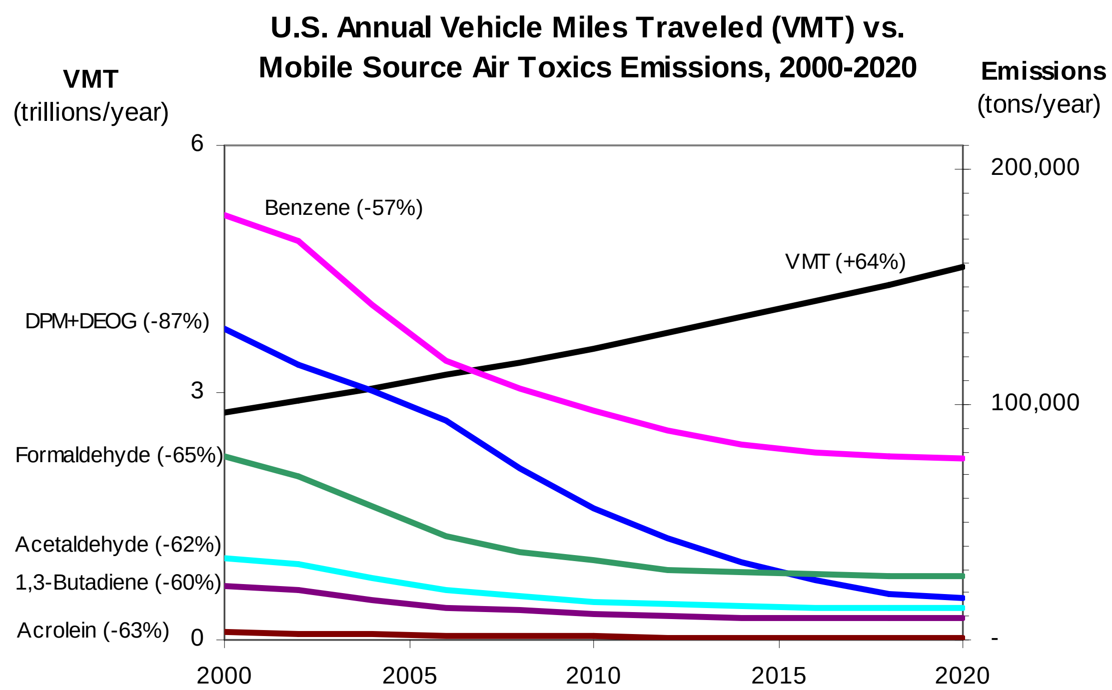
Background

In February, 2006, FHWA issued guidance for the analysis of mobile source air toxics (MSATs) in the NEPA process for highway projects (FHWA *Interim Guidance on Air Toxic Analysis in NEPA Documents* February 3, 2006). The following language is taken verbatim from this guidance document.

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), U.S. 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).

MSATs are a subset of the 188 air toxics defined by the Clean Air Act. 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.

U.S. EPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. U.S. EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, U.S. 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. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent, as shown in the following graph:



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM +DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

As a result, U.S. 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.

Unavailable Information for Project Specific MSAT Impact Analysis

This EIS includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this EIS. 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.

Emissions. U.S. 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 MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 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 MOBILE 6.2 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, MOBILE 6.2 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 MOBILE 6.2 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, U.S. EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE 6.2 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.

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

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 U.S. 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.

U.S. EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. U.S. EPA’s 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.U.S. 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 U.S. 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.
- 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 noncancer 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 U.S. 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 problems1. 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 on Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. 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 "significant adverse impacts on the human environment."

In this document, a quantitative assessment of MSAT emissions relative to the various alternatives has been performed, as described below.

Analysis of Impacts for Proposed Project

The FHWA guidance suggests a three-tiered approach to analyzing the effects of a transportation project in terms of public exposure to MSAT emissions. The level of analysis is related to expected size and impact of the project, as follows:

1. No analysis for projects with no potential for meaningful MSAT effects.
2. Qualitative analysis for projects with low potential MSAT effects.

