Appendix G
Air Quality Analysis

FINAL REPORT

Hooper Road (LA 408) Project from Blackwater Road to Sullivan Road

City/Parish Project No. 12-CS-HC-0017
State Project No. H.002316/H.002317

Air Quality Analysis

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Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
AADT	annual average daily traffic
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CRPC	Capital Region Planning Commission
DOTD	Louisiana Department of Transportation and Development
EIS	environmental impact statement
EPA	United States Environmental Protection Agency
FHWA	Federal Highway Administration
FR	Federal Register
FTA	Federal Transit Administration
LDEQ	Louisiana Department of Environmental Quality
LOS	Level of Service
mg/m^3	milligrams per cubic meter
MPO	Metropolitan Planning Organization
MSAT	mobile source air toxics
N/A	not applicable
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NOx	nitrogen oxides
O_3	ozone
Pb	lead
PM	particulate matter
PM_{10}	inhalable particulate matter

$PM_{2.5}$	fine particulate matter
ppb	parts per billion
ppm	parts per million
SIP	State Implementation Plan
SO_2	sulfur dioxide
TIP	Transportation Improvement Plan
USC	United States Code
VMT	vehicle miles traveled
VOC	volatile organic compound

Section 1

Introduction

The proposed Hooper Road (LA 408) Project between Blackwater Road and Sullivan Road is described below. Subsequent sections discuss the applicable regulations and air quality impact analysis for the proposed project.

1.1 Project Desciption

The Hooper Road (LA 408) Project between Blackwater Road and Sullivan Road is located in Central, Louisiana in East Baton Rouge Parish. The segment from 2,800 feet to the east of Blackwater Road to just west of Sullivan Road is currently a two-lane roadway, while Hooper Road to the east and west of this segment is a four-lane divided roadway. The goal of the project is to provide an additional through-traffic lane in each direction and a raised median to increase capacity and to improve safety. Hooper Road is a state highway and is subject to Louisiana Department of Transportation and Development (DOTD) design requirements. The project is included in the East Baton Rouge Parish Green Light Plan.

The proposed project has five alternatives:

- Alternative A – North Widening. This alternative will widen Hooper Road to the north.
- Alternative B – South Widening. This alternative will widen the Hooper Road to the south.
- Alternative C – Centered Rebuild. This alternative will use the existing centerline and will widen to the north and south.
- Alternative D – Hybrid (combination of Alternatives A and C) with sidepaths.
- Alternative E – Hybrid (combination of Alternatives A and C) without sidepaths.

All alternatives will upgrade and/or replace the existing roadway, where necessary. 30-foot and 16-foot raised median options are being considered for Alternatives A through C. A 16-foot median is included in Alternatives D and E. A curb and gutter roadway with sidewalks, sewers, and subsurface drainage improvements are proposed.

The Preferred Alternative, Alternative E, is a combination of elements found in Alternatives A and C. Between Blackwater Road and Joor Road, the proposed project would widen symmetrically to the north and south from the existing centerline, similar to Alternative C. Between Joor Road and Shoe Creek Drive, the proposed project would have a northern offset, similar to Alternative A. East of Shoe Creek Drive would also widen symmetrically from the existing centerline, like Alternative C. A 16-feet wide raised median option is included in this Preferred Alternative. Potential noise impacts from the Preferred Alternative are discussed based on the analysis conducted for the 30-foot median option for Alternatives A, B, and C. Alternative D would have the same roadway alignment as Alternative E.

1.2 Traffic Volumes in the Study Area

The existing (2013) and design year (2037) annual average daily traffic (AADT) volumes in the study area are shown in **Table 1-1**. The highest traffic volume on Hooper Road in the study area occurs near the Sullivan Road intersection, according to field observations; **Table 1-1** shows the traffic volumes on Hooper Road to the west of Sullivan Road. Traffic volume is expected to grow over 160 percent from existing levels to 2037. This section of Hooper Road has a Level of Service (LOS) of E, which is characterized by unstable operation and significant delay. Although at project completion (2017) the LOS is expected to improve to C/D, by 2037 the LOS is expected to be E because of regional vehicle volume increase.

