INTER-OFFICE COMMUNICATION

Division of Air Pollution Control

TO: Noel Alcala, ODOT, Office of Environmental Services

FROM: Frederick Jones, OEPA, DAPC, ATU

DATE: February 29, 2016

RE: HEN-New Maumee River Bridge PID 22984 Qualitative MSAT Analysis Report for review.

Mobile Source Air Toxic (MSAT) Analysis Document Review

Document Reviewed:
HEN-New Maumee River Bridge PID 22984MSAT Analysis.

Comments:
Upon Review, Ohio EPA does not have additional comments on the MSAT Analysis Report: HEN-New Maumee River Bridge PID 22984Qualitative MSAT Analysis. According to the FHWA Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA (December 6, 2012), HEN-New Maumee River Bridge PID 22984 project qualifies as a project of "Low Potential for Meaningful MSAT Effects".

In accordance to CEQ regulations 40 CFR 1502.22(b) regarding unavailable or incomplete information for a Low MSAT effect project, as required, the report identifies the limitation in predicting project specific impacts through vehicle emissions and provides compliance information.

The MSAT analysis report states: The VMT estimated for the Build alternative is the same as that for the No Build alternative for all roadway sections except the new bridge; Even though the design year traffic volumes are the same for the No Build and Build alternatives, it is likely that the Build alternative will have slightly higher VMT because the additional capacity increases the efficiency of the roadway and will attract rerouted trips from elsewhere in the transportation network. The potential increase in VMT would lead to higher MSAT emissions for the Build alternative on East Riverview Avenue, Industrial Drive and SR 110 along with a corresponding decrease in MSAT emissions along parallel routes. Emissions increase would likely be reduced with the construction of the proposed roundabout at East Riverview Avenue and Industrial Drive with the elimination of idling vehicles waiting at stop signs. The emissions increase will also be offset somewhat by lower MSAT emission rates due to increased speeds on the other project roadways; Regardless of the alternative chosen, 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 MSAT emissions by over 80% from 2010 to 2050.

However, the magnitude of the EPA-projected reductions is so great that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

cc: Paul Koval Supervisor, DAPC/ATU
Mike Riggleman Manager, DAPC/mobile sources

Patrick Etchie - RE: Ohio EPA review of Qualitative MSAT Analysis for HEN-New Bridge (PID 22984)

From: "Noel.Alcala@dot.ohio.gov" <Noel.Alcala@dot.ohio.gov>
To: "frederick.jones@epa.ohio.gov" <frederick.jones@epa.ohio.gov>
Date: 2/29/2016 1:52 PM
Subject: RE: Ohio EPA review of Qualitative MSAT Analysis for HEN-New Bridge (PID 22984)
CC: "Michael.Stormer@dot.ohio.gov" <Michael.Stormer@dot.ohio.gov>, "Phoenix....

Thank you Frederick. This concludes the MSAT process.

If you have any questions or concerns, please do not hesitate to contact me by phone or email.

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by ODOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 11, 2015, and executed by FHWA and ODOT.

Noel Alcala, P.E.
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Noel.alcala@dot.ohio.gov
Please note: ODOT's Highway Traffic Noise Analysis Manual and associated noise links can be located at the following address:
http://www.dot.state.oh.us/Divisions/Planning/Environment/NEPA_policy_issues/NOISE/Pages/default.aspx

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From: Jones, Frederick
Sent: Monday, February 29, 2016 11:24 AM
To: Alcala, Noel <Noel.Alcala@dot.ohio.gov>
Cc: Stormer, Michael <Michael.Stormer@dot.ohio.gov>; Golnick, Phoenix <Phoenix.Golnick@dot.ohio.gov>; Schimmoeller, Stacy <Stacy.Schimmoeller@dot.ohio.gov>; Schneider, Erica <Erica.Schneider@dot.ohio.gov>; App, Douglas <Doug.App@dot.ohio.gov>; Koval, Paul <paul.koval@epa.ohio.gov>; Riggleman, Michael <Michael.Riggleman@epa.ohio.gov>
Subject: Ohio EPA review of Qualitative MSAT Analysis for HEN-New Bridge (PID 22984)

Attached is the OHIO EPA review for HEN-New Maumee River Bridge PID 22984. Contact me any question regarding the review.

