of the 2008 Ozone NAAQS State Implementation Plan (SIP) Requirements Rule concerning the ozone NAAQS. Those portions of the 2008 Ozone NAAQS SIP Requirements Rule included transportation conformity requirements associated with EPA's revocation of the 1997 ozone NAAQS. Therefore, Durham and Orange Counties are still subject to ozone conformity requirements until completion of a 20-year maintenance period for the 1997 ozone NAAQS. That period will expire on December 26, 2027, which is 20 years after the date the counties were redesignated from nonattainment to maintenance/attainment under the 1997 NAAQS.

For a transportation project funded either by the Federal Highway Administration or Federal Transit Administration, a conformity determination is needed to ensure that the project would not adversely affect continued attainment/maintenance of the (revoked) 1997 ozone NAAQS, and would not exceed emissions budgets established in a maintenance plan developed as part of the redesignation from nonattainment to maintenance for that standard. Conformity for ozone for a transportation project is usually determined by confirming that the project is included in the approved Long Range Transportation Plan (LRTP) and State Transportation Improvement Program (STIP). The local Metropolitan Planning Organization, in developing the local LRTP and TIP, must conduct analysis of emissions budgets for their urban planning to ensure that the collection of projects within the planning period will not "break the budgets." As documented in the DEIS, the D-O LRT Project was incorporated into the approved plans, determined to conform with the State Implementation Plan (SIP), and would not cause or contribute to violation of the NAAQS.

When the DEIS was published in August 2015, Durham County was still designated as maintenance for CO, and a conformity analysis was performed for the Previous Design as required under Transportation Conformity rules. As of September 18, 2015, the North Carolina counties that were listed as maintenance for CO, including Durham County, completed the 20-year maintenance period and are listed as in

attainment status only. As an attainment area, Transportation Conformity requirements for CO no longer apply in Durham County, thus eliminating the need for a quantitative hot spot analysis.

In summary, Durham and Orange Counties are currently designated as being in attainment with the NAAQS for five of the six criteria pollutants, and attainment/maintenance for the prior 1997 ozone NAAQS, per the court decision explained above. Transportation Conformity requirements that apply to ozone precursor pollutants (nitrogen oxides and volatile organic compounds) would be met as documented in the DEIS for the Project as previously designed, and for the Proposed Refinements, conformity would be demonstrated by inclusion of the project in the approved LRTP and STIP. GoTriangle has been coordinating closely with the DCHC MPO and anticipates that the D-O LRT Project, including the Proposed Refinements, will be in both the LRTP and a conforming STIP in early February 2019.

4.2 Methodology

Durham and Orange Counties are currently designated as being in attainment with the NAAQS for five of the six criteria pollutants, and attainment/maintenance for the ozone due to the prior 1997 NAAQS (see above). Ozone conformity is demonstrated as described in the 2015 DEIS, and CO conformity requirements no longer apply, as they have expired. Therefore, this document provides a qualitative discussion of the anticipated effects on air quality as a result of the Proposed Refinements. The qualitative assessment provided below summarizes: (1) the existing air quality conditions based on monitored concentrations of the six criteria pollutants at the nearest available EPA monitoring locations within Durham and Orange Counties and (2) the qualitative assessment of the change in effects on air quality conditions due to the Proposed Refinements.

4.3 Affected Environment

The background concentrations of criteria air pollutants within Durham and Orange Counties were obtained from the EPA air data website at: <https://www.epa.gov/outdoor-air-quality-data>. This website provides access to outdoor air quality data collected from state, local, and tribal monitoring agencies across the United States. The values were measured in accordance with EPA guidance and specifications for monitoring technology and procedures.

Table 4-1 shows a summary of the background concentrations obtained from the monitoring sites for each pollutant nearest to the D-O LRT Project. These background concentrations are all below the listed NAAQS. The monitored sites meet regulatory criteria and are year-round monitors; as such, they are very comprehensive and reliable indicators of ambient air quality levels.