Table 1-1 Annual Average Daily Traffic in the Study Area

Roadway Segment	Existing (2013) AADT	Design Year (2037)	
		AADT	% Change from No Build
Hooper Road (West of Sullivan Road)	15,483	24,903	161%

Source: CDM Smith, 2014.

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Section 2

Regulatory Framework

Air quality management and protection responsibilities exist in federal, state, and local levels of government. The federal Clean Air Act (CAA) is the primary statue that establishes ambient air quality standards and establishes regulatory authorities to enforce regulations designed to attain those standards. The United States Environmental Protection Agency (EPA) is responsible for implementation of the CAA. The CAA was enacted in 1955 and was amended in 1963, 1965, 1967, 1970, 1977, 1990, and 1997. Louisiana Department of Environmental Quality (LDEQ) operates the air quality monitoring program, implements the permit program, and works with Metropolitan Planning Organizations (MPOs) and the DOTD for transportation planning.

2.1 Criteria Pollutants

EPA regulates seven common pollutants called criteria pollutants. They include carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and sulfur dioxide (SO_2). Each pollutant is described below.

Carbon Monoxide

CO is a colorless, odorless gas that is highly toxic. It is formed by the incomplete combustion of fuels. In East Baton Rouge Parish, over 75 percent of CO emissions occur from mobile sources (EPA 2014a). Exposure to CO can reduce the body's ability to carry oxygen. CO exposure can cause people with several types of heart disease to experience chest pain (angina) when exercising or under increased stress. Extremely high levels of CO can cause death (EPA 2012c).

Lead

Lead is a soft and chemically resistant metal that is naturally found in the environment. It has historically been found in motor vehicles and industrial sources, which lead to the EPA's efforts to remove Pb from gasoline in 1980 and beyond. The aviation sector continues to be a major source of Pb emissions from piston aircraft, as are certain industrial sectors like ore and metals processing (EPA 2012b). Emissions of Pb from the study area are minimal (EPA 2014a).

In addition to Pb exposure through air, Pb can also accumulate in soils and other sediments, especially in urban environments where it would have accumulated from years of exposure from leaded gasoline. Lead exposure can adversely affect the nervous system, kidney function, immune system, reproductive and development systems, and the cardiovascular system. Lead exposure may also contribute to behavioral problems, learning deficits, and lowered IQ in infants and young children (EPA 2012a).

Nitrogen Dioxide

NO_2 is a reddish-brown to dark brown reactive gas that is formed during high-temperature combustion processes, such as those occurring in engines and power plants. The sum of nitric oxide and NO_2 is commonly called nitrogen oxides (NOx), but other oxides like nitrous oxide and nitric acid are also classified as NOx. Mobile sources (46 percent) and fuel combustion (35 percent) are the main sources of NOx in East Baton Rouge Parish (EPA 2014a).

Exposure to NO_2 can cause adverse respiratory effects including airway inflammation. NOx can react with ammonia, moisture, and other compounds to form small particles that can lodge deeply into sensitive parts of the lungs. This action can cause or worsen respiratory disease like emphysema and bronchitis or can aggregative existing heart disease (EPA 2013a).

Ozone

O_3 is a highly reactive and unstable gas that is formed in the atmosphere through complex reactions with sunlight, NOx, and volatile organic compounds (VOCs). Hot, sunny, and calm days promote O_3 formation. The EPA regulates ground-level O_3, which is not to be confused with stratospheric O_3. Ground-level O_3 is close to where people live, breathe, and exercise and can cause adverse health effects; stratospheric O_3 is high in the atmosphere and reduces the amount of ultraviolet light entering the earth's atmosphere, which actually helps protect animal and plant life.