Frederick Jones
Ohio Environmental Protection Agency
Division of Air Pollution Control
50 West Town Street, Suite 700
P.O. Box 1049
Columbus, OH 43216-1049
(614)644-3591
frederick.jones@epa.ohio.gov

Ohio Environmental Protection Agency

*NOTE: Ohio EPA's Asbestos updates and associated links can be located at the following web address:
http://www.epa.ohio.gov/dapc/atu/asbestos.aspx

From: Alcala, Noel
Sent: Wednesday, January 27, 2016 9:25 AM
To: Jones, Frederick
Cc: Stormer, Michael; Golnick, Phoenix; Schimmoeller, Stacy; Schneider, Erica; App, Douglas
Subject: RE: Qualitative MSAT Analysis for HEN-New Bridge (PID 22984)

Hello Frederick:
Attached for your review and approval is the subject document prepared by ODOT's consultant, Lawhon and Associates, in accordance with the FHWA Interim Guidance on Air Toxic Analysis in NEPA Documents (February 3, 2006), FHWA's September 30, 2009 MSAT Memorandum, and FHWA's December 6, 2012 MSAT Interim Guidance Update.

The HEN-New Maumee River Bridge (PID 22984) project is located in the City of Napoleon, Liberty Township and Harrison Township in Henry County, Ohio. The project location and study area is shown on
Figure 1. The proposed project is shown on Figure 2. The proposed project involves the extension of Industrial Drive, to the east, through East Riverview Road and over the Maumee River to State Route 110 (SR 110). The project would include the construction of a new bridge and new roadway from East Riverview Avenue to SR 110. The new bridge will extend an approximate distance of 1,000 feet connecting East Riverview Avenue (west side of bridge) with SR 110 (east side of bridge). The bridge and new connecting roadway will be two lanes in width. A new roundabout will be constructed at existing Industrial Drive/East Riverview Avenue intersection. A new roundabout will be constructed at new Industrial Drive/SR 110 intersection.

In accordance with the ODOT Technical Guidance for Analysis of Mobile Source Air Toxics, the subject project falls under the category of projects having low potential MSAT effects that are not expected to be associated with meaningful differences in emissions for project alternatives. Because the project involves moving travels lanes significantly closer to sensitive areas and the design year ADT is below 140,000, the project meets the criteria for "Low Potential MSAT Effects", in accordance with the FHWA Interim Guidance on Air Toxic Analysis in NEPA Documents (February 3, 2006) and a "Qualitative" MSAT Analysis was prepared. There have been no public involvement issues to date. There is no foreseen change in fleet mix between the existing and design years.

Your comments or concurrence would be appreciated by February 24, 2016 (4 weeks). As always, your cooperation and timely reviews have been greatly appreciated!!

If you have any questions or concerns, please do not hesitate to contact me by phone or email.

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by ODOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 11, 2015, and executed by FHWA and ODOT.

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Please note: ODOT's Highway Traffic Noise Analysis Manual and associated noise links can be located at the following address: http://www.dot.state.oh.us/Divisions/Planning/Environment/NEPA_policy_issues/NOISE/Pages/default.aspx

From: Schimmoeller, Stacy
Sent: Tuesday, January 26, 2016 2:05 PM
To: Alcala, Noel <Noel.Alcala@dot.ohio.gov>
Cc: Stormer, Michael <Michael.Stormer@dot.ohio.gov>; Golnick, Phoenix <Phoenix.Golnick@dot.ohio.gov>

Subject: FW: Upload of Qualitative MSAT Analysis for HEN-New Bridge (22984)

Hi Noel,

As you can see below, the MSAT for the subject project has been uploaded for review and coordination. Just let me know if there are questions or if more info is needed.

Thank you,
~Stacy

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by ODOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 11, 2015, and executed by FHWA and ODOT.

