



## Air Quality Technical Memorandum

NICTD Double Track NWI (DT-NWI)  
Milepost (MP) 58.8 to MP 32.2

*Gary to Michigan City, IN*

August 18, 2017



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# NICTD Double Track – Air Quality Technical Memorandum

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## Acronyms

Acronym	Definition
CAA	Clean Air Act of 1990
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CP	control point
diesel PM	diesel particulate matter
EA	Environmental Assessment
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	greenhouse gases
IDEM	Indiana Department of Environmental Quality
MP	milepost
MSAT	mobile source air toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NICTD	Northern Indiana Commuter Transportation District
NO <sub>2</sub>	nitrogen dioxide
O <sub>3</sub>	ozone
Pb	lead
PM <sub>2.5</sub>	particulate matter with diameters of 2.5 microns or less
PM <sub>10</sub>	particulate matter with diameters of 10 microns or less
ppb	parts per billion
ppm	parts per million
RTP	Regional Transportation Plan
SSL	South Shore Line
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
TIP	Transportation Improvement Program
µg/m <sup>3</sup>	micrograms per cubic meter
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled



## 1.0 INTRODUCTION

The Northern Indiana Commuter Transportation District (NICTD), in cooperation with the Federal Transit Administration (FTA), proposes improvements and expansion of a 26.6-mile segment of the South Shore Line (SSL) between Gary and Michigan City. SSL is an important component of Northwest Indiana's transportation system, and double tracking would provide a more competitive transportation option between Northwest Indiana and Chicago. The proposed improvements would better connect the region by providing faster, more frequent, and more reliable train service.

The proposed Project limits are defined by mileposts (MPs), which correspond with signal control points for the SSL/Chicago South Shore and South Bend Railroad (CSS) railroad tracks. The proposed Project begins in Gary at MP 58.8, west of Virginia Street, and ends at MP 32.2, near Carroll Avenue in Michigan City. The total distance is 26.6 miles. Nearly 6.5 miles of double-track mainline already exists within the proposed Project limits, generally between the east end of Gary (MP 54.0) and Burns Harbor (MP 47.5). There are also three separate passing sidings totaling 2.2 miles. Therefore, the total distance of existing double track is 8.7 miles.

Within the 26.6-mile Project Area, the proposed Project would include 1.8 miles of signal work at the far west and east ends of the project, generally between MP 58.8 and 58.1 and MP 33.3 and 32.2, and the construction of 16.1 miles of new second mainline track and new overhead contact system (OCS or catenary) between MP 58.1 in Gary and MP 33.3 in Michigan City. These MPs roughly correspond with Tennessee Street in Gary and Michigan Boulevard in Michigan City.

This technical memorandum evaluates the short- and long-term impacts of the proposed Project on air quality. The Northwestern Indiana Regional Planning Commission (NIRPC), which is the Metropolitan Planning Organization (MPO) for the region, adopted the 2040 *Comprehensive Regional Plan* (CRP) in June 2011. In May 2017, the proposed Project was added to the 2040 Comprehensive Regional Plan and the list of fiscally constrained capacity expansion projects (referred to as the Transportation Improvement Program or TIP), all of which were recently evaluated for conformity with the State Implementation Plan (SIP) (NIRPC 2017b). In addition, since the proposed Project would result in a modest reduction in vehicle miles traveled (VMT), and incorporates by reference recent guidance documents issued by the Federal Highway Administration (FHWA), FTA, and the Council on Environmental Quality (CEQ), a qualitative analysis was completed to assess potential impacts from the proposed Project on air quality.

## 1.1 LEGAL/REGULATORY CONTEXT AND METHODOLOGY

The Clean Air Act of 1990 (CAA) and its associated regulations are the basic federal statutes and regulations governing air pollution. The provisions that are potentially relevant to this Project are the National Ambient Air Quality Standards (NAAQS), the Transportation Conformity rule, and mobile source air toxics (MSATs). Each of these provisions is discussed below.

### 1.1.1 NAAQS

The CAA requires the U.S. Environmental Protection Agency (USEPA) to establish NAAQS for pollutants considered harmful to public health and the environment. Primary standards set limits to protect public health, including the health of "sensitive" populations, such as people with asthma, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

USEPA has established NAAQS for six principal pollutants, which are called "criteria" pollutants. These pollutants are carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), lead (Pb), particulate matter with diameters of 10 microns or less (respirable particulate matter) (PM<sub>10</sub>), particulate matter with



diameters of 2.5 microns or less (fine particulate matter) (PM<sub>2.5</sub>), and sulfur dioxide (SO<sub>2</sub>). The NAAQS are summarized in **Table 1-1**.

