

Air Quality Analysis Technical Report

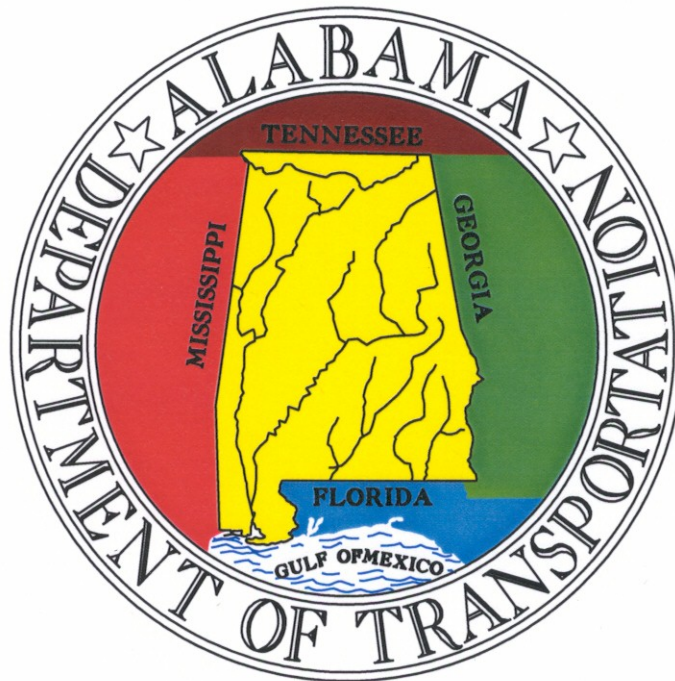
For

Project No. STPBH-7012(602)

*Additional Lanes on CR-52 East from US-31 to I-65 Ramps
Shelby County, Alabama*

Prepared For:

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Figure 1: Project Map with Intersection Locations

Project No. STPBH-7012(602)
Additional Lanes on CR-52 East from US-31 to I-65 Ramps
Shelby County, Alabama

1 Purpose

AECOM analyzed the air quality impacts for the existing and build conditions for roadway improvements for project STPBH-7012(602). The improvements are located within the City of Pelham, North Shelby County, along CR-52 from I-65 @ Exit #242 west to US-31(Pelham Parkway) and on US-31 corridor from Yeager Parkway to south of the CSX Railroad/Peavine Creek Bridge. The purpose of this project is to provide an improved facility to accommodate existing and projected traffic along CR-52 East between I-65 and SR-3 (US-31) and along SR-3 (US-31) between CR-52 East and CR-52 West.

This air quality analysis evaluates whether National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO) would be exceeded at receptor locations along the proposed project. The primary standard for CO, ozone (O₃), particulate matter (PM) 2.5, and PM-10 was designed by the Environmental Protection Agency (EPA) to protect against adverse health effects.

The project is located within Shelby County which was designated pursuant to the Clean Air Act Amendments of 1990 in attainment for CO, O₃, and PM-10. Therefore, no transportation control measures are required under the State Implementation Plan (SIP). This attainment classification was made on May 27, 1998.

2 Project Description

The project study area is in the City of Pelham, Alabama, in Shelby County and provides a transportation link to I-65 as well as many commercial and residential areas (Figure 1).

Proposed improvements include the following phases:

Phase I

- CR-52 westbound at US-31 will be widened to allow for dedicated right-turn lane.
- Word Drive westbound at US-31 will be widened and restriped to increase storage of right turn lane.
- CR-33 southbound at CR-52 will be restriped to allow for one left-turn lane and one shared left/right turn lane.
- CR-52 will be widened to allow for an additional westbound free-flow lane from the I-65 ramps to US-31.

- US-31 northbound bridge just south of CR-52 will be widened to allow for one thru lane, one shared thru/right lane and a continuous free flow right-turn lane to CR-52 eastbound.
- ‘U-turn’ at a new intersection south of the US-31 bridges over CSX Railroad/Peavine Creek.

Phase II

- Future ‘U-turn’ north of the US-31/CR-52/Word Drive intersection near Yeager Parkway.