Certain people are particularly sensitive to the effects of O_3 including people with lung disease, children, older adults, and active people. Generally, as O_3 concentrations increase, both the number of people affected and the seriousness of the health effects increase. The effects of exposure to ground-level O_3 include cough, chest tightness, and pain upon taking a deep breath; worsening of wheezing and other asthma symptoms; reduced lung function; and increase hospitalizations for respiratory causes.

O_3 also has detrimental effects on the environment. O_3 exposure can damage cells and leaf tissue, reducing plants' ability to photosynthesize and produce food. Plants will grow more leaves in an attempt to produce more food, but this response has the net effect of making plants more susceptible for disease, pests, cold, and drought. O_3 can also damage materials like rubber, plastics, fabrics, paint and metals (EPA 2003; EPA 2009). Only about 14 percent of East Baton Rouge Parish's VOC emissions come from mobile sources (EPA 2014a).

Particulate Matter

Particulate matter (PM) consists of solid and liquid particles of dust, soot, aerosols, and other matter small enough to remain suspended in the air for a long period of time. PM is divided into two size classes of particles: particles up to 10 microns[1] (PM_{10}) and particles up to 2.5 microns ($PM_{2.5}$). To place the sizes in perspective, a human hair is approximately 60 microns in diameter, which makes it six times larger than the largest coarse particle and over 20 times larger than the largest fine particle.

Primary particles are those that are directly emitted from a source, such as construction sites, unpaved roads, fields, smokestacks, or fires. Burning fuels primarily produces $PM_{2.5}$, while other sources like windblown dust contribute to PM_{10} emissions. Secondary formation of $PM_{2.5}$ can occur from complex reactions in the atmosphere of pollutants like NOx, sulfur oxides, VOCs, and ammonia. Most of the $PM_{2.5}$ pollution in the United States occurs from these secondary reactions as opposed to direct (primary) emissions. More than half of PM_{10} in East Baton Rouge Parish is attributed to dust. Main sources of $PM_{2.5}$ in East Baton Rouge Parish are industrial processes and fuel combustion (EPA 2014a).

Particles smaller than 10 microns (i.e., PM_{10} and $PM_{2.5}$) represent that portion of PM thought to represent the greatest hazard to public health because they can become deeply embedded in someone's lungs. This can lead to adverse health effects including premature death in people with

[1] A micron is a unit of measurement that is one-millionth of a meter. A meter is slightly larger than 3 feet.

heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms (e.g., irritation of the airways, coughing, or difficulty breathing). Aside from adverse health effects, $PM_{2.5}$ is primarily responsible for reduced visibility (haze) in the United States. PM can also cause aesthetic damage by staining or damaging stone and other materials (EPA 2013c; EPA 2014b).

Sulfur Dioxide

SO_2 is formed when locomotives, ships, and non-road diesel equipment burn sulfur-containing fuel. Certain industrial processes, such as petroleum refining and metal processing, also contribute to SO_2 emissions. Industrial processes account for most emissions of SO_2 in East Baton Rouge Parish (EPA 2014a). Health effects of SO_2 exposure including bronchoconstriction and increased asthma symptoms. SO_2 can also react with other compounds in the atmosphere to form small particles. Exposure to the resulting particles can aggravate existing heart disease, leading to increased hospital admissions and premature death (EPA 2013c).

2.2 National Ambient Air Quality Standards

Under authority of the CAA, EPA established the National Ambient Air Quality Standards (NAAQS) for CO, Pb, NO_2, O_3, PM_{10}, $PM_{2.5}$, and SO_2. **Table 2-1** presents the current NAAQS for the criteria pollutants. The federal CAA requires states to classify air quality control regions (or portions thereof) as either attainment or nonattainment with respect to criteria air pollutants, based on whether the NAAQS have been achieved.

