

- Adhere to construction practices that encourage efficient energy use, such as 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 CO₂ 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

Table 3-52. FHWA NAC

Activity Category ¹	Leq(h) ² dB(A)	Evaluation Locations	Description of Activity Category
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ¹	67	Exterior	Residential.
C ¹	67	Exterior	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E ¹	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	-	-	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	-	-	Undeveloped lands that are not permitted

¹ Includes undeveloped lands permitted for this activity category.

² The 1 hour equivalent noise level. The 1 hour noise level of steady sound that has the same sound energy as the 1 hour varying sound.

Source: IDOT (Highway Traffic Noise Assessment Manual 2011)

below, each state’s traffic noise policy is required to define what levels are considered “approaching” the NAC, and what levels are considered a “substantial” increase.

3.6.1.2 Illinois

The IDOT Noise Policy (2011) establishes the traffic noise analysis requirements for all Type I projects whether they are federally funded or state only funded. The IDOT Noise Policy uses the same land use categories established in the FHWA NAC and has defined a traffic noise impact as:

- Design year (typically 20 years into the future) traffic noise levels predicted to approach, meet, or exceed the NAC, with approach defined as 1 A-weighted decibel (dB(A)) less than the NAC; or
- Design year (typically 20 years into the future) traffic noise levels are predicted to substantially increase (greater than 14 dB(A)) over the existing noise levels.
- The IDOT Noise Policy can be found at www.dot.state.il.us/desenv/noise.html.

The IDOT *Highway Traffic Noise Assessment Manual (2011)* suggests an initial screening of sensitive receptors by reviewing land uses within 500-feet of the proposed roadway improvement. If there are sensitive receptors further than 500-feet from the roadway, these should be considered and could be included on a case-by-case basis in the traffic noise analysis, dependent upon the sensitivity of the receptor (e.g., nursing home).

3.6.1.3 Indiana

The INDOT Noise Policy (2011) follows the FHWA NAC and has defined a traffic noise impact as:

- Approach to be within 1 dB(A) of the appropriate noise abatement category; or
- Substantial noise increase is an increase in which future noise levels exceed the existing noise levels by 15 dB(A).
- The INDOT Noise Policy can be found at http://www.in.gov/indot/files/INDOT_Noise_Policy_June_2011.pdf.

To determine potential traffic noise impacts, INDOT Noise Policy states that land use activity categories for receptors within 500-feet of the edge of the outside travel lane be identified. If there is reason to believe that potential traffic noise impacts could occur at a distance greater than 500-feet, then the noise analysis can be extended to 800-feet, which is the limit of accuracy for the FHWA Traffic Noise Model (Version 2.5).

3.6.2 Methodology for Assessing Noise Levels

Noise modeling to determine existing and design year (working alignments and the No-Action Alternative) traffic noise levels at noise sensitive receivers was not undertaken during the Tier One NEPA study; it will be completed during the Tier Two NEPA studies.

Based on the existing land use characteristics of the corridors, the common outdoor sound levels were estimated to be between 30 to 40 dB(A) based on quiet suburban areas (Table 1-3 in IDOT *Highway Traffic Noise Assessment Manual*). Regardless of existing noise levels, receptors may have traffic noise impacts as a result of a substantial increase between the existing and future build noise levels. Traffic noise impacts will be evaluated during the Tier Two NEPA studies.

3.6.3 Potential Sensitive Land Uses

Areas of potential sensitive land uses were estimated using the total number of acres of potential land use activities that exist within each corridor. The number of acres was estimated for each land use activity category. This was done using secondary source data that provided both the most recent available land use data and aerial photography. Currently available land use data was used to identify residential areas, and the most recent available aerial photography was used to identify home/structure locations in the areas designated as agricultural land uses.

There are no known or identified Activity Category A lands within the corridors. Examples of Activity Category A are the Tomb of the Unknown Soldier, a monastery, or an outdoor amphitheater. The FHWA must approve a land use as Activity Category A before a traffic noise analysis on an Activity Category A is initiated. The estimated total number of acres within the corridors for Activity Categories B, C, and E are shown in Table 3-53. Activity Category D is used if there is no outside area of frequent human activity or where noise abatement is not feasible or reasonable. Activity Category D land use will be identified and addressed, if applicable, in the Tier Two NEPA studies. Activity Category F includes developed lands that are not sensitive to highway traffic noise. These land uses do not have an associated NAC and do not require analysis of noise impacts. These land uses will be documented in the Tier Two NEPA studies. Undeveloped lands will also be evaluated in the Tier Two NEPA studies to determine whether they are permitted for development. Undeveloped lands that are not permitted are Activity Category G. Highway traffic noise levels will be determined for these lands, and this information will be provided to local officials. Undeveloped lands that are permitted for development will be evaluated based on permitted future land use.

Table 3-53. Traffic Noise Sensitive Land Uses by Corridor¹

Location	Acres of FHWA Activity Category B	Acres of FHWA Activity Category C	Acres of FHWA Activity Category E
Corridor A3S2			
Illinois	1,854	0	7
Indiana	921	362	0
Total	2,775	362	7
Corridor B3			
Illinois	830	5	7
Indiana	921	362	0
Total	1,751	367	7
Corridor B4			
Illinois	795	6	13
Indiana	88	0	0
Total	883	6	13

¹ All values are estimates secured through secondary sources.

