- Rehabilitation, restoration, and adaptive reuse of buildings and structures;
- Demolition and removal of properties that do not contribute to the cultural significance of an area;
- Redesign of projects to preserve specific characteristics of cultural resources;
- Relocation of buildings and structures;
- Creation and implementation of maintenance and management plans;
- Transfer of historic lands to local governments and non-profit organizations;
- Donation of easements;
- Establishing historic preservation funds to support specific preservation purposes;
- Construction of museums, cultural centers, and curation facilities;
- Installation and maintenance of interpretive features;
- Public education and outreach programs;
- Intentional and monitored deterioration; and
- Establishing managed open space.

3.5 Air Quality

The proposed Illiana Corridor would result in changes to the physical configuration of the area's roadway network and affect traffic conditions on heavily traveled roadways and congested intersections. Air quality, which is a general term used to describe the pollutant levels in the atmosphere, would be affected by these changes. The purpose of the Tier One DEIS air quality analysis is to determine whether project related traffic conditions would have the potential to result in air quality changes. Site specific impacts, such as microscale analyses, will be evaluated in the Tier Two NEPA studies.

The project's impact on climate change is also addressed in this section as well as mitigation actions recommended to minimize the influence of the project on greenhouse gas (GHG) emissions.

3.5.1 Relevant Air Pollutants for Analysis

The following air pollutants, known as criteria pollutants, have been identified by the US Environmental Protection Agency (USEPA) as being of concern nationwide: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter smaller than 10 microns (PM_{10}), particulate matter smaller than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). Ambient concentrations of CO and O_3 are predominantly influenced by motor vehicle activity; NO_2 is emitted from both mobile and stationary sources; emissions of SO_2 are associated mainly with stationary sources; emissions of particulate matter (PM) are associated with stationary sources, and to a lesser extent, diesel fueled mobile sources (heavy trucks and buses); and Pb emissions, which historically were principally influenced by motor vehicle activity, have been substantially reduced due to the

elimination of Pb from gasoline. Of concern to this project are the pollutants associated with mobile source emissions – CO, O_3, and PM.

CO is a colorless and odorless gas associated primarily with the incomplete combustion of fossil fuels in motor vehicles. CO concentrations can vary greatly over comparatively short distances; relatively high concentrations are typically found near congested intersections, along heavily traveled and congested roadways, and at relatively low elevations. Consequently, it is important and appropriate to predict concentrations of CO on a small area, or "microscale" basis.

Hydrocarbons (HC) and oxides of nitrogen (NO_X) emissions from automotive sources are of concern primarily because of their role as precursors in the formation of O_3 and PM. O_3 is formed through a series of reactions that take place in the atmosphere in the presence of sunlight. Since the reactions are slow and occur as the pollutants diffuse downwind, elevated levels of O_3 are often found many miles from sources of the precursor pollutants. The effects of HC and NO_X are, therefore, generally examined on a regional or "mesoscale" basis.

PM may also be of concern for mobile source projects because of localized emissions related to motor vehicle exhaust and re-entrained dust from tires traveling on paved roads. Potential localized impacts are often evaluated using a qualitative approach developed by USEPA and the FHWA.

3.5.2 National and State Ambient Air Quality Standards

National ambient air quality standards (NAAQS) are concentrations set for each of the criteria pollutants specified by USEPA that have been developed primarily to protect human health. The secondary goal is to protect the nation's welfare and account for the effect of air pollution on soil, water, vegetation, and other aspects of general welfare. For the most part, Illinois and Indiana have adopted the NAAQS as state ambient air quality standards. Timeframes, based on ways that these pollutants adversely impact health, have also been established. These standards, together with their health related averaging periods, are presented in Table 3-50.

3.5.3 Regulatory Setting and Compliance with Standards

The federal Clean Air Act (CAA) defines non-attainment areas as geographic regions that do not meet one or more of the NAAQS. The CAA requires that a State Implementation Plan (SIP) be prepared for each non-attainment area, and a maintenance plan be prepared for each former non-attainment area that subsequently demonstrated compliance with the standards.

Lake and Will counties are currently classified as moderate non-attainment areas for O_3, non-attainment areas for the 1997 $PM_{2.5}$ standard, and attainment for all of the other criteria pollutants. Kankakee County is designated as attainment for all of the criteria pollutants.