2.3 Attainment Status

Areas that exceed the NAAQS are designated as nonattainment. Areas that previously exceeded the NAAQS, but have since attained the standard, are called maintenance areas. States are also required to prepare State Implementation Plans (SIPs) containing emission reduction strategies to maintain the NAAQS for those areas designated as maintenance and to attain the NAAQS for those areas designated as nonattainment.

Certain pollutants, namely O_3 and PM_{10}, are further subdivided based on how close an area is to achieving the NAAQS. The possible classifications for the O_3 NAAQS are marginal, moderate, serious, severe, or extreme. Areas with worse classifications are given more time to attain the NAAQS than areas with better air quality. For example, an area classified as an extreme nonattainment area has an attainment date of December 31, 2032 (20 years from the date of designation), while an area classified as a marginal nonattainment area has until December 31, 2015 to attain the NAAQS (77 Federal Register [FR] 30160). The possible classifications for the PM_{10} NAAQS are moderate and serious. Section 188 of the CAA (42 United States Code [USC] 7513) states that all areas designated nonattainment for the PM_{10} NAAQS are to be initially classified as moderate; however, an area can be reclassified as serious if the EPA determines that the area cannot practicably attain the standard by the attainment date.

Table 2-1 National Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS Primary	NAAQS Secondary	Violation Criteria
CO	1 Hour	35 ppm (40 mg/m^3)	N/A	Not to be exceeded more than once per year
	8 Hour	9 ppm (10 mg/m^3)		
NO_2	1 Hour	100 ppb (188 µg/m^3)	N/A	98th percentile of 1-hour daily maximum concentrations, averaged over three years
	Annual	53 ppb (100 µg/m^3)	Same as Primary Standard	Annual mean
O_3	8 Hour (2008)	0.075 ppm (147 µg/m^3)	Same as Primary Standard	Annual fourth-highest daily maximum 8-hour concentration, averaged over three years
Pb	Rolling 3-Month Average	0.15 µg/m^3	Same as Primary Standard	Not to be exceeded
PM_{10}	24 Hour	150 µg/m^3	Same as Primary Standard	Not to be exceeded more than once per year on average over three years
$PM_{2.5}$	24 Hour	35 µg/m^3	Same as Primary Standard	98th percentile, averaged over three years
	Annual	12 µg/m^3	12 µg/m^3	Annual mean, averaged over three years
SO_2	1 Hour	75 ppb (196 µg/m^3)	N/A	99th percentile of 1-hour daily maximum concentrations, averaged over three years
	3 Hour	N/A	0.5 ppm (1,300 µg/m^3)	Not to be exceeded more than once per year
	24 Hour	0.14 ppm (366 µg/m^3) (1)	N/A	Not to be exceeded more than once per year
	Annual	0.030 ppm (79 µg/m^3) (1)		Annual mean

Source: EPA 2012d; 40 CFR 50.

Notes:

(1) On June 22, 2010, the 24-hour and annual primary SO_2 NAAQS were revoked (75 Federal Register [FR] 35520). The 1971 SO_2 NAAQS (0.14 parts per million [ppm] and 0.030 ppm for 24-hour and annual averaging periods) remain in effect until one year after an area is designated for the 2010 1-hour primary standard. EPA has designated parts of 16 states as nonattainment based on 2009-2011 monitoring data, effective October 4, 2013, but deferred action on all other areas (78 FR 47191). LDEQ recommended to EPA on May 26, 2011 that East Baton Rouge Parish be designated as in attainment (LDEQ 2011). EPA has not designated attainment status for East Baton Rouge Parish.