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

The proposed project meets the criteria of category 3, and therefore a qualitative assessment of MSATs is provided in this document.

The quantitative MSAT analysis for the proposed project was performed using SEWRPC's traffic network for the study corridor. The network also includes state and county highways that intersect or cross the study-area freeway system, along with parallel roads as far west as USH 45 in Kenosha and Racine Counties, 76th Street in Milwaukee County and as far east as STH 31 in Kenosha and Racine Counties and Howell Avenue in Milwaukee County. MOBILE6.2 input parameters for existing year 2005, opening year 2015 and design year, 2035 were provided by the DNR. The data in SEWRPC's network; roadway length, number of lanes, free flow speed and hourly lane volume, along with WisDOT data on area type and highway type were placed into one data base. This database and the DNR's MOBILE6.2 input files were accessed by FHWA's Easy Mobile Inventory Tool (EMIT) to create the quantitative MSAT analysis. EMIT was created by the FHWA to complete a locale-specific mobile source emission inventory by incorporating a component for forecasting congested vehicle speeds and entering vehicle-miles of travel and a component for employing the MOBILE6.2 model (FHWA, 2006).

MSAT ANALYSIS

Acetaldehyde

Kenosha County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	938.9	684.8	1,623.7	1,164.0	913.7	2,077.7	1,516.8	1,272.2	2,789.0	1,181.1	896.6	2,077.7	1,558.3	1,230.7	2,789.0
Emissions (tpy)	1.44	1.08	2.51	0.84	0.66	1.50	0.94	0.80	1.74	0.85	0.64	1.49	0.91	0.77	1.69

Racine County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	968.4	539.3	1,507.7	1,125.3	698.2	1,823.5	1,371.0	947.2	2,318.2	1,148.0	672.3	1,820.3	1,426.3	884.3	2,310.6
Emissions (tpy)	1.49	0.88	2.37	0.81	0.51	1.32	0.81	0.58	1.39	0.82	0.49	1.31	0.83	0.53	1.35

Milwaukee County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	1,395.0	1,381.3	2,776.3	1,519.3	1,609.0	3,128.3	1,714.1	1,965.8	3,679.9	1,590.1	1,570.2	3,160.3	1,886.0	1,871.5	3,757.5
Emissions (tpy)	2.34	2.64	4.98	1.17	1.34	2.51	1.10	1.35	2.45	1.20	1.30	2.49	1.18	1.25	2.43

I-94 Study Area Total

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	3,302.3	2,605.4	5,907.7	3,808.6	3,220.9	7,029.5	4,601.9	4,185.2	8,787.1	3,919.3	3,139.1	7,058.3	4,870.6	3,986.5	8,857.1
Emissions (tpy)	5.26	4.60	9.86	2.83	2.50	5.33	2.85	2.73	5.58	2.86	2.43	5.29	2.91	2.55	5.46

TPY = tons per year

MSAT ANALYSIS - Continued

Acrolein

Kenosha County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	938.9	684.8	1,623.7	1,164.0	913.7	2,077.7	1,516.8	1,272.2	2,789.0	1,181.1	896.6	2,077.7	1,558.3	1,230.7	2,789.0
Emissions (tpy)	0.11	0.07	0.18	0.06	0.04	0.10	0.07	0.05	0.12	0.06	0.04	0.10	0.07	0.05	0.12

Racine County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	968.4	539.3	1,507.7	1,125.3	698.2	1,823.5	1,371.0	947.2	2,318.2	1,148.0	672.3	1,820.3	1,426.3	884.3	2,310.6
Emissions (tpy)	0.11	0.06	0.17	0.06	0.03	0.09	0.06	0.04	0.10	0.06	0.03	0.09	0.06	0.03	0.09