**Table 1-1. NAAQS**

Pollutant	Averaging Period	NAAQS	
		Primary	Secondary
CO	8-hour <sup>1</sup>	9 ppm (10,000 µg/m <sup>2</sup> )	None
	1-hour <sup>1</sup>	35 ppm (40,000 µg/m <sup>2</sup> )	None
NO <sub>2</sub>	1-hour	100 ppb (188 µg/m <sup>2</sup> )	Same as primary
	Annual	53 ppb (100 µg/m <sup>2</sup> )	Same as primary
O <sub>3</sub> (2015 Standard)	8-hour <sup>2</sup>	0.070 ppm	Same as primary
PM <sub>10</sub>	24-hour <sup>1</sup>	150 µg/m <sup>2</sup>	Same as primary
PM <sub>2.5</sub>	24-hour	35 µg/m <sup>2</sup>	Same as primary
	Annual	12 µg/m <sup>2</sup>	15 µg/m <sup>2</sup>
SO <sub>2</sub>	1-hour	75 ppb (196 µg/m <sup>3</sup> )	None
	3-hour <sup>1</sup>	None	0.5 ppm (1,300 µg/m <sup>2</sup> )
Lead	Rolling 3 month avg.	0.15 µg/m <sup>2</sup>	Same as primary

ppb = parts per billion, ppm = parts per million, µg/m<sup>3</sup> = micrograms per cubic meter

<sup>1</sup> Must not be exceeded more than once per year.

<sup>2</sup> To attain this standard, the 3-year average of the fourth highest daily maximum 8-hour average O<sub>3</sub> concentrations measured at each monitor within an area over each year must not exceed 0.070 ppm). The final rule was signed on October 1, 2015, and became effective December 28, 2015. The previous (2008) O<sub>3</sub> standard of 0.075 ppm additionally remains in effect until the new standard is fully implemented in the area.

### 1.1.2 TRANSPORTATION CONFORMITY RULE

The Transportation Conformity Rule (40 Code of Federal Regulations Part 93, Subpart A) requires that projects that are developed, funded, or approved by the U.S. Department of Transportation (USDOT) and by metropolitan planning organizations or other recipients of federal funds demonstrate conformity with the SIP developed pursuant to the CAA. A determination of conformity is made by the metropolitan planning organization and USDOT.

The Transportation Conformity regulations require that transportation projects that are regionally important and/or federally funded demonstrate conformity to state implementation and maintenance plans. These regulations require that the project:

- be included in a fiscally constrained Regional Transportation Plan (RTP)
- be included in a fiscally constrained TIP
- not cause or contribute to any new or existing violations of NAAQS

The proposed Project was recently added to the 2040 Comprehensive Regional Plan and the list of financially constrained capacity expansion projects (referred to as the TIP), both of which were recently evaluated for conformity with the SIP (NIRPC 2017b). The Air Quality Conformity Determination issued in May 2017 is provided in **Appendix A**.

### 1.1.3 MSATS

In addition to the NAAQS, the CAA requires USEPA to regulate air toxics. MSATs are a subset of air toxics, which include nine compounds emitted from highway vehicles, trucks, buses, and nonroad equipment. These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. Of these, diesel PM remains the dominant MSAT of concern for highway and other transportation projects.

USEPA regulations and standards for vehicle engines and fuels will cause overall MSAT emissions to decline substantially over the next several decades. Based on current and future motor vehicle standards, an analysis of national trends with USEPA's MOVES2014a model<sup>1</sup> forecasts a combined reduction of 91 percent in the total annual emissions of priority MSATs from 2010 to 2050 (FHWA 2016).

The proposed Project would result in an increase in transit ridership with a commensurate reduction in vehicular traffic. In accordance with FHWA guidance, this Project is classified as one with "No Meaningful Potential MSAT Effects" because it would have beneficial traffic impacts, and the guidance recommends that no MSAT analysis be conducted for these types of projects.

### 1.1.4 GREENHOUSE GAS EMISSIONS

The role of carbon dioxide (CO<sub>2</sub>) and other human-made greenhouse gases (GHGs) in climate change have been the subject of both debate and increasing regulation in recent years. In the United States, the regulatory framework for CO<sub>2</sub> began in earnest on April 1, 2007, when the U.S. Supreme Court ruled that USEPA had authority to regulate CO<sub>2</sub> emissions from automobiles. Since that time, USEPA has developed additional rules regarding the reporting and permitting of GHG emissions; however, the current rules do not require any controls or establish any standards related to GHG emissions for transportation projects.