Key:

µg/m^3 = micrograms per cubic meter; CO = carbon monoxide; mg/m^3 = milligrams per cubic meter; N/A = not applicable; NAAQS = National Ambient Air Quality Standard; NO_2 = nitrogen dioxide; O_3 = ozone; Pb = lead; PM_{10} = inhalable particulate matter; $PM_{2.5}$ = fine particulate matter; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide

The study area is within East Baton Rouge Parish, which is in attainment of CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$ and Pb (EPA 2013e). The Parish was designated as in marginal nonattainment of the 2008 8-hour O_3 standard, effective July 20, 2012, and is required to attain the standard by December 31, 2015. The previous 1997 8-hour O_3 standard was revoked a year after the 2008 8-hour ozone designations became effective. However, maintenance obligations remain in place (70 FR 44470). East Baton Rouge Parish was redesignated as in attainment of the 1997 8-hour O_3 standard, effective December 30, 2011, and the area has an EPA approved maintenance plan through 2022.

Criteria air pollutants are monitored at five stations in East Baton Rouge Parish. The most recent three years of available data (2011-2013) from the Baton Rouge-Capitol station (Site ID 220330009; 1061-A Leesville Avenue, Baton Rouge, LA) are summarized in **Table 2-2**.

Table 2-2 Ambient (Background) Air Quality Data

Pollutant [1]	NAAQS	2011	2012	2013	Design Value (2011-2013)
CO					
Maximum 1-hour concentration (ppm)	35	1.8	2.2	2.1	N/A
Maximum 8-hour concentration (ppm)	9	1.5	1.9	2	N/A
Number of days exceeding 1-hour standard		0	0	0	
Number of days exceeding 8-hour standard		0	0	0	
Pb [2]					
Maximum 24-hour concentration (µg/m^3)	--	0.003	0.009	0.005	--
NO_2					
98th percentile 1-hour concentration (ppb)	100	56	51	48	52
Number of days exceeding 1-hour standard		0	0	0	
O_3					
4th high 8-hour concentration (ppm)	0.075	0.080	0.072	0.066	0.073
Number of days exceeding 2008 8-hour standard		5	2	0	
PM_{10}					
Maximum 24-hour concentration (µg/m^3)	150	74	76	81	N/A
Number of days exceeding 24-hour standard		0	0	0	
$PM_{2.5}$					
98th percentile 24-hour concentration (µg/m^3)	35	23	22	20	22
Annual mean (µg/m^3)	15	10.1	9.8	8.4	9.4
Number of days exceeding 24-hour standard		0	0	0	
SO_2 [3]					
99th percentile 1-hour concentration (ppb)	75	31	32	21	28
24-hour concentration (ppb)	140	17	37	48	--
Number of days exceeding 1-hour standard		0	0	0	
Number of days exceeding 24-hour standard		0	0	0	

Source: EPA 2013d.

Notes:

[1] An exceedance is not necessarily a violation. Violations are defined in 40 Code of Federal Regulations (CFR) 50. Data from 1061-A Leesville Ave, Baton Rouge, LA (Site ID 220330009).

[2] 3-month average statistics were not available from the EPA.

[3] 3-hour and annual average SO_2 concentrations were not available from EPA.

Key:

-- = There was insufficient (or no) data available to determine this value; µg/m^3 = micrograms per cubic meter; CO = carbon monoxide; N/A = not applicable; NAAQS = National Ambient Air Quality Standard; NO_2 = nitrogen dioxide; O_3 = ozone; Pb = lead; PM_{10} = inhalable particulate matter; $PM_{2.5}$ = fine particulate matter; ppm = parts per million; SO_2 = sulfur dioxide

2.4 Transportation Conformity

Approval, funding, or implementation of Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) projects is subject to the transportation conformity regulations under the CAA

(40 Code of Federal Regulations [CFR] 93 Subpart A). Each metropolitan planning area is required to develop an official metropolitan transportation plan pursuant to 23 CFR Part 450. If a potential project is included in a transportation plan and transportation improvement program (TIP) that conform to the SIP and the CAA and its amendments, then the project is already included in the emission budgets developed for the region. Thus, a unique, regional analysis of project emissions would not be required; however, analysis regarding possible localized impacts is still required. The MPO, or the Capital Region Planning Commission (CRPC), in the study area, is responsible for transportation planning and determining regional conformity.