3 Carbon Monoxide (CO)

This project was evaluated for CO using FHWA’s 2017 CO Categorical Hotspot Finding Tool(https://www.fhwa.dot.gov/environment/air_quality/conformity/policy_and_guidance/cmcf_2017/). FHWA’s CO Categorical Hot-Spot Memo and Finding is located on the FHWA’s CO Categorical Hot-Spot webpage and includes a comprehensive discussion about the use of the CO categorical hot-spot finding.

The intersection of US-31 and County Road 52 West is a perpendicular intersection and has the highest design hourly traffic volume (3534 DHV) at the worst level of service (LOS C). Therefore, this intersection has been chosen as a representative intersection for this project. The results of this intersection are considered the worst case for the project corridor.

As described in the finding, the 2017 CO categorical hot-spot finding meets the requirements under Clean Air Act section 176(c)(1)(B) and the transportation conformity rule at 40 CFR Part 93, Subpart A by showing that the project modeled would not cause or contribute to new or worsened air quality violations or delay timely attainment or any required interim emission reductions or milestones. AECOM evaluated if this finding is applicable to this project, as explained below. The modeling, analysis, documentation, and coordination activities to support the CO categorical hot-spot finding were conducted following the conformity rule’s requirements at 40 CFR 93.123(a)(1) and (c), as well as EPA’s guidance documents “Using MOVES2014 in Project-Level Carbon Monoxide Analyses” (EPA-420-B-15-028, March 2015) and “Guideline for Modeling Carbon Monoxide from Roadway Intersections” (EPA-454-R-92-005, Nov. 1992). A detailed discussion of the modeling and analysis is documented in FHWA’s CO Categorical Hot-Spot Finding Technical Report. Key modeling assumptions from the technical analysis are summarized below.

As described in Section 2 of the CO Categorical Hot-Spot Finding Technical Report (see https://www.fhwa.dot.gov/environment/air_quality/conformity/policy_and_guidance/cmcf_2017/technical_document.pdf), the goal of the analysis was to model a large intersection operating at capacity using MOVES2014a and CAL3QHC so that projects meeting the finding's parameters would not produce a CO concentration higher than what was modeled and, when combined with background concentrations, would not violate the

NAAQS for CO. It is important to note that background concentrations would be based on the particular project location following EPA's "Guideline for Modeling Carbon Monoxide from Roadway Intersections." Table 1 in Section 2 describes the intersection parameters that were modeled as part of the CO categorical hot-spot finding work. As discussed in the report, these parameters set the range of traffic data values that a project must meet to rely on the CO categorical hot-spot finding.

Because all traffic data values for the project intersection analyzed for CO are within the acceptable range of modeled parameters for the CO categorical hot-spot finding (see Attachment 1 for the results of the Carbon Monoxide Categorical Hot-Spot Finding Tool and Attachment 2 for the traffic diagrams), it was concluded that the CO concentrations for the project intersection would not exceed state or federal air quality standards through the design year based on the given traffic predictions. Therefore, this project is consistent with region wide air quality goals and is consistent with the SIP for air quality.

To minimize potential air quality impacts from particulate matter during project construction, the contractor shall follow procedures in the ALDOT publication "Standard Specifications for Highway Construction."

Project STPBH-7012(602) is included in the ALDOT Five Year Plan for Plan 2019 and the FY 2020-2023 Transportation Improvement Program (TIP) of the Regional Planning Commission of Greater Birmingham. The project is in an area designated to be in attainment with the 8-hour ozone standard in accordance with the National Ambient Air Quality Standards. Transportation Control Measures do not apply.

4 PM 2.5

On January 5, 2005, EPA announced nonattainment designations for those areas that exceeded the health-based standards for PM 2.5. At that time, Shelby County was designated as nonattainment for PM 2.5. The designation and classification took effect on April 5, 2005. Since the one year grace period provided by the Clean Air Act ended on April 5, 2006, transportation conformity for the PM 2.5 standards now applies. Metropolitan PM 2.5 nonattainment areas are now required to have a transportation improvement program (TIP) and long range transportation plan (LRTP) that conform to the PM 2.5 standard.