National Environmental Policy Act (NEPA) analyses of GHG emissions and climate change pose difficult challenges in ensuring that meaningful analyses are provided. Virtually any human activity, including those that federal agencies fund or permit, can cause emissions of GHGs, yet it is unlikely that any individual project would generate enough GHG emissions to significantly influence global climate change. Instead, a project contributes to the global climate impact incrementally and cumulatively, combining with the emissions from all other sources of GHGs.

The FTA considers it practicable to assess the effects of GHG emissions and climate change for transit projects at a programmatic level and has prepared a programmatic assessment to estimate direct and indirect GHG emissions generated from the construction, operations, and maintenance phases of various transit projects across selected transit modes (FTA 2017). The results of that programmatic assessment have been incorporated into this analysis by reference.

## 2.0 EXISTING CONDITIONS

The Region of Influence for air quality includes Lake, Porter, and LaPorte Counties. For air quality planning purposes, Lake and Porter Counties are typically grouped with Cook County and other Chicago - area counties and are included in the Chicago-Naperville ozone nonattainment area.

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<sup>1</sup> USEPA's Motor Vehicle Emission Simulator (MOVES) is an emission modeling system that estimates emissions for mobile sources for criteria air pollutants, greenhouse gases, and air toxics.



### 2.1.1 REGIONAL ATTAINMENT STATUS

Lake and Porter Counties are designated as “moderate nonattainment” with regard to the 2008 8-hour ozone standard. In addition, portions of Lake County are designated “maintenance” for CO and PM<sub>10</sub>. LaPorte County is designated “attainment” for all of the NAAQS.

## 3.0 ENVIRONMENTAL IMPACTS

Air quality impacts for both the No Build and the Build Alternatives have been assessed qualitatively. Potential air quality impacts may result from ongoing maintenance activities, short-term impacts during construction (Build Alternative only), and long-term impacts associated with traffic and system operation.

### 3.1 NO BUILD ALTERNATIVE

As described in **Chapter 2** of the Environmental Assessment (EA), service quality and effective capacity of the SSL would decline over time under the No Build Alternative. Interference with freight train operations would continue and worsen because of the anticipated growth in freight traffic. The lack of upgrades to the commuter rail facility would discourage new ridership and result in an increased number of motor vehicle trips, which would contribute to worsening traffic congestion and long-term regional air quality impacts. The No Build Alternative would have a detrimental effect on regional air quality.

Under the No Build Alternative, no major construction activities would be associated with double tracking or station investments. Maintenance and repair activities would continue under the No Build Alternative, and these activities would result in minor localized short-term air quality impacts in the immediate vicinity of the maintenance activities.

### 3.2 BUILD ALTERNATIVE

#### PERMANENT IMPACTS

Project implementation would mean that criteria pollutant and GHG emissions would be reduced (versus the No Build Alternative) from motor vehicles within the Project Area. However, slightly increased emissions could result to the extent that fossil-fueled power plants are used to produce electricity to power the trains via overhead electric wires.

Criteria pollutant emissions from motor vehicles vary based on the average speeds of vehicles and VMT. GHG emissions from motor vehicles are proportional to the VMT. The VMT estimated for the Build Alternative is slightly lower than that for the No Build Alternative because the Build Alternative would result in additional trains and higher ridership, which would reduce motor vehicle commute trips. This lower VMT would result in reduced emissions of both criteria pollutants and GHG. The proposed Project would not have a significant effect on motor vehicle speeds in the Project Area.

The Build Alternative would include new parking at several stations. Parking lots can result in slightly elevated pollutant concentrations, particularly during the morning and evening commute periods when a number of vehicles attempt to enter or leave a parking lot simultaneously. However, given the substantial improvements in motor vehicle emission standards, these slightly elevated pollutant concentrations would not result in pollutant “hot spots” and would not result in exceedances of the NAAQS at any location within the Project Area.

The closure of some minor residential streets within Michigan City could divert additional motor vehicle trips to other roadways that remain open. While this could result in some additional congestion on the arterial roadways, this impact would be minor and would have minimal air quality effects.

The Build Alternative would result in a slight increase in electricity consumption because of the increase in the number of trains operating in the Project Area, which would result in a slight increase in criteria and GHG emissions from the regional power plants. This increase in criteria pollutants from regional power plants would have an insignificant impact on regional air quality.