In order for a FHWA/FTA project to be found to conform, regardless of whether it is in a conforming transportation plan or TIP or not, the following criteria and procedures must be followed:

- §93.110 – The conformity determination must be based upon the most recent planning assumptions in force at the time the conformity analysis begins.
- §93.111 – The conformity determination must be based on the latest emission estimation model available.
- §93.112 – Conformity must be determined according to the consultation procedures in 40 CFR 93 Subpart A.
- §93.114 – There must be a currently conforming transportation plan and currently conforming TIP at the time of project approval.
- §93.116 – The project must not cause or contribute to any new localized CO, PM_{10}, and/or $PM_{2.5}$ violations or increase the frequency of severity of any existing CO, PM_{10}, and $PM_{2.5}$ violations.
- §93.117 – The project must comply with any PM_{10} and $PM_{2.5}$ control measures in the applicable SIP.

Transportation conformity applies to nonattainment and maintenance areas. Because the study area is in maintenance for the 1997 8-hour O_3 standard and is designated as nonattainment of the 2008 O_3 standard, transportation conformity regulations apply. However, the 1997 O_3 NAAQS was revoked for transportation conformity purposes a year after the effective date of designations for the 2008 O_3 NAAQS. As of July 20, 2013, transportation conformity requirements do not apply to the 1997 O_3 NAAQS (77 FR 30160).

The project is included in the *Air Quality Conformity Analysis of the Metropolitan Transportation Plan 2037 and Transportation Improvement Program 2013-2017 for the Baton Rouge Ozone Non-Attainment Area* (CRPC 2013). This document was approved by EPA on July 12, 2013 and by FHWA on July 17, 2013. The project would only need to consider localized project-level impacts.

2.5 Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources (e.g., cars and trucks), non-road mobile sources (e.g., airplanes and construction equipment), area sources (e.g., dry cleaners) and stationary sources (e.g., factories, refineries, and power plants). EPA has also recognized emissions of air toxics from mobile sources as a potential environmental and health concern. The interim guidance released by FHWA dated February 2007 requires discussion of Mobile Source Air

Toxics (MSATs) in National Environmental Policy Act (NEPA) documents. The guidance was updated in September 2009 and December 2012.

The current guidance on MSATs is FHWA's *Interim Guidance Update on Air Toxic Analysis in NEPA Documents*, released on December 6, 2012. This guidance advises on when and how to analyze MSATs in the NEPA process for highway projects. This guidance is interim because MSAT science is still evolving. Currently, there are limitations on tools and techniques for evaluating potential project-level health risks from MSAT exposure. FHWA regularly updates the guidance based on new scientific data.

Section 3

Impact Analysis

Impacts of the proposed project to the air quality in the study area are discussed in this section.

3.1 Vehicle Emissions

The impact resulting from a new transportation project ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new roadway or an existing highway facility.

3.1.1 Criteria Pollutants

Motor vehicles emit CO, NOx, VOC, PM_{10}, $PM_{2.5}$, SO_2, and Pb (listed in order of decreasing emission rate). Emissions of criteria pollutants as a result of the implementation of the project are discussed below.

Carbon Monoxide

Motor vehicles are considered a main source of CO in the study area (EPA 2014a). CO levels measured in East Baton Rouge Parish are well below the NAAQS, and this project is not expected to produce a projected violation of the CO NAAQS.

Projects in attainment areas would still be required to conduct a CO hotspot analysis if the project is expected to adversely affect intersections that are at LOS D, E, or F or those that would change the LOS of an intersection to D, E, or F due to increased traffic volumes related to the project (40 CFR 93.123). Although the project affects intersections with a current LOS of E, the project is designed to increase capacity to accommodate future growth in regional traffic volume. The proposed action is not anticipated to increase traffic volumes or cause adverse impacts on intersections and local air quality; therefore, no additional project-level analysis is required.