3.6.3.1 Corridor A3S2

In Corridor A3S2 there would be an estimated 2,775 acres of residential land uses. In general, residential uses are scattered across the corridor on large farms. The largest concentration of residential areas occurs south of Monee, Illinois, where the working alignment for Corridor A3S2 crosses Bruns Road, I-57, Governors Highway and Will Center Road. Single family home subdivisions, with approximately 120 homes, comprise 495 acres of Activity Category B in this area.

There are 362 acres of Activity Category C within the Corridor A3S2; all 362 acres are located in Lake County. The land uses in the 362 acres are designated as park, open space, and recreation. Based on aerial photography, it is estimated that the 362 acres consist of open space without any formal areas of parkland or recreation facilities.

All 7 acres of Activity Category E are located in Will County between I-57 and IL-394.

3.6.3.2 Corridor B3

Within Corridor B3 there would be an estimated 1,751 acres of residential land uses. The residential uses are on large farms, with only a few scattered single family residences. The majority of the residential areas occur in Wilmington, Illinois, between South Riley Road and I-55. Single family home subdivisions, with approximately 100 homes, comprise 235 acres of Activity Category B in this area.

There are 367 acres of Activity Category C within Corridor B3, of which 362 acres are located in Lake County. The 5 acres of Activity Category C in Will County are located between Drecksler Road and South Egyptian Trail. Based on aerial photography, the area includes some structures and activity centers, but most of the area is agricultural land. It is estimated that the 362 acres in Lake County consist of open space without any formal areas of parkland or recreation facilities.

All 7 acres of Activity Category E are located in Will County at the intersection of New River Road and IL-53.

3.6.3.3 Corridor B4

Within Corridor B4 there would be an estimated 883 acres of residential land uses; 795 acres in Will County and 88 acres in Lake County. The residential uses are on large agricultural estates, with only a few residences located within the corridor. The majority of the residential areas are in Wilmington, Illinois, between South Riley Road and I-55. Single family home subdivisions, with approximately 100 homes, comprise 235 acres of Activity Category B in this area.

The 6 acres of Activity Category C in Will County are located between Drecksler Road and South Egyptian Trail. Based on aerial photography, the area includes some structures and activity centers, but most of the area is agricultural land.

All 13 acres of Activity Category E are located in Will County. Seven acres of the 13 acres are located at the intersection of New River Road and IL-53. The remaining 6 acres are located along IL-50 near Peotone, Illinois.

Since the proposed project is a Type I project, construction of a highway on a new location, a traffic noise study will be conducted during the Tier Two NEPA studies. In the Tier Two NEPA studies, the traffic noise analysis will follow the IDOT and INDOT Noise policies. The analysis will address and identify traffic noise impacts, conduct feasibility and reasonableness evaluations, undertake consideration of traffic noise abatement measures for traffic noise impacts, and future traffic noise levels for

undeveloped lands will be predicted to assist local agencies with assessing future land use compatibility with the project alternatives.

3.6.4 Construction Noise

Trucks and machinery used for construction produce noise which may impact some land uses and activities during the construction period. At some time, residents along the alignment would experience perceptible construction noise from implementation of the proposed project. To minimize or eliminate the impact of construction noise on these receptors, mitigation measures have been incorporated into the IDOT's *Standard Specifications for Road and Bridge Construction* as Article 107.35(2012). For construction noise, the INDOT Noise Policy states, "INDOT will be sensitive to local needs and may make adjustments to work practices in order to reduce inconvenience to the public."

3.6.5 Traffic Noise Abatement Measures

A comprehensive traffic noise impact analysis will be conducted as part of the Tier Two NEPA studies. This analysis will identify traffic noise impacts and evaluate the feasibility and reasonableness of abatement measures using the FHWA Traffic Noise Model. At a minimum, noise abatement in the form of noise barriers shall be considered. Barriers tall enough to break the line of sight from the noise source to the receptor usually are capable of achieving a 5 dB(A) reduction in traffic noise levels. Alternative abatement measures could include earth berms, traffic management measures (traffic control, time use restrictions for certain vehicle types, modified speed limits, etc.), alteration of horizontal and vertical alignments, and acquisition of real property to serve as a buffer zone.

Traffic noise abatement measures must be feasible and reasonable, and will be evaluated under the IDOT and INDOT policies accordingly.

The Tier Two NEPA studies will also address construction noise and vibration. Because construction noise and vibration varies greatly depending on the equipment being used, the need for a construction noise and vibration analysis, and potential monitoring, will be evaluated on a case-by-case basis.

3.6.6 Coordination

In the Tier Two NEPA studies, in accordance with respective state policies, if barriers are found to be feasible and reasonable the views of the benefited receptors will be sought. Preliminary design details of the likely abatement measures will be discussed at public meetings and hearings, and local officials will be furnished the appropriate information pertaining to undeveloped lands within the project limits.

3.7 Energy

Direct and indirect energy is expended for transportation facilities. Direct energy is consumed in the operation of vehicles and maintenance of transportation facilities. Indirect energy use includes energy consumed during construction of a project and changes in vehicle travel patterns near a construction area. Energy consumption by