FTA's programmatic assessment (FTA 2017) assessed the impact of electrified light rail and commuter rail projects on overall emissions of GHG, taking into account increased emissions from power plants and decreased emissions from motor vehicles. The majority of GHG emissions that electrified light rail projects are expected to generate are operations-related emissions associated with the production and generation of the purchased electricity used to power the light rail vehicles. For this reason, the net volume of annual GHG emissions from light rail projects largely depends on the fuel source used for electricity generation. Each of the light rail projects analyzed was expected to displace emissions through a reduction in personal vehicle VMT. In 80 percent of the projects (8 of 10), the light rail project displaced more emissions than it generated on an annual basis (FTA 2017).

The SSL is an electric-powered commuter line. The commuter rail projects evaluated in the FTA programmatic assessment consisted solely of diesel-powered commuter rail service, and thus may not be directly comparable to the proposed Project. However, based on the expected reduction in personal vehicle VMT compared with the No Build Alternative, and the fact that the SSL is, and would continue to be, electrified, the Build Alternative would result in a slight reduction of criteria pollutant and GHG emissions compared with the No Build Alternative. This conclusion is consistent with the analysis presented in FTA 2017, the details of which are incorporated by reference into the EA.

## **CONSTRUCTION IMPACTS**

The primary emission sources during construction would be standard types of heavy-duty diesel construction equipment (bulldozers, loaders, cranes, etc.) and highway trucks that would deliver construction materials to the site. Construction and earthmoving activities would result in localized increases in pollutant concentrations that would persist for the duration of the construction activities. For example, pollutant concentrations would increase during the day when equipment is operating, and these concentrations would decrease at night when construction activities would cease. In addition, because construction activities would be spread out along the Project Area, the duration of construction at any one location within the Project Area would be relatively short (i.e., several weeks). This would tend to limit localized air quality impacts at any given location. The short-term increases in pollutant concentrations are not expected to exceed any NAAQS, and the construction-related air quality impacts are considered minor to moderate.

To reduce adverse air quality impacts during construction, NICTD would direct the contractor to prepare and implement a Dust Control Plan, a work-zone traffic management plan, and a strategy to control emissions from diesel-powered equipment. Additionally, the contractor would be required to follow the USEPA's Construction Emission Control Checklist. Given that construction activities would occur within some residential neighborhoods—for example, in Michigan City—mitigation measures including the following would be employed to reduce the impacts on nearby residences and businesses:

- limit idling of construction equipment during periods of inactivity
- maintain construction equipment in proper working condition
- use water or other dust suppressants to ensure that fugitive dust does not leave the construction site
- limit the speed of construction vehicles on unpaved areas



- promptly clean up spills and dirt tracked onto paved roadways

In addition to these recommended mitigation measures, the construction contractor would employ at least one environmental staff member responsible for monitoring construction activities within residential areas to ensure that construction does not become a nuisance to nearby residences.

#### 4.0 REFERENCES

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updated and amended, The Fiscal Year 2018 to 2021 Transportation Improvement Program as  
adopted, and the Indiana State Implementation Plan for Air Quality. Published March 21, 2017.

# **APPENDIX A**

Air Quality Conformity Determination



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U.S. Department  
of Transportation  
**Federal Highway  
Administration**

**Indiana Division**

July 3, 2017

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Federal Transit Administration  
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In Reply Refer To:  
HDA-IN

Roy Nunnally, Director  
Asset Management Division  
Indiana Department of Transportation  
100 N Senate Ave. N925  
Indianapolis, IN 46204

Dear Mr. Nunnally:

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have completed our review of the documents necessary to make an air quality conformity finding on the Northwestern Indiana Regional Planning Commission (NIRPC) amendment to the 2040 Comprehensive Regional Plan (CRP) and the FY 2018-2021 Transportation Improvement Program (TIP).

The Indiana Department of Environmental Management, the Indiana Department of Transportation, and the US Environmental Protection Agency have completed their reviews and recommend that we find the amendment to 2040 CRP and TIP conform to the applicable air quality conformity requirements. Appropriate consultation and public involvement on the conformity analyses was completed.

Therefore, FHWA and FTA find the NIRPC's amendment to the 2040 CRP and FY 2018-2021 TIP conform as required by the conformity rule. If you have any questions, please feel free to call Joyce Newland of FHWA at (317) 226-5353 or Susan Weber of FTA at (312) 353-3888.

Sincerely,

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FHWA Indiana Division

Marisol Simón  
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