Ozone, Volatile Organic Compounds, and Nitrogen Dioxide

Motor vehicles are regarded as common sources of VOC and NOx. VOC and NOx emitted from vehicles are carried into the atmosphere where they react with sunlight to form O_3 and NO_2. Automotive emissions of VOC and NOx are expected to decrease in the future because of the continued installation and maintenance of pollution control devices on new cars. However, regarding area-wide emissions, these technological improvements may be offset by the increasing number of cars in the area.

The photochemical reactions that form O_3 and NO_2 require several hours to occur. For this reason, the peak levels of O_3 generally occur ten to twenty kilometers (approximately 6 to 12 miles) downwind of the source of VOC emissions. Urban areas as a whole are regarded as sources of VOC, not individual streets and highways. The emissions of all sources in an urban area mix in the atmosphere, and, in the presence of sunlight, this mixture reacts to form O_3, NO_2, and other photochemical oxidants. The project is located in a marginal nonattainment area for O_3. This project is not expected to cause adverse impact on O_3 or NO_2 concentrations.

Particulate Matter and Sulfur Dioxide

Motor vehicles are not regarded as significant sources of PM_{10}, $PM_{2.5}$, and SO_2. Nationwide, highway sources account for less than 7 percent of PM emissions and less than 2 percent of SO_2 emissions. PM_{10}, $PM_{2.5}$, and SO_2 emissions are predominantly the result of non-highway sources (e.g., industrial, commercial, and agricultural). Because emissions of PM_{10}, $PM_{2.5}$, and SO_2 from automobiles are very low and current monitored levels are well below the NAAQS, the traffic on the project will not cause air quality standards for PM_{10}, $PM_{2.5}$, and SO_2 to exceed the NAAQS.

Projects that have a significant number of diesel vehicles, are anticipated to significantly increase the number of diesel vehicles, are anticipated to affect intersections that are LOS D, E, or F, or are anticipated to change the LOS of an intersection to D, E, or F are required to conduct a hotspot analysis (40 CFR 93.123). Projects that involve bus and rail terminals and facilities with AADT greater than 125,000, where 8 percent or more of that AADT is diesel trucks, are often subject to this requirement due to an increase in diesel use (71 FR 12468). An interagency consultation process would be needed to determine if a project would require PM_{10} and $PM_{2.5}$ hot-spot analyses. The project is not in a nonattainment area for $PM_{2.5}$ and is not expected to cause a significant increase in the number of diesel vehicles. Therefore, a $PM_{2.5}$ hotspot analysis is not required.

Lead

Automobiles without catalytic converters can burn regular gasoline. The burning of regular gasoline emits Pb as a result of regular gasoline containing tetraethyl lead, which is added by refineries to increase the octane rating of the fuel. Cars with catalytic converters burn unleaded gasoline, thereby eliminating Pb emissions. Also, the EPA has required the reduction in the Pb content of leaded gasoline. The overall average Pb content of gasoline in 1974 was approximately 0.53 gram per liter. By 1989, this composite average had dropped to 0.003 grams per liter. The CAA Amendments of 1990 made the sale, supply, or transport of leaded gasoline or Pb additives unlawful after December 31, 1995. Because of these reasons, it is not expected that traffic on the proposed project will cause the NAAQS for Pb to be exceeded.

Hooper Road Emissions

NEPA requires project emissions to be compared to the future No-Build conditions (i.e. 2037 emissions without the project). Future traffic volume on Hooper Road is expected to be similar with or without the project. Without the project, Hooper Road would experience more congestion and localized emissions from idling vehicles. Compared to the No-Build condition, the Build condition emissions are anticipated to be similar or less.

3.1.2 Mobile Source Air Toxics

Motor vehicles contribute significantly to emissions of acrolein, benzene, 1,3-butadiene, diesel PM (including diesel exhaust organic gases), formaldehyde, naphthalene and polycyclic organic matter. Of these compounds, FHWA considers diesel PM as the dominant MSAT of concern.