Milwaukee County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	1,395.0	1,381.3	2,776.3	1,519.3	1,609.0	3,128.3	1,714.1	1,965.8	3,679.9	1,590.1	1,570.2	3,160.3	1,886.0	1,871.5	3,757.5
Emissions (tpy)	0.18	0.19	0.37	0.09	0.09	0.17	0.08	0.09	0.17	0.09	0.08	0.17	0.09	0.06	0.17

I-94 Study Area Total

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	3,302.3	2,605.4	5,907.7	3,808.6	3,220.9	7,029.5	4,601.9	4,185.2	8,787.1	3,919.3	3,139.1	7,058.3	4,870.6	3,986.5	8,857.1
Emissions (tpy)	0.41	0.33	0.73	0.21	0.16	0.37	0.21	0.17	0.39	0.21	0.15	0.37	0.22	0.13	0.38

TPY = tons per year

MSAT ANALYSIS - Continued

Benzene

Kenosha County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	938.9	684.8	1,623.7	1,164.0	913.7	2,077.7	1,516.8	1,272.2	2,789.0	1,181.1	896.6	2,077.7	1,558.3	1,230.7	2,789.0
Emissions (tpy)	3.52	3.09	6.61	1.93	1.74	3.67	2.02	2.04	4.07	1.93	1.71	3.64	2.01	1.97	3.98

Racine County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	968.4	539.3	1,507.7	1,125.3	698.2	1,823.5	1,371.0	947.2	2,318.2	1,148.0	672.3	1,820.3	1,426.3	884.3	2,310.6
Emissions (tpy)	3.65	2.52	6.17	1.86	1.36	3.22	1.78	1.48	3.26	1.88	1.29	3.17	1.82	1.35	3.17

Milwaukee County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	1,395.0	1,381.3	2,776.3	1,519.3	1,609.0	3,128.3	1,714.1	1,965.8	3,679.9	1,590.1	1,570.2	3,160.3	1,886.0	1,871.5	3,757.5
Emissions (tpy)	5.72	7.50	13.22	2.63	3.52	6.15	2.35	3.41	5.75	2.70	3.41	6.12	2.54	3.17	5.71

I-94 Study Area Total

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	3,302.3	2,605.4	5,907.7	3,808.6	3,220.9	7,029.5	4,601.9	4,185.2	8,787.1	3,919.3	3,139.1	7,058.3	4,870.6	3,986.5	8,857.1
Emissions (tpy)	12.90	13.11	26.01	6.41	6.62	13.04	6.16	6.93	13.08	6.51	6.42	12.93	6.37	6.48	12.85

TPY = tons per year

MSAT ANALYSIS - Continued

1,3-Butadiene

Kenosha County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	938.9	684.8	1,623.7	1,164.0	913.7	2,077.7	1,516.8	1,272.2	2,789.0	1,181.1	896.6	2,077.7	1,558.3	1,230.7	2,789.0
Emissions (tpy)	0.53	0.44	0.98	0.29	0.26	0.55	0.32	0.32	0.63	0.29	0.25	0.55	0.31	0.31	0.62

Racine County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	968.4	539.3	1,507.7	1,125.3	698.2	1,823.5	1,371.0	947.2	2,318.2	1,148.0	672.3	1,820.3	1,426.3	884.3	2,310.6
Emissions (tpy)	0.55	0.36	0.92	0.28	0.20	0.48	0.28	0.23	0.51	0.29	0.19	0.48	0.28	0.21	0.49

Milwaukee County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	1,395.0	1,381.3	2,776.3	1,519.3	1,609.0	3,128.3	1,714.1	1,965.8	3,679.9	1,590.1	1,570.2	3,160.3	1,886.0	1,871.5	3,757.5
Emissions (tpy)	0.86	1.08	1.94	0.40	0.52	0.92	0.37	0.53	0.90	0.41	0.50	0.91	0.40	0.49	0.89

I-94 Study Area Total

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	3,302.3	2,605.4	5,907.7	3,808.6	3,220.9	7,029.5	4,601.9	4,185.2	8,787.1	3,919.3	3,139.1	7,058.3	4,870.6	3,986.5	8,857.1
Emissions (tpy)	1.95	1.88	3.83	0.97	0.98	1.95	0.97	1.08	2.04	0.99	0.95	1.93	1.00	1.01	2.00