The monitored concentrations listed in **Table 4-1** are based on the most recent 3 years (2015-2017) of data available on the EPA website linked above. The only exception is Pb, for which no North Carolina monitors are listed in EPA's database for 2017. Therefore, the Pb value listed is based on the maximum design concentration (3-month average) in the 3-year period of 2014-2016. The monitored concentrations summarized in **Table 4-1** are based on the EPA criteria for determining compliance with the NAAQS as described in 40 CFR Part 50.

Table 4-1: Monitored Background Concentrations of Criteria Air Pollutants

Pollutant	Monitoring Site	Averaging Period	Monitored Concentration	NAAQS	Units
NO ₂	2826 Triple Oak Drive, Raleigh, NC	1-hour	34.0	100	ppb
		Annual	9.6	53	ppb
CO	2826 Triple Oak Drive, Raleigh, NC	1-hour	4.6	35	ppm
		8-hour	1.3	9	ppm
PM _{2.5}	801 Stadium Drive, Durham, NC	24-hour	20.0	35	µg/m ³
		Annual	8.8	12	µg/m ³
PM ₁₀	801 Stadium Drive, Durham, NC	24-hour	44.0	150	µg/m ³
O ₃	801 Stadium Drive, Durham, NC	8-hour	0.062	0.08	ppm
SO ₂	801 Stadium Drive, Durham, NC	1-hour	6.0	75	ppb
Pb	3801 Spring Forest Road, Raleigh, NC	3-month	0.006	0.15	µg/m ³

Source: Monitored concentrations represent 3-year averages of most recently available data from EPA’s air data website at: <https://www.epa.gov/outdoor-air-quality-data>.
 With the exception of ozone, NAAQS are from EPA’s website: <https://www.epa.gov/criteria-air-pollutants/naaqstable>. For ozone, the 8-hour standard is the 1997 standard which is listed here because of a February 16, 2018 U.S. Court of Appeals for the D.C. Circuit ruling (see section 4.1).

4.4 Environmental Consequences

In 2015, the North Carolina counties that were listed as maintenance for CO, including Durham County, completed the 20-year maintenance period and therefore, reverted to attainment for the CO NAAQS. Therefore, Transportation and General Conformity requirements no longer apply with respect to CO. Prior CO hot-spot analyses for the D-O LRT Project had shown compliance with CO NAAQS, and CO concentrations nationwide continue to drop further due to the gradual elimination of vehicles without catalytic converters from the nation’s highway vehicle fleet.

Ozone precursor air pollutant emissions from highway vehicles are typically proportional to vehicle miles traveled (VMT). **Previous NEPA documentation determined the D-O LRT Project would reduce VMT in the Triangle Region relative to the No Build Alternative (see DEIS table 4.13-1).** The Proposed Refinements would not measurably change VMT relative to the Previous Design; therefore, the Proposed Refinements would not result in measurable changes to emissions when compared to the emissions presented in previous NEPA documents. As a result, implementation of the Proposed Refinements is anticipated to have the same beneficial effects on regional air quality as the Previous Design. In addition, the resulting effects to air quality on an intersection basis are anticipated to be insignificant and result in concentrations well below the NAAQS requirements. It is not anticipated that the Proposed Refinements would substantially alter the localized effects disclosed in the NEPA documentation for the Previous Design. However, the Project and Proposed Refinements would demonstrate conformity through inclusion in an approved LRTP and STIP.

5. Socioeconomics

This section describes the potential socioeconomic impacts from the D-O LRT Project as determined in the NEPA documentation for Previous Design and potential changes that may be anticipated with the Proposed Refinements. All prior documentation, including the relevant technical reports and environmental evaluations, are incorporated by reference.

5.1 Legal and Regulatory Framework

The measurement of a project's impacts on socioeconomic conditions is an element of the NEPA evaluation. See 40 C.F.R. §§ 1502.15 – 1502.16. The Moving Ahead for Progress in the 21st Century Act (MAP-21) (P.L. 112-141) requires project sponsors to document the degree to which a transit project would impact local economic development as part of the NEPA review process.