The final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in PM 2.5 nonattainment and maintenance areas was published on March 10, 2006. The proposed project is in Shelby County, which is within a designated nonattainment area for PM 2.5. *Transportation Conformity Guidance for Qualitative Hot-spot Analysis in PM 2.5 and PM 10 Nonattainment and Maintenance Areas*, circulated on March 29, 2006, outlines how to conduct qualitative PM 2.5 hot-spot analyses for "projects of air quality concern," as defined in 40 CFR 93.123(b)(1).

Projects of air quality concern are highway and transit projects that involve significant levels of diesel traffic, or any project that is identified as a localized air quality concern by the PM 2.5 State Implementation Plan (SIP).

The guidance also notes that a qualitative PM 2.5 hot-spot analysis is not required for projects that are not an air quality concern, but states that the project-level conformity determination should document that the Clean Air Act and 40 CFR 93.116 requirements were met without a hot-spot analysis, since the project has been found to not be of air quality concern under 40 CFR 93.123(b)(1).

The guidance also provides examples of projects that would and would not be considered projects of air quality concern. Project STPBH-7012(602) was compared with the examples provided in the guidance to determine whether it should be considered a project of air quality concern and would require a qualitative PM 2.5 hot-spot analysis.

Comparing Project STPBH-7012(602) with examples of projects considered “projects of air quality concern” (that would be covered by 40 CFR 93.123(b)(1) and would require a qualitative PM 2.5 hot-spot analysis) shows that this project is not a “project of air quality concern”. The construction of Project STPBH-7012(602) does not result in a significant increase in the number of diesel engines in the area.

Project STPBH-7012(602) does compare favorably to an example of a project that would not be covered under 40 CFR 93.123(b)(1). The guidance states that “any new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in number of diesel vehicles), including such projects involving congested intersections operating at Level-of-Service D, E, or F” is an example of a project that is not an air quality concern under 40 CFR 93.123(b)(1)(i) and (ii).

A PM2.5 Hot Spot Analysis checklist provided by ALDOT was used for the PM2.5 analysis for this project. This checklist revealed that this project is “Not a project of Air Quality Concern.” Since TIP Project STPBH-9802(916) was not found to be a project of air quality concern under 40 CFR 91.123(b)(1), a qualitative PM 2.5 hot-spot analysis is not required. The checklist is included in Attachment 3.

5 MSAT

Based on the example projects defined in the FHWA guidance “Updated Interim Guidance on Mobile Source Air Toxic Analysis in Nation Environmental Policy Act (NEPA) Documents” dated October 18, 2016, this project would be classified as a project with *no* meaningful MSAT impacts.

The purpose of this project is to provide an improved facility to accommodate existing and projected traffic along CR-52 East between I-65 and SR-3 (US-31) and along SR-3 (US-31) between CR-52 East and CR-52 West by improving intersection level-of-service at the US-31 intersections with CR 52 by providing synchronized system of street operations between the two intersections as well as improve three adjacent intersections which will enhance operations throughout the study area. This project has been determined to generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special mobile source air toxic (MSAT) concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause a meaningful increase in MSAT impacts of the project from that of the no-build alternative.

Moreover, (EPA) regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES2014 model forecasts a combined reduction of over 90 percent in the total annual emissions rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by over 45 percent (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016). This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project.

6 Conclusions

This project was evaluated for its consistency with state and federal air quality goals, including CO and PM_{2.5} as part of this assessment. Results indicated that the project is consistent with the STIP for the attainment of clean air quality in Alabama and is in compliance with federal air quality standards. The project is included in the 2020-2023 Transportation Improvement Program (TIP) for air quality conformity of the Birmingham Metropolitan Planning Organization (MPO).

ATTACHMENT 1

CATEGORICAL HOTSPOT ANALYSIS

ATTACHMENT 2

2016/2036 Traffic Diagrams

ATTACHMENT 3

PM2.5 Hot Spot Analysis checklist