From: Patrick Etchie [mailto:PEtchie@manniksmithgroup.com]
Sent: Tuesday, January 26, 2016 1:22 PM
To: Schimmoeller, Stacy <Stacy.Schimmoeller@dot.ohio.gov>
Cc: Richard Bertz <RBertz@manniksmithgroup.com>
Subject: RE: Upload of Qualitative MSAT Analysis for HEN-New Bridge (22984)

Hi Stacy,

The Qualitative MSAT Analysis conducted by Lawhon Associates has been uploaded to the Henry New Bridge CE Online document and is ready for review.

Thanks,
Pat

Patrick L. Etchie, AICP
Sr. Project Manager / Grant Strategist
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January 22, 2016

QUALITATIVE ANALYSIS OF MOBILE SOURCE AIR TOXICS
HEN-NEW MAUMEE RIVER BRIDGE
PID 22984

Prepared for:

Ohio Department of Transportation
District 2
317 East Poe Road
Bowling Green, OH 43402

Prepared by:

Lawhon & Associates, Inc.
1441 King Avenue
Columbus, Ohio 43212
614-481-8600 (office)

Lawhon & Associates, Inc.

HEN-New Maumee River Bridge
PID 22984
Qualitative Analysis of Mobile Source Air Toxics

Introduction

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA assessed the expansive list of air toxics in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile. In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA).

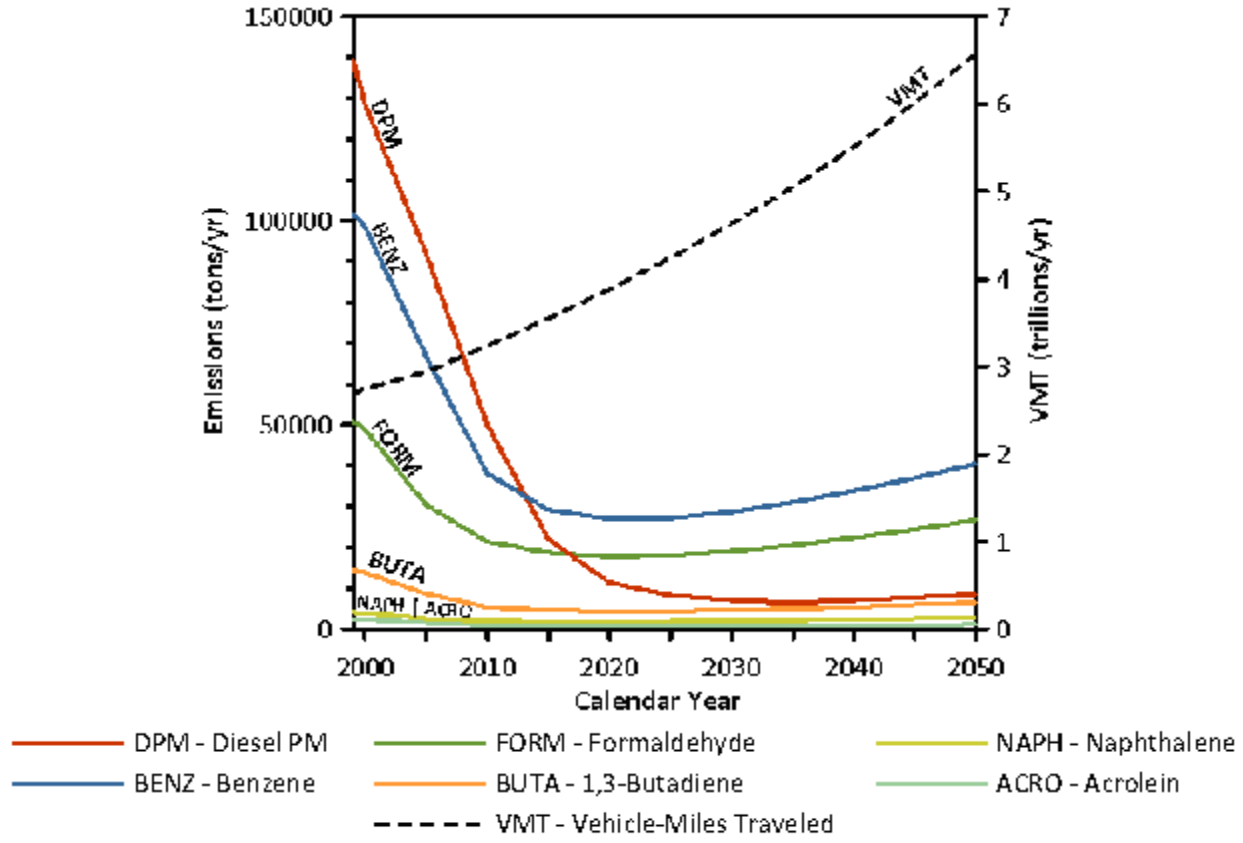
The 2007 EPA rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. The EPA rule also requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Between 1999 and 2050, even with FHWA projects that produce a 145 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 72 percent as shown in **Exhibit A**.

As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project.

EXHIBIT A

U.S. Annual Vehicle Miles Traveled (VMT) vs. Mobile Source Air Toxics Emissions, 1999-2050



Note:
(1) Annual emissions of polycyclic organic matter are projected to be 561 tons/yr for 1999, decreasing to 373 tons/yr for 2050.
(2) Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors
Source: U.S. Environmental Protection Agency. MOBILE6.2 Model run 20 August 2009.

Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions—if any—from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at:

http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm

Project Description

The HEN-New Maumee River Bridge (PID 22984) project is located in the City of Napoleon, Liberty Township and Harrison Township in Henry County, Ohio. The project location and study area is shown on Figure 1. The figures may be found at the end of this report. The proposed project is shown on Figure 2 and described as follows:

The new Maumee River Bridge/Industrial Drive - The proposed project involves the extension of Industrial Drive, to the east, through East Riverview Road and over the Maumee River to State Route 110 (SR 110). The project would include the construction of a new bridge and new roadway from East Riverview Avenue to SR 110. The new bridge will extend an approximate distance of 1,000 feet connecting East Riverview Avenue (west side of bridge) with SR 110 (east side of bridge). The bridge and new connecting roadway will be two lanes in width.

New roundabout at existing Industrial Drive/East Riverview Avenue intersection - A modern roundabout will be constructed just north of the Industrial Drive intersection with East Riverview Avenue. Industrial Drive will be reconstructed and widened a distance of approximately 300 feet south of the proposed roundabout. East Riverview Avenue will be reconstructed an approximate distance of 500 feet north of the proposed roundabout and approximately 450 feet south of the proposed roundabout.

New roundabout at new Industrial Drive/SR 110 intersection – A modern roundabout will be constructed along the west side of SR 110 where SR 110 intersects with the new Industrial Drive roadway to be constructed east of the proposed bridge. The new roadway will extend an approximate distance of 700 feet east of the Maumee River. SR 110 will be reconstructed a distance of approximately 650 feet north of the proposed roundabout and approximately 600 feet south of the proposed roundabout.

The proposed project will extend an approximate distance of 2,150 feet on Industrial Drive, 930 feet on East Riverview Avenue and approximately 1,300 feet on SR 110. Land use in the area of the proposed project consists mostly residential dwelling units on the west side of the river and undeveloped/agricultural land on the east side of the river.

HEN-New Maumee River Bridge Project

In accordance with the ODOT *Technical Guidance for Analysis of Mobile Source Air Toxics* (TG-POL-01-06 August 1, 2006) this project would fall under the category of projects having low potential MSAT emissions and is not expected to be associated with meaningful differences in emissions for the project alternatives. The project is an example of a project to improve the operation of roadways without adding substantial capacity and for which the ultimate traffic level is predicted to be less than 140,000 ADT. For each alternative evaluated for the HEN-New Maumee River Bridge project, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT) assuming that other variables such as fleet mix are the same for each alternative. For this project, only the design year 2035 Build and the design year 2035 No Build alternatives were considered in the evaluation. The ADT for this project was provided ODOT Office of Statewide Planning and Research in an IOC dated March 18, 2014. The VMT estimated for the Build alternative is the same as that for the No Build alternative for all roadway sections except the new bridge. See Table 1 for existing and design year VMTs for the sections of Industrial Drive, East Riverview Road and SR 110 under consideration.

Table 1. **Daily Vehicle Miles Traveled (VMT)**							
Roadway Section		Existing Year 2015	No Build Alternative 2035	Change – Existing to No Build	Build Alternative 2035	Change – Existing to Build Alternative	Change – Build to No Build
East Riverview Avenue	East Leg	132	143	+9%	143	+9%	0%
	West Leg	325	351	+7%	351	+7%	0%
Industrial Drive	North Leg	449	618	+38%	618	+38%	0%
	South Leg	n/a	n/a	- - -	810	- - -	- - -
SR 110	East Leg	361	392	+9%	392	+9%	
	West Leg	861	935	+8%	935	+8%	

Even though the design year traffic volumes are the same for the No Build and Build alternatives, it is likely that the Build alternative will have slightly higher VMT because the additional capacity increases the efficiency of the roadway and will attract rerouted trips from elsewhere in the transportation network. The potential increase in VMT would lead to higher MSAT emissions for the Build alternative on East Riverview Avenue, Industrial Drive and SR 110 along with a corresponding decrease in MSAT emissions along parallel routes. Emissions increase would likely be reduced with the construction of the proposed roundabout at East Riverview Avenue and Industrial Drive with the elimination of idling vehicles waiting at stop signs. The emissions increase will also be offset somewhat by lower MSAT emission rates due to increased speeds on the other project roadways; according to EPA's MOBILE6.2 model, emissions of all of the priority MSATS decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models. Because the estimated VMT under both alternatives will be the same, or nearly the same, it is expected there would be no appreciable difference in overall MSAT emissions under either alternative. Regardless of the alternative chosen, 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 MSAT emissions by over 80% from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth of up to 38% from the existing condition) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

As part of the Build alternative, the proposed new bridge and travel lanes on Industrial Avenue will be constructed over the river and on undeveloped land away from any potential sensitive receptor. The potential localized increases in MSAT concentrations would likely be most pronounced along SR 110 where traffic volumes are expected to increase between 8 -9% due to increased traffic using the proposed bridge.

However, as discussed above, the magnitude and the duration of these potential increases compared to the No-build alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a roadway is extended and, as a result, moves traffic into undeveloped areas, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but

this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs could be lower in other locations when traffic shifts away from other receptors. On a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than the existing year.

Unavailable Information for Project Specific MSAT Impact Analysis

This document includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable the prediction of project-specific health impacts of the emission changes associated with the alternatives in this project. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete. Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE6.2 is a trip-based model--emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

   These deficiencies compromise the capability of MOBILE6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations. However, MOBILE6.2 is currently the only available tool for use by FHWA/ODOT and may function adequately for larger scale projects for comparison of alternatives.

   2. Dispersion. The tools to predict how MSATs disperse are also limited. The

EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs: Research into the health impacts of MSATs is ongoing. For different emission types there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the

IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- **Acrolein:** The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust (DE)** is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary non-cancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years. Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community: While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have any "significant adverse impacts on the human environment."

In this document, a qualitative assessment has been provided relative to the various alternatives of MSAT emissions and has acknowledged that the project Build alternative compared to the No Build alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and

duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

Conclusion

In this document, FHWA has provided a qualitative analysis of MSAT emissions relative to the transportation improvement project. No appreciable difference in overall MSAT emissions is anticipated with the Project. The FHWA acknowledges that the proposed transportation improvement project may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

MSAT Mitigation Strategies

Lessening the effects of MSAT emissions should be considered for projects with substantial construction-related MSAT emissions that are likely to occur over an extended building period, and for post-construction scenarios where the NEPA analysis indicates potentially meaningful MSAT levels. Such mitigation efforts should be evaluated based on the circumstances associated with individual projects, and they may not be appropriate in all cases. However, there are a number of available mitigation strategies and solutions for countering the effects of MSAT emissions. **This is not a project with substantial construction-related MSAT emissions that are likely to occur over an extended building period or a post-construction scenario where the NEPA analysis indicates potentially meaningful MSAT levels.**

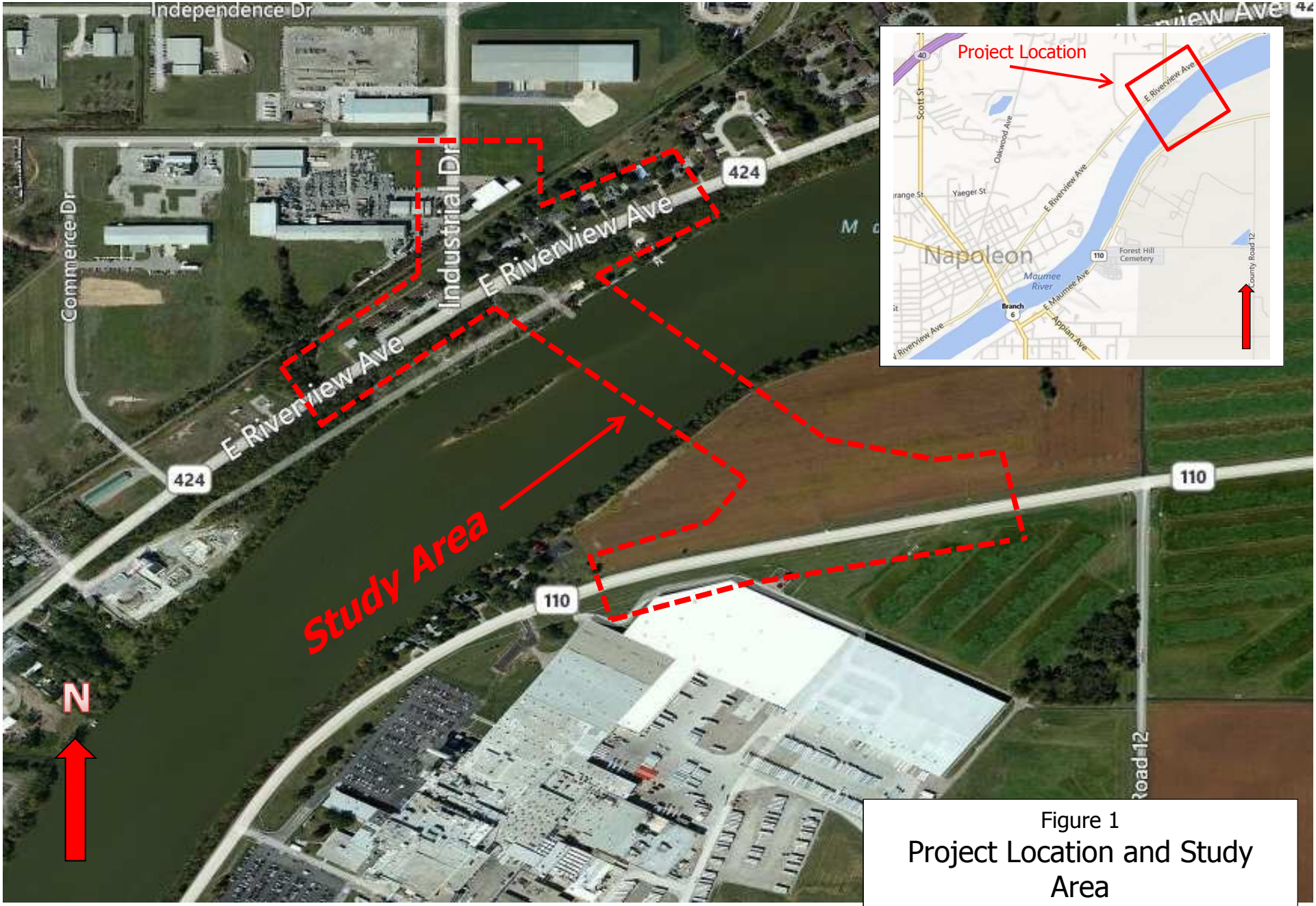


Figure 1

Project Location and Study Area

HEN- New Maumee River Bridge (22984)

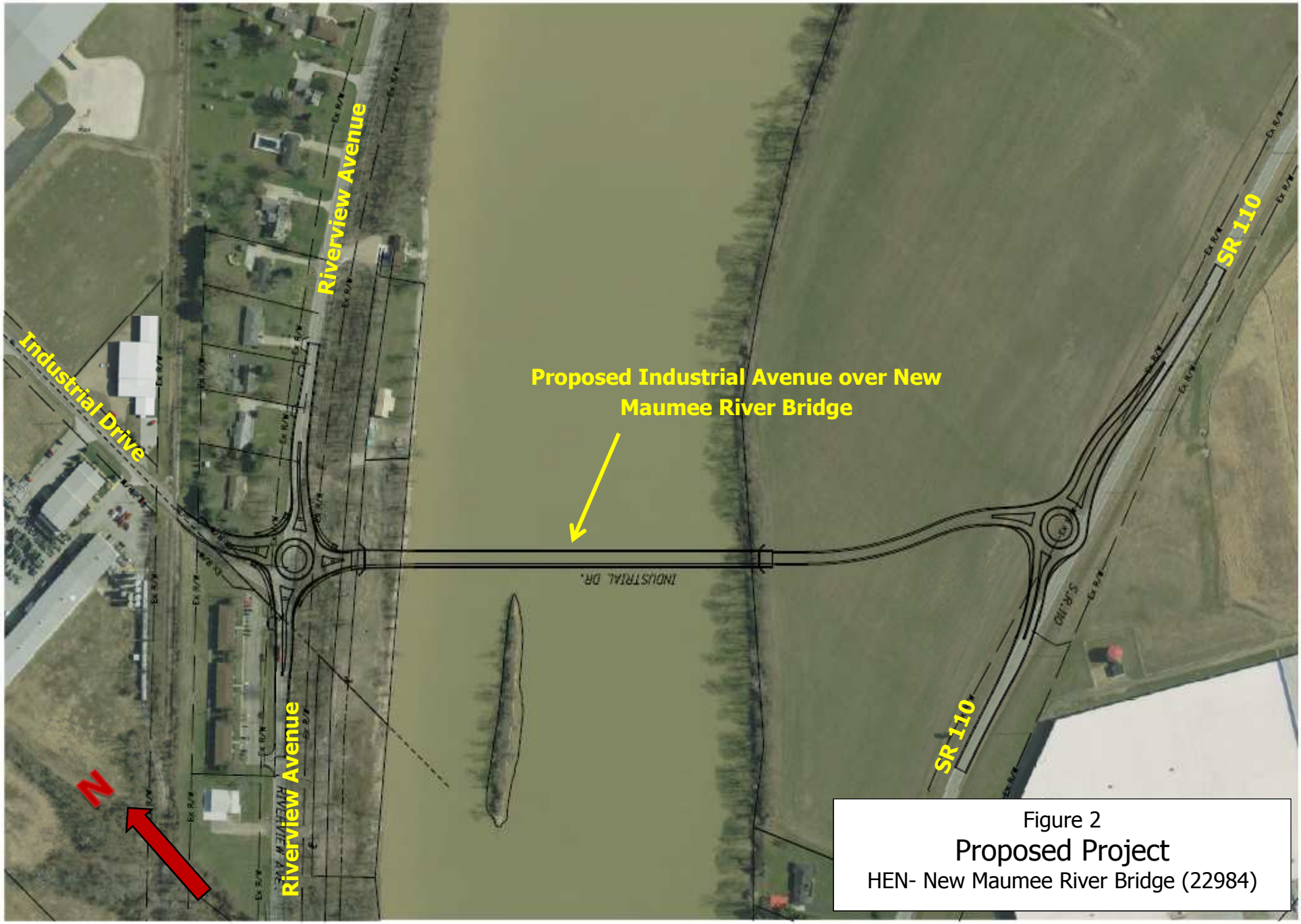


Figure 2
Proposed Project
HEN- New Maumee River Bridge (22984)