5.2 Methodology

The NEPA documentation for the Previous Design includes socioeconomic assessments based on demographic data from the U.S. Census Bureau, specifically 2010 Census data, 2010 Demographic Profile, 2007 to 2011 American Community Survey (ACS) 5-year estimates, and 2040 Metropolitan Transportation Plan data prepared for the Triangle Regional Model. For the Proposed Refinements, updated ACS 5-year estimates (2012 to 2016) were reviewed for a refined study area based on the Proposed Refinements¹, and socioeconomic indicators were assessed to determine if there were changes to the affected environment that could change the findings of the NEPA documentation for the Previous Design.

5.3 Prior NEPA Documentation – Summary of Socioeconomic Assessments

The NEPA documentation for the Previous Design determined that, at the regional level, the proposed D-O LRT Project would not increase or decrease population, households, or employment; however, the location of growth and development would be influenced by the D-O LRT Project. The previous NEPA documentation predicted that population, households, and employment growth would be more concentrated near the LRT stations with the D-O LRT Project. Additionally, the D-O LRT Project would benefit transit-dependent populations by providing increased mobility and improved access and connectivity.

5.4 Affected Environment

Absent new decennial census data, GoTriangle examined the most recent ACS 5-year estimates (2012-2016) to determine whether socioeconomic conditions in the study area have changed since the previous NEPA documentation. The ACS 5-year estimates are based on relatively small population samples and can exhibit significant variations from year to year. In addition, ACS estimates often have relatively large margins of error² associated with specific estimates; for instance, the margin of error for a particular characteristic estimate for a census block group can be almost the same as the estimate itself. With the variability and uncertainty of the data, and the change in study area, GoTriangle concluded it is not possible to make a useful comparison of the 2012-2016 ACS 5-year to the socioeconomic data presented in the previous NEPA documentation. The data could, however, be used to provide a reasonable indicator

¹ Specifically, the study area was refined for the Proposed Refinements to include the area within ¼ mile on either side of the light rail alignment and ½ mile radius around each of the stations, consistent with most recent Federal Transit Administration guidance (Reporting Instructions for the Section 5309 Capital Investment Grants Program – New Starts, June 2017). The NEPA documentation for the Previous Design used a study area based on multiple alignment and station site alternatives.

² The margin of error is the difference between an estimate and its upper or lower confidence bounds. All published ACS margins of error are based on a 90-percent confidence level. Confidence bounds can be created by adding the margin of error to the estimate (for the upper bound) and subtracting the margin of error from the estimate (for the lower bound). Typically, the smaller the sample size, the larger the margin of error (<https://www.census.gov/programs-surveys/acs/guidance/training-presentations/acs-moe.html>).

of population characteristics for the study area. Demographic indicators for the Proposed Refinements study area are presented in **Table 5-1** based on the ACS 5-year estimates for 2012-2016. These indicators are consistent with the characteristics of the study area presented in NEPA documentation for the Previous Design.

The demographic indicators of limited English proficiency and zero-car households remain higher in the study area than in Durham and Orange counties overall, and the under age 18/over age 65 population remains lower than in the surrounding counties overall.

Table 5-1: Socioeconomic and Demographic Indicators

Evaluation Area	2012 - 2016 ACS Est. Limited English Proficiency (%)	2012 - 2016 ACS Est. Zero-Car Households (%)	2012 - 2016 ACS Est. Under 18/Over 65 (%)
1_ UNC Campus Area	7	7	9
2_ East Chapel Hill	2	2	34
3_ Leigh Village	1	2	26
4_ US 15-501 Corridor	9	9	30
5_ Duke West Campus & Medical Center	12	18	17
6_ Old West Durham / Duke East Campus	4	17	17
7_ Downtown Durham	4	23	29
8_ East Durham	6	24	33
Proposed Refinements Study Area Total	7	14	24
Durham County	5	8	33
Orange County	3	5	32

5.5 Environmental Consequences

The effects of the Proposed Refinements on demographic and socioeconomic conditions in the study area would be the same as described in the NEPA documentation for the Previous Design. The Proposed Refinements are proposed to be constructed and operated in the same general location as the Previous Design; therefore, the effect of the Proposed Refinements on property tax base and regional employment would be essentially the same as those effects presented in the NEPA documentation for the Previous Design.

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