TPY = tons per year

MSAT ANALYSIS - Continued

Diesel Particulate Matter & Diesel Exhaust Organic Gases

Kenosha County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	938.9	684.8	1,623.7	1,164.0	913.7	2,077.7	1,516.8	1,272.2	2,789.0	1,181.1	896.6	2,077.7	1,558.3	1,230.7	2,789.0
Emissions (tpy)	11.51	3.12	14.63	2.59	0.83	3.42	0.71	0.23	0.94	2.62	0.82	3.44	0.73	0.22	0.95

Racine County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	968.4	539.3	1,507.7	1,125.3	698.2	1,823.5	1,371.0	947.2	2,318.2	1,148.0	672.3	1,820.3	1,426.3	884.3	2,310.6
Emissions (tpy)	11.87	2.46	14.33	2.50	0.64	3.14	0.64	0.17	0.81	2.55	0.61	3.16	0.67	0.16	0.83

Milwaukee County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	1,395.0	1,381.3	2,776.3	1,519.3	1,609.0	3,128.3	1,714.1	1,965.8	3,679.9	1,590.1	1,570.2	3,160.3	1,886.0	1,871.5	3,757.5
Emissions (tpy)	17.10	6.29	23.39	3.38	1.47	4.84	0.80	0.35	1.15	3.53	1.43	4.97	0.88	0.33	1.21

I-94 Study Area Total

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	3,302.3	2,605.4	5,907.7	3,808.6	3,220.9	7,029.5	4,601.9	4,185.2	8,787.1	3,919.3	3,139.1	7,058.3	4,870.6	3,986.5	8,857.1
Emissions (tpy)	40.48	11.87	52.35	8.46	2.94	11.40	2.16	0.75	2.90	8.71	2.86	11.57	2.28	0.71	2.99

TPY = tons per year

MSAT ANALYSIS - Continued

Formaldehyde

Kenosha County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	938.9	684.8	1,623.7	1,164.0	913.7	2,077.7	1,516.8	1,272.2	2,789.0	1,181.1	896.6	2,077.7	1,558.3	1,230.7	2,789.0
Emissions (tpy)	2.31	1.52	3.84	1.37	0.93	2.29	1.55	1.15	2.69	1.36	0.91	2.27	1.48	1.10	2.58

Racine County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	968.4	539.3	1,507.7	1,125.3	698.2	1,823.5	1,371.0	947.2	2,318.2	1,148.0	672.3	1,820.3	1,426.3	884.3	2,310.6
Emissions (tpy)	2.40	1.25	3.65	1.32	0.72	2.04	1.33	0.82	2.15	1.33	0.69	2.01	1.33	0.75	2.08

Milwaukee County

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	1,395.0	1,381.3	2,776.3	1,519.3	1,609.0	3,128.3	1,714.1	1,965.8	3,679.9	1,590.1	1,570.2	3,160.3	1,886.0	1,871.5	3,757.5
Emissions (tpy)	3.81	3.80	7.61	1.94	1.92	3.86	1.84	1.94	3.78	1.96	1.86	3.82	1.95	1.81	3.76

I-94 Study Area Total

	2004			2015 6-Lane			2035 6-Lane			2015 8 -Lane			2035 8-Lane		
	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total	Freeway	Arterial	Total
Daily VMT (000)	3,302.3	2,605.4	5,907.7	3,808.6	3,220.9	7,029.5	4,601.9	4,185.2	8,787.1	3,919.3	3,139.1	7,058.3	4,870.6	3,986.5	8,857.1
Emissions (tpy)	8.51	6.58	15.09	4.62	3.57	8.19	4.72	3.91	8.62	4.65	3.46	8.11	4.76	3.66	8.42

Source: MTP May 2007.
TPY = tons per year