Table 3-50. NAAQS

Pollutant	Averaging Period	National Standards[1]	
		Primary	Secondary
CO	8 Hour	9 ppm	None
	1 Hour	35 ppm	None
Pb	Calendar Quarter	0.15 μg/m^3	Same as Primary
NO_2	Annual Average	0.053 ppm	Same as Primary
	1 Hour	0.1 ppm	None
O_3[1]	8 Hour (2008 Standard)	0.075 ppm	Same as Primary
	8 Hour (1997 Standard)	0.08 ppm	Same as Primary
Suspended PM_{10}	24 Hour	150 μg/m^3	Same as Primary
Suspended $PM_{2.5}$	24 Hour	35 μg/m^3	Same as Primary
	Annual Arithmetic Mean	15 μg/m^3	Same as Primary
SO_2	1 Hour	0.075 ppm	-
	3 Hour	--	0.5 ppm

[1] Both standards are currently in effect until 1 year after nonattainment designation has been made under the 2008 standard.
ppm: parts per million.
μg/m^3: micrograms per cubic meter.
Source: USEPA, "National Primary and Secondary Ambient Air Quality Standards" (49 CFR 50).

SIPs define strategies that the states will follow to meet the NAAQS under the deadlines established by the CAA. USEPA's Transportation Conformity Rule requires SIP conformity determinations from proposed transportation plans, programs, and projects before they are approved or adopted. Conformity is defined as compliance with the SIP's strategies to eliminate or reduce the severity and number of NAAQS violations and achieve expeditious attainment of such standards. In addition, federal activities may not cause or contribute to new violations of air quality standards, exacerbate existing violations, or interfere with timely attainment or required interim emissions reductions towards attainment.

The final conformity rule also establishes the process by which the FHWA, the Federal Transit Administration (FTA), and local metropolitan planning organizations (MPOs) determine conformance of highway and transit projects. As part of this process, local MPOs are required under regulations promulgated in the CAA of 1990 to undertake conformity determinations on metropolitan transportation plans (MTPs) and transportation improvement programs (TIPs) before they are adopted, approved, or accepted. TIPs are a subset of staged, multi-year, inter-modal programs of transportation projects covering metropolitan planning areas that are consistent with MTPs. The purpose of the analysis is to develop transportation plans that conform to state or federal air implementation plans with the object being to preserve the public health.

The MPOs for the corridor are the Chicago Metropolitan Agency for Planning (CMAP), the NIRPC and the Kankakee Area Transportation Study (KATS).

- In Illinois, CMAP approved the GO TO 2040 Comprehensive Regional Plan and the 2010-2015 TIP on October 13, 2010, and found that both of these documents conformed to the SIP. KATS adopted their FY2012 TIP in September 2011 and their 2040 Long Range Transportation Plan (LRTP) on May 12, 2010.
- In Indiana, the 2012-2015 TIP was adopted by NIRPC on June 23, 2011 and the 2040 Comprehensive Regional Plan was adopted in July 2011. Both the TIP and the Comprehensive Regional Plan were found to conform to the SIP on July 27, 2011, and the TIP was incorporated into the INDOT Statewide Transportation Improvement Plan (STIP).

3.5.4 Monitored Pollutant Levels

Representative monitored ambient air quality data for the project area are shown in Table 3-51. With the exception of the 8-hour O_3, monitored levels for the criteria pollutants do not exceed national and state ambient air quality standards in the Study Area. Additional air quality information for the study area can be found at http://www.dot.state.il.us/airquality.html.

Table 3-51. Representative Monitored Air Quality Levels (2011)

Pollutant	Location[1]	Averaging Time	Value		NAAQS[2]
CO	East Chicago, Lake County, IN	8 hour	2.3 ppm	2nd highest	9 ppm
		1 hour	3.6 ppm	2nd highest	35 ppm
NO_2	Gary, Lake County, IN	1 hour	0.053 ppm	98th percentile	0.1 ppm
O_3	Hammond, Lake County, IN	8 hour	0.084 ppm[3]	4th highest	0.075 ppm
$PM_{2.5}$	Gary, Lake County, IN	Annual	13.4 µg/m³	mean	15 µg/m³
		24 hour	28 µg/m³	98th percentile	35 µg/m³
PM_{10}	Gary, Lake County, IN.	24 hour	51 µg/m³	4th highest	150 µg/m³

[1] When multiple monitoring sites are located in or near the study, the data from the monitor with the highest recorded values are provided.
[2] Values shown correspond to NAAQS time periods.
[3] Exceeds the NAAQS.
ppm: parts per million.
µg/m³: micrograms per cubic meter.
Source: EPA Office of Air Quality Planning and Standards (AIRSData); http://www.epa.gov/airdata/.