The FHWA has developed a tiered approach for analyzing MSATs in NEPA documents, depending on the specific project circumstances:

- No analysis for projects with no potential for meaningful MSAT effects;
- Qualitative analysis for projects with low potential MSAT effects; or

- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

The proposed project involves widening of a state highway. As shown in **Table 1-1**, the design year AADT for the proposed connection is projected to be less than 140,000 to 150,000 vehicles per day, which is the FHWA criterion for a qualitative analysis; the project is expected to have low potential MSAT effects.

Vehicle mix is not anticipated to change due to this project; therefore, MSATs emitted would be proportional to the vehicle miles traveled (VMT). **Table 3-1** shows the estimated daily VMT for this project. Also, speed may increase due to additional capacity, increasing the efficiency of the transportation network.

Table 3-1 Estimated Daily Vehicle Miles Traveled

	Existing (2013)	Design Year (2037)
Project VMT (miles)	43,106	69,332

Note: VMT calculated based on corridor length (14,700 ft) and AADT presented in Table 1-1.

Emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turn over, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great, even after accounting for VMT growth, that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

MSAT science is still evolving and the available technical tools do not enable the EPA to predict the project-specific health impacts of the emission changes associated with the alternative evaluated in the Environmental Impact Statement (EIS). Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22) regarding incomplete or unavailable information.

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation, rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute.

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts -- each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments,

particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that timeframe, since such information is unavailable. It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds and, in particular, for diesel PM.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities, plus improved access for emergency response, that are better suited for quantitative analysis.

3.2 Construction Emissions

Heavy construction equipment, including excavators, scrapers, graders, rollers, compactors, and pavers, may be used to clear and grub, excavate, grade, and pave for construction of new roadways. Contractors will be responsible for maintaining, repairing, and adjusting all construction equipment to keep them in full satisfactory condition to minimize pollutant emissions. Equipment emissions may be reduced by using newer, lower-emitting equipment, retrofitting older equipment engines, and controlling activity.

Measures should be taken to reduce any fugitive dust generated by construction activities. A dust control plan may be prepared to outline control methods specific to the construction site. Dust control methods may include watering areas of disturbance, covering haul trucks, stabilizing or covering stockpile areas, washing equipment to minimize track out, and reducing speeds on unpaved roads.

Section 4

Conclusions

The study area is located in East Baton Rouge Parish, which is in attainment of CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$ and Pb (EPA 2013e). The proposed project is within the Baton Rouge nonattainment area for 2008 O_3 NAAQS and is in maintenance of the 1997 8-hour O_3 standard.

Transportation conformity applies to nonattainment and maintenance areas. However, the 1997 O_3 NAAQS was revoked for transportation conformity purposes as of July 20, 2013; therefore, transportation conformity requirements do not apply to the 1997 O_3 NAAQS. East Baton Rouge Parish is in nonattainment of the 2008 O_3 NAAQS; therefore, transportation conformity applies to the 2008 O_3 NAAQS. The project is included in the EPA and FHWA approved air quality conformity analysis, *Air Quality Conformity Analysis of the Metropolitan Transportation Plan 2037 and Transportation Improvement Program 2013-2017 for the Baton Rouge Ozone Non-Attainment Area* (CRPC 2013), thus a regional analysis is not required.

The project does not involve a significant number of diesel vehicles and is not anticipated to significantly increase the number of diesel vehicles, adversely affect intersections that are LOS D, E, or F, or change the LOS of an intersection to D, E, or F. Therefore, the project would not be required to conduct a project-level hotspot analysis for CO or PM.

No significant MSAT impacts are anticipated from this project. Air toxics analysis is a continuing area of research. At this time, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited.

Emissions from construction of the proposed project should be minimized using newer, lower-emitting equipment, retrofitting older equipment engines, controlling equipment activity and by implementing a dust control plan.

Section 5

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