3.5.5 Air Quality Conformity

The Illiana Corridor is not currently included as part of the 2040 MTPs for CMAP or NIRPC, as a fiscally constrained and conformed project. However, ongoing planning efforts are being considered for these regional plans and, along with the prior planning efforts described in Section 1.0 of this document, prompted initiation of the current Tier One DEIS. On this basis, the long range need for additional vehicle capacity has been acknowledged. Prior to approval of a Tier Two Record of Decision, the preferred alternative(s) must be included in the fiscally constrained portion of the MTPs and regional conformity demonstrated.

Conformity requirements do not apply to the Tier One analysis because it is a planning level study that would not directly involve construction or physical impacts and there would be no generation of pollutants that would substantially impact air quality. The federal regulations pertaining to this issue are contained in 40 CFR 93.126, which lists projects that are exempt from air quality conformity. These include specific activities that do not involve or lead directly to construction, such as planning and technical studies. During the Tier Two NEPA studies, transportation conformity would be addressed including: (1) confirmation of the date and status of the Regional Transportation Plan (RTP) conformity; (2) a $PM_{2.5}$ hotspot analysis to estimate the future localized PM concentrations and assess potential standard violations; and (3) a discussion of whether the Tier Two preferred alternative(s) would implement a Transportation Control Measure (TCM) in the applicable air quality plan, and if not, a determination as to whether the Tier Two preferred alternative(s) would interfere with implementing TCMs. Because conformity is a Tier Two NEPA issue, it is not discussed further in this Tier One document.

3.5.6 Potential Project Impacts and Analyses to be Conducted

Air quality analyses will be conducted in accordance with Illinois and Indiana guidance to determine compliance with NEPA and Conformity requirements. Microscale CO, MSATs, and greenhouse gas analyses will be conducted for NEPA compliance purposes; the $PM_{2.5}$ analysis will be conducted to demonstrate compliance with the USEPA's Transportation Conformity Rule.

3.5.6.1 Criteria Pollutants

Microscale Air Quality Analysis for Carbon Monoxide (CO)

Based on the traffic data that will be provided for both the No-Action Alternative and working alignments, analyses will be conducted during the Tier Two NEPA studies to determine whether the project has the potential to impact localized air quality levels.

- For analysis sites in Illinois, the IDOT's intersection screening model "Illinois Carbon Monoxide Screen for Intersection Modeling" (COSIM) will be used to address the worst case CO concentrations at nearby sensitive land uses.
- For analysis sites in Indiana, procedures provided in the INDOT Procedural Manual for Preparing Environmental Documents and INDOT's Categorical Exclusion Manual will be used.

Particulate Matter (PM) Analysis

A $PM_{2.5}$ assessment will be conducted for this project during the Tier Two NEPA studies. As this will occur after December 20, 2012, analyses would be conducted in accordance with procedures specified in www.epa.gov/fedrgstr/EPS-AIR/2006/March/Day-10/a2178.htm. A determination will be made, based on the EPA regulations and consultation with the inter agency group, as to whether or not this project is determined to be a "project of air quality concern." If it is, a quantitative analysis will be conducted.

Regional Ozone Analysis

It is anticipated that the selected alternative(s) in Tier Two would be included in both the Illinois and Indiana TIPs. As such, regional conformity will be evaluated in the States' respective planning processes. The selected alternative must be included in the regional conformity analyses prior to FHWA being able to issue a ROD.

3.5.6.2 Mobile Source Air Toxics (MSATs)

In addition to determining criteria for air pollutants for which there are NAAQS, the USEPA also regulates air toxics. Mobile source air toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. 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 result from engine wear or from impurities in oil or gasoline. FHWA's "Interim Guidance Update on Mobile Source Air Toxics Analyses in NEPA" suggests a tiered approach for addressing MSATs in NEPA documents.

The MSATs and associated analysis for this project will be addressed during the Tier Two NEPA studies. The level of analysis to be conducted will be based on FHWA's most current MSATs guidance.

3.5.6.3 Climate Change

Introduction

Climate change is emerging as an important national and global concern. While the earth has gone through many natural changes in climate in its history, there is general agreement that the earth's climate is exhibiting various changes of different degrees at various rates and will continue to do so for the foreseeable future. Anthropogenic (human caused) GHG emissions contribute to this rapid change. Carbon dioxide (CO_2) makes up the largest component of these GHG emissions. Other prominent transportation GHGs includes methane (CH_4) and nitrous oxide (N_2O).

Many GHGs occur naturally. Water vapor is the most abundant GHG and makes up approximately two thirds of the natural greenhouse effect. However, the burning of fossil fuels and other human activities are adding to the concentration of GHGs in the atmosphere. Many GHGs remain in the atmosphere for time periods ranging from decades to centuries. GHGs trap heat in the earth's atmosphere. Because atmospheric concentration of GHGs continues to climb, our planet will continue to experience climate

related phenomena. For example, warmer global temperatures can cause changes in precipitation, evapotranspiration, and changes in sea levels.

To date, no national standards have been established regarding GHGs, nor has USEPA established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO_2 under the CAA. However, there is a considerable body of scientific literature addressing the sources of GHG emissions and their potential adverse impacts on climate, including reports from the Intergovernmental Panel on Climate Change, the US National Academy of Sciences, and USEPA and other federal agencies. GHGs are different from other air pollutants evaluated in federal environmental reviews because their impacts are not localized or regional due to their rapid dispersion into the global atmosphere. The impacted environment for CO_2 and other GHG emissions is the entire planet. In addition, from a quantitative perspective, global climate change is the cumulative result of numerous and varied emissions sources (in terms of both absolute numbers and types), each of which makes a relatively small addition to global atmospheric GHG concentrations.

The transportation sector is the second largest source of total GHG emissions in the US behind electricity generation. The transportation sector was responsible for approximately 27 percent of all anthropogenic (human caused) GHG emissions in the US in 2009.[8] The majority of transportation GHG emissions are the result of fossil fuel combustion. CO_2 makes up the largest component of these GHG emissions. US CO_2 emissions from the consumption of energy accounted for about 18 percent of worldwide energy consumption CO_2 emissions in 2009.[9] US transportation CO_2 emissions accounted for about 6 percent of worldwide CO_2 emissions.[10]

Analyses to be Conducted

Under NEPA, detailed environmental analysis should be focused on issues that are significant and meaningful to decision making.[11] Changes in GHG emission rates associated with the proposed action will be estimated in the Tier Two NEPA studies.

Even though project level mitigation measures would not have a substantial impact on global GHG emissions because of the exceedingly small amount of GHG emissions involved, the following measures during construction would have the impact of reducing GHG emissions. To minimize GHG emissions related to project construction, the following measures can be considered for implementation:

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[8] Calculated from data in US Environmental Protection Agency, Inventory of Greenhouse Gas Emissions and Sinks, 1990-2009.

[9] Calculated from data in US Energy Information Administration International Energy Statistics, Total Carbon Dioxide Emissions from the Consumption of Energy, http://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=90&pid=44&aid=8, accessed 9/12/11.

[10] Calculated from data in EIA figure 104: http://205.254.135.7/oiaf/1605/ggrpt/carbon.html
And
EPA table ES-3: http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-ES.pdf

[11] See 40 CFR 1500.1(b), 1500.2(b), 1500.4(g), and 1501.7.

- Adhere to construction practices that encourage efficient energy use, such a limiting idling equipment and designating staging areas near work sites.
- Encourage carpooling for workers to the project site.
- Purchase construction materials from local suppliers to minimize long-distance hauling.
- Promote regular vehicle and equipment maintenance to improve efficiency.
- Optimize construction schedules and methods.
- Increase the use of fuel efficient vehicles in the construction fleet.

Conservation of energy, and reduction of GHG emissions, could also be achieved in facility operations, particularly through the selection of energy efficient features during the design phase. GHG mitigation measures will be further evaluated/refined in the Tier Two NEPA studies.

GHG Summary

This Tier One DEIS does not incorporate an analysis of the GHG emissions or climate change impacts of the working alignments. FHWA is working to develop strategies to reduce transportation's contribution to GHGs—particularly CO_2 emissions—and to assess the risks to transportation systems and services from climate change. FHWA will continue to pursue efforts as productive steps to address this important issue. Finally, the construction best practices described above represent practicable project level measures that may help reduce GHG emissions on an incremental basis and could contribute in the long term to meaningful cumulative reduction when considered across the Federal-aid highway program.

3.6 Noise

The following section describes the existing noise sensitive land uses within the corridors, provides a summary of FHWA, IDOT, and INDOT noise policies, and identifies the methodologies used to analyze potential noise impacts as part of the Tier Two NEPA studies. The Tier Two NEPA studies will predict and identify traffic noise impacts, conduct a feasibility and reasonableness evaluation, and consider noise abatement, as necessary.

3.6.1 Criteria

Illinois and Indiana traffic noise policies for the portions of the project in their respective state will be used. These state policies follow FHWA regulations as defined by 23 CFR 772.

3.6.1.1 FHWA Noise Abatement Criteria (NAC)

FHWA's Noise Abatement Criteria (NAC) uses seven land use categories to assess potential traffic noise impacts. FHWA states that a traffic noise impact occurs when the predicted traffic noise levels for a proposed project approach or exceed the NAC criteria for land use activity categories shown in Table 3-52, or when there is a substantial increase in the traffic noise level. FHWA does not define "approach" or a "substantial" noise